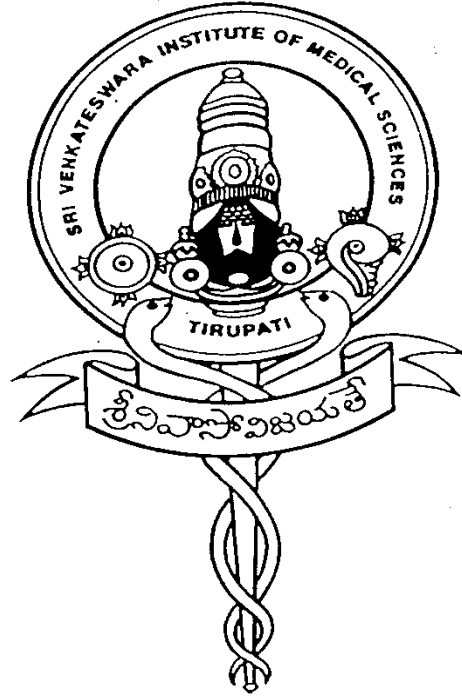


**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI – 517 507**



**M.D. - ANAESTHESIOLOGY  
COMMON BOARD OF STUDIES MEETING**

***Dt.: 21.07.2021***

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**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUAPATI**

**M.D. (ANAESTHESIOLOGY)**

**COMMON BOARD OF STUDIES MEETING ON 21.07.2021**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**

**M.D (ANAESTHESIOLOGY)**

**COMMON BOARD OF STUDIES MEETING ON 21.07.2021**

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SVIMS, Tirupati

**GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING  
PROGRAMME FOR M.D., IN ANAESTHESIOLOGY**

(As prescribed by MCI, 2018)

**I. PREAMBLE**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. The goals are

1. A post graduate specialist having undergone the required training in anaesthesiology should be able to recognize the health needs of the community.
2. He or she should be competent to handle effectively medical problems and should be aware of the recent advances pertaining to his/her specialty.
3. She/he should be highly competent anaesthesiologist with broad range of skills that will enable him/her to practice anaesthesiology independently.
4. He or she should be competent to manage critically ill patients in emergency and ICU requiring routine to advanced monitoring, mechanical ventilation and other interventions.
5. The PG student should also acquire the basic skills in teaching of medical/para-medical/ Allied health sciences students.
6. She/he is also expected to know the principles of research methodology and modes of consulting library.
7. She/he should attend conferences, workshops and CMEs regularly to upgrade his/her knowledge.
8. Demonstrate aptitude and will to remain clear headed and act correctly when faced with critical incidence in the operating room and critical care units.
9. Demonstrate the knowledge of ethics and medico legal aspects related to the practice of anaesthesiology and critical care.
10. She / he should have dedication to the specialty, to patients under his care, to the institution and be able to work as a team with surgeons, nursing staff, hospital administration and with other clinicians, understanding, adjusting and instructing where necessary with a balanced mind and leadership qualities.

**II. REGULATIONS:**

- a) **Eligibility for admission:** A candidate seeking admission into the course shall have MCI / NMC recognized MBBS qualification.
- b) **Admission:** In order to be **eligible** for admission to any postgraduate course in a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in '**National Eligibility-cum- Entrance Test for Postgraduate courses**' held for the said academic year.
- c) **All the students should get their degree registered with AP state medical council before completion of first semester.**

**d) Duration of the course:** The duration of the course shall be three calendar years (including the period of examination).

**e) Bond:**

i) The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/- value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. **5,00,000/- (Rupees Five Lakhs only)** along with the full stipend amount received by him/her back to the Institute.

ii) The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.20,00,000 (Rupees Twenty lakhs only).

**f) Training Programme:** The candidate joining the course must work as full time Resident during the period of Post Graduate Training.

**Note:** In-Service candidate will not be paid stipend if He / She draws leave salary in that parent institution.

**g) External training:** The residents are permitted for external posting during the training period on payment of stipend for a period not exceeding one month as per the need and on recommendation of the HoD. The request for such training shall be submitted to the Dean, SVIMS through proper channel, two months in advance in order to process with the institution where the posting is required. The expenditure towards travel, accommodation and fees shall be borne by the individual.

**g) Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

**h) Attendance:** All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80%

(Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

**i) DISTRICT RESIDENCY PROGRAMME (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as “**District Residency Programme (DRP)**” and the postgraduate medical student undergoing training shall be termed as a “**District Resident**”.

**III. SUBJECT SPECIFIC OBJECTIVES**

1. **Theoretical knowledge:** A student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to his speciality. He/she should acquire in-depth knowledge of his subject including recent advances. He should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.
2. **Clinical / Practical skills:** A student should be expert in good history taking, physical examination, providing basic life support and advanced cardiac life support, common procedures like FNAC, Biopsy, aspiration from serous cavities, lumbar puncture etc. He/she should be able to choose the required investigations.
3. **Research:** He/she should know the basic concepts of research methodology plan a research project and should know how to consult library. Basic knowledge of statistics is also required.

**IV. SUBJECT SPECIFIC COMPETENCIES**

The student during the training programme should acquire the following competencies:

**1. Cognitive domain**

- Demonstrate knowledge of Anatomy related to;
  - Diaphragm, upper and lower airway, heart and coronary circulation ,
  - Regional anaesthesia - field block, central neuraxial, blockade, block for acute pain states
  - Procedures like -Intramuscular injections, arterial and venous cannulations and

➤ Patient Positioning under anaesthesia

- Demonstrate knowledge of Physiology of various systems (respiratory, cardiovascular, hepatobiliary, renal, endocrine, pregnancy, haematological, neuromuscular, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP, central, autonomic and peripheral nervous systems, metabolic response to stress and trauma) in detail and translate its application in a problem solving manner.
- Demonstrate knowledge of Biochemistry relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.
- Demonstrate knowledge of commonly used drugs in anaesthesia practice (premedication, induction agents - intra-venous and inhalational, neuromuscular blocking agents and reversal of muscle relaxants) - general principles, concepts of pharmacokinetics and pharmacodynamics, drug interactions with the other drugs taken concomitantly by the patient and anaphylactoid reactions.
- Demonstrate knowledge of gas laws, medical gas supply system, fluidics, electricity, diathermy and oxygen therapy.
- Demonstrate knowledge of 'principles of physics' that govern functions of basic anaesthesia delivery equipment, airway devices - (laryngoscopes, airways etc), breathing systems and monitors, fiber optics, Lasers, Pacemakers and defibrillators, monitoring equipments (used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block), Sterilization of equipments, manufacture, filling and transport of gases and liquid oxygen. etc.
- Demonstrate knowledge of importance of pre-anaesthetic assessment and optimization of a patient; consisting of evaluation, interpretation of laboratory investigation as applied to the care of the patients in planning and conduct of general anaesthesia.
- Demonstrate knowledge of basic life support, advanced cardiac, trauma life support, and neonatal resuscitation according to latest guidelines.
- Demonstrate knowledge of principles of sterilization and universal precautions, selection, maintenance and sterilization of anaesthesia and related equipment, Infection control, cross contamination in OT and ICU.
- Immune response and anaesthesia.
- Describe the development and history of anaesthesia as a specialty with knowledge of important personalities who have contributed towards it.

- Demonstrate knowledge of principles of artificial ventilation, management of unconscious patients, oxygen therapy, shock- (pathophysiology and management) and various protocols related to Intensive Care Unit.
- Demonstrate knowledge of post-operative care in the post-anaesthesia recovery room, in terms of management of
  - Post-operative pain: various modalities
  - Nausea and vomiting
  - Identified emergencies and postoperative complications.
  - Special precautions to be taken in specific surgical patients.
- Demonstrate knowledge of acute pain management, chronic pain therapy & therapeutic nerve blocks, acupuncture, acupressure and other non-conventional methods of treatment.
- Describe documentation, medico-legal aspects of anaesthesia and concept of informed consent.
- Demonstrate knowledge of research methodology and basics of biostatistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.
- Demonstrate ability to interpret blood gas analysis and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
- Explain blood coagulation mechanism, and their disturbances, rational use of blood and blood components.
- Demonstrate knowledge pertaining to special anaesthetic techniques as relevant to:
  - Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
  - Associated medical disorders in surgical patients
  - Geriatric and pediatric anaesthesia, Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
  - Induced hypothermia, incidental, and environmental safety of patient.
  - Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
  - Principles of anaesthetic management of neuro/ cardiac/thoracic /vascular/ transplantation/burns and plastic surgery.
  - Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
  - Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator, Multiple organ failure



- Demonstrate knowledge pertaining to care of terminally ill, Hospices management, Do not resuscitate orders.
- Demonstrate knowledge of general principles of medical audit and Critical incident reporting.
- Demonstrate knowledge of Ethics and clinical trial.
- Demonstrate knowledge of Hospital, ICU and OT design and planning.
- Demonstrate knowledge of Medical education including evidence based medical education.
- Demonstrate knowledge of principles of human resources and material management.

## **2. Affective Domain:**

- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

## **3. Psychomotor domain**

At the end of the course, the student should acquire skills in the following broad areas and be able to:

- Demonstrate ability as a peri operative physician, in terms of
  - Acquiring mastery in careful and relevant history taking, physical examination in clinical evaluation of the patient preoperatively.
  - Collecting and synthesizing preoperative data from parent hospital and other sources and to develop a rational strategy for the peri-operative care of the patient.
  - Thorough and systematic approach to preoperative evaluation of patients with and without systemic diseases, undergoing different types of operations.
  - Prioritizing problems, present cases clearly and systematically to attending consultants.
  - Developing working relationships with consultants in other specialties to assist in preoperative evaluation and get a good consultation.

- Interacting with preoperative patients and developing effective counselling techniques for different anaesthetic techniques and peri-operative procedures.
  - Assessing and explaining risk of procedure and taking informed consent.
  - Managing information in preoperative evaluation and outcome enhancement and communication skill to patients and relatives.
  - Ability to choose and order the required investigations to be done in a particular patient peri operatively
- Demonstrate ability in performing
    - Pre-operative equipment check
    - selection of drugs
    - Preparation of work table etc.
- Identify conditions like difficult airway by following difficult airway algorithms.
  - Demonstrate ability to establish topical airway anaesthesia for awake intubation
  - Demonstrate management of a Failed intubation drill on a Mannequin according to latest guidelines
  - Demonstrate ability to monitor and assess depth of anaesthesia
  - Demonstrate abilities to manage body fluid composition; volume status; replacement of fluid and blood loss; use of whole blood and blood components.
  - Demonstrate abilities to manage Electrolyte and acid base derangements; osmolarity and osmolality.
  - Demonstrate acquisition of skills to initiate mechanical ventilation; select appropriate type and mode of ventilator; and monitor proper functioning of ventilator.
  - Identify the need to perform intra-operative laboratory tests, blood gases, coagulation profile and interpret the results with clinical co relation
  - Demonstrate ability to manage co-morbid conditions and anaesthesia
  - Demonstrate ability to perform cannulation of arteries, central and peripheral veins.
  - Demonstrate ability in using and interpreting the following routine non-invasive and invasive monitors intra-operatively:
    - Electrocardiogram with ST-segment analysis
    - Noninvasive blood pressure
    - Capnograph: values and changes in values and waveform.
    - Pulse oximetry: values and changes in values

- Neuromuscular blockade monitor
- Invasive arterial pressure: waveform and changes in the waveform
- Central venous pressure: values and waveform
- Pulmonary artery pressure: Values and waveforms, pulmonary capillary wedge tracing.
  - Cardiac output
  - Mixed venous oxygen saturation
  - Evoked potential
  - Transesophageal echocardiography: basic understanding
- Demonstrate skills in providing basic life support, advanced cardiac life support, trauma life support and paediatric-neonatal life support, train medical and paramedical staff in BLS and ALS.
- Demonstrate mastery in common procedures like vascular access, use of latest invasive and non-invasive monitoring equipment, lumbar puncture, management of appropriate mechanical ventilation and total care of Intensive Care Patient.
- Demonstrate ability to administer general anaesthesia and regional anaesthesia for ASA I to V, under supervision.
- Demonstrate ability to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision.
- Demonstrate ability to use ultrasound machine for giving blocks and venous cannulation.
- Demonstrate ability to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery, and for all major surgeries, able to manage critically ill patients and treat intractable pain.
- Demonstrate following abilities in **Emergency Anaesthesia, Trauma and Resuscitation:**
  - Organize resources in case of mass casualty.
  - Perform triage.
  - Assess, transport and manage mass casualties / disaster management and camp anaesthesia.
  - Manage massive haemorrhage and massive blood transfusion.
  - Transport critically ill patient.
  - Perform anaesthetic management of geriatric patients with fracture neck of femur
  - Manage severe burns patients, rapidly progressing spinal compression, massive haemoptysis and lobectomy, peritonitis from various suspected causes, preparation and management of bowel obstruction, septicaemic shock, acute upper airway obstruction such as foreign body, epiglottitis, infections, cardiac tamponade from examples

- post cardiac surgery, malignant pericardial effusion, peri-operative management of rupture aneurysm of abdominal aorta
- Basic Cardiac Life Support and Advanced Cardiac Life Support, Basic Trauma Life Support, Advanced Trauma Life Support, and Cerebral preservation.
  - Management of intra-operative cardiac arrest
  - Management of intra-operative bronchospasm
- Demonstrate ability to document a Medico-legal aspect.
  - Demonstrate ability to provide special sedation /anaesthesia requirements outside operating Room, eg Radiology: for CT, MRI (especially in relation to dye allergy and embolization, Oncho radiotherapy, Electroconvulsive shock therapy (modified ECT. Non-invasive cardio-radiologic procedures including balloon angioplasty and cardiac catheterization, Non-invasive neuro-radiologic procedures, lithotripsy etc .
  - Demonstrate ability to analyze data and write a thesis, present scientific data, participate in anaesthesia audit.
  - Demonstrate ability to critically review and acquire relevant knowledge from the journals about the new development in the specialty
  - Demonstrate following abilities in the **Post Anaesthesia Care Unit (PACU)/recovery room**
    - Assess the patient's recovery and condition for a safe discharge or transfer.
    - Observe, recognize and treat the commonly occurring problems likely to arise in the Post-anaesthesia Care Unit (PACU) especially those in relation to cardio-respiratory systems:
      - Airway integrity and compromise.
      - Arrhythmia
      - Hypertension
      - Hypotension
      - Pain prevention and pain relief
      - Nausea and vomiting
      - Decreased urine output
      - Emergence delirium
      - Delayed emergence from anaesthesia
      - Shivering
      - Post-obstructive pulmonary edema.
    - Assess patient recovery and the parameters for transfer from the PACU to the ward, ICU, home.
    - Score the patient's condition according to the Aldrete system, including fast tracking after out-patient surgery.

- Demonstration of following abilities in **Intensive Care Unit**
  - Understanding the spectrum of critical illnesses requiring admission to ICU.
  - Recognizing the critically ill patient who needs intensive care -Trauma, burns, all types of shock, Sepsis, SIRS and ARDS, Poisoning, infectious patient (HIV, Hepatitis) and patients with metabolic disturbances.
  - Monitoring progress of patients by physiological scoring systems
  - Practicing infection control practices and control of nosocomial infections.
  - Inserting central venous lines, arterial lines using ultrasound and interpreting the data.
  - Managing cardiovascular instability, respiratory failure and postoperative pulmonary complications
  - Understanding of the operation of mechanical ventilators including different ventilatory modalities non-invasive ventilation, complications and modes of weaning.
  - Principles and application of Oxygen Therapy
  - Glycaemia control in the critically ill patient
  - Practice of Hypothermia and prevention of cerebral injury after cardiac arrest
  - Delivering appropriate nutritional support - enteral and parenteral.
  - Proper use of sedative/hypnotic drugs in the ICU.
  - Practicing ethical and legal aspects of critical care
  - Good communication skills with patient and relatives.
  - Proper Sterilization of ICU equipment.
  
- Demonstration of following abilities in **Acute pain and Chronic Pain Management**
  - Assessment of patients with pain including: history taking, physical examination, and interpretation of investigations.
  - Classify types of pain - acute chronic, traumatic, cancer pain, etc. with the knowledge of Pain pathways in detail.
  - Practice the different modalities of physical therapy that may relieve both acute and chronic pain
  - Practice the acute pain, cancer pain guidelines and WHO treatment ladder.
  - Practice routes of administration and risk/benefits of drugs used for acute and chronic pain relief, patient controlled analgesia and treat the common pain syndromes.
  - Demonstrate practice of pain management in patients with problem drug use, drug dependency and addiction and identify the parameters for referral to a pain medicine specialist.

- Demonstrate Organization of acute pain service and role of acute pain nurse for pain assessment in various groups of patients, Physiological changes secondary to Pain, practice different modalities of pain control. Pharmacology and side effects of opioid analgesia and non-opioid analgesia, principle of patient-controlled analgesia and assessment of its efficacy, Pharmacology and side effects of epidural/intra-thecal opioid. Neurological assessment of epidural blockade and management of failed block. Management of regional blockade - brachial plexus, para-vertebral and intra-pleural block. Management of epidural abscess.
- Substance abuse and acute pain control. Pain control in concurrent medical diseases - COAD, IHD, bleeding tendency, geriatric. Pain control in burns patients. Pain control in trauma patients included multiple rib fracture
- Demonstration of abilities to manage Chronic Pain(Peripheral posting)
  - Practice different modalities of chronic pain management - physical therapy, psychotherapy, (including cognitive behavioural approaches), neuroablation, neuro-augmentation, spinal opioid, interventional neuro-blockade, non-opioid analgesia.
  - Anatomy, indication, technique and complication of chemical sympathectomy (lumbar sympathectomy, stellate ganglion block, celiac plexus block).( Peripheral posting)
  - Practice principles of management of cancer pain, principle of management of non-cancer neuropathic pain - phantom limb pain, post-herpetic neuralgia, complex regional pain syndrome, trigeminal neuralgia. Principle of management of non-cancer nociceptive pain - myofascial pain, lowerback pain, intractable angina, burns, chronic pancreatitis, PVD.
  - Practice Epidural steroid injection (all levels) and long-term epidural catheterization.
  - Observe and practice following blocks: Infra-orbital nerve, Intercostals nerve
  - Recognize complications associated with each blocks and know appropriate treatment of each
  - Know the indications for stimulation techniques such as transcutaneous electrical nerve stimulation (TENS), dorsal column stimulation, and deep brain stimulation. ( Peripheral posting)
  - Mechanisms and side effects of other therapies used for treating pain.
  - The principles of pain management in special patient groups including the elderly, children, disabled, intellectually handicapped and those unable to communicate.
  - Awareness of the principles for insertion and management of implantable drug delivery pumps. ( Peripheral posting)
  - Awareness of the basic principles of palliative care. ( Peripheral posting)
- Demonstrate practice of **Regional Anaesthesia**

- Applying general principles of pharmacology of local anaesthetics and various adjuvants.
  - Familiarizing with the relevant anatomy for regional techniques.
  - Application of indications and contraindications to regional anesthetic technique including central neuraxial blocks, peripheral nerve blocks and sympathetic nerve blocks.
  - Assessing adequacy of regional anaesthesia, and learn techniques of supplementation of inadequate blocks.
  - Providing effective anxiolytics and sedation of patients by both pharmacologic and interpersonal technique.
  - Performing the following regional anaesthesia techniques: Brachial plexus, cervical plexus\*, stellate ganglion block\*, lumbar plexus\*, lumbar sympathetic\*, Sciatic nerve block, Femoral nerve block, 3 in 1 block, Wrist block, Popliteal Nerve block, Trigeminal nerve block, Retro bulbar blocks\*, Paravertebral blocks, Intercostal blocks, Caudal block – adult and pediatric, Ankle block, Epidural block/Catheter, Subarachnoid block, Bier's block, All peripheral nerves of the upper and lower limbs. (\*Peripheral posting)
- Demonstrate practice of **Thoracic Anaesthesia**
    - Pre-operative assessment of patients undergoing Thoracotomy (lung resection), thoracoscopy, video assisted thoracoscopy and mediastinoscopy
    - Various approaches and their relevant equipments for lung isolation.
    - Various double lumen tubes and their placement.
    - Application of Principle of chest drain.
    - Respiratory Physiology and management of one lung ventilation (OLV). Indications, contraindications and hazards of OLV.
    - Application of the knowledge of Anatomy of lung and broncho-pulmonary segments.
    - Anatomy and techniques for intercostals nerve block and thoracic epidural. Management of thoracic epidural anaesthesia and analgesia
    - Anatomy, techniques and placement of paravertebral block/catheter.
    - Post-operative care of patients after lung surgery.
    - Peri-operative management of patients with myasthenia gravis.
    - Peri-operative management of patients with mediastinal mass.
    - Anaesthetic management of mediastinoscopy, major airway stenting.
    - Lung volume reduction surgery and problems.
  - Demonstrate practice of **Cardiovascular Anaesthesia:**

- Application of the knowledge of Anatomy and physiology of valvular disease, coronary arteries and their territories. Pulmonary circulation, coronary circulation, cerebral circulation, visceral circulation.
  - Application of the knowledge of Distribution of blood volume to different organs and systems and their control. Microcirculation. Venous system, venous pressure, its influence on various functions.
  - Regulation of blood pressure, hypotensive anaesthesia.
  - Anatomy and physiology of all operable congenital heart disease like ASD, VSD, PDA, TOF, transposition of great vessels\*. (\*Peripheral posting)
  - Application of the knowledge of anatomy and physiology of vascular heart disease like co-arcuation of aorta.
  - Assessment of cardiac patient with ischaemic heart, valvular heart disease and other diseases listed above. Understanding of cardiac catheterization, echocardiography, stress testing, and radio-nucleide imaging.
  - Application of Principle and complication of cardiopulmonary bypass
  - Application of Principle of trans-esophageal echocardiography
  - Application of Principle of circulatory support: inotropes, IABP, pacing
  - Coagulation and management of coagulopathy.
  - Off pump bypass
  - Intra-operative management of aortic surgery and major peripheral vascular surgery, aneurysm grafts, recanalisation procedures.
  - Understanding of the adult patient with congenital heart disease and their management during anaesthesia.
  - Postoperative cardiac critical care, including cardiovascular problems, analgesia.
  - Insertion of invasive monitoring for arterial monitoring, central venous pressure monitoring, pulmonary artery catheter insertion and interpretation.
  - Robotic cardiac surgery. ( Peripheral posting)
- Demonstrate practice of **Paediatric Anaesthesia**
    - Application of knowledge of Anatomical changes in paediatric patient and neonates.
    - Application of knowledge of Physiology and pharmacology in paediatric patient.
    - Guideline for pre-operative fasting in children and pre-medication.
    - Anaesthetic equipment: laryngoscopes, airways, endotracheal tubes, LMAs,
    - PLMA and breathing circuit for children.
    - Anaesthesia management for premature and newborn.



- Emotional problems for parent and child and principles of premedication. Consent by parents and their presence during induction. To become skilled in communicating with children, parents and other relatives.
- Problems of transporting a sick pediatric patient from the ward to the operating room and back with regard to temperature maintenance, cardiovascular stability, ventilation and oxygenation.
- Estimate preoperatively blood volume, hourly fluid requirements, fluid deficit, third space loss, acceptable blood loss and apply principles of fluid and blood replacement in the perioperative period.
- Induce and maintain anaesthesia by inhalation, intravenous, intramuscular and rectal routes and monitor pediatric patients.
- Understand the benefits, risks and techniques of regional anaesthesia in children. Anatomy and techniques of caudal, dorsal penile and inguinal regional block, spinal and epidural block
- Learn to recognize and treat post anaesthesia complications like apnea, laryngospasm, acid-base and electrolyte disturbances, febrile and convulsing child and bleeding child.
- Common problems related to common congenital syndromes presenting for surgery. Anaesthetic management of a child with concurrent disease – Down's, Pierre Robin syndrome, von Willebrand's disease, Goldenhar's, Sturge-Weber, Tracher-Colin, Prune-Belly, and cyanotic and non-cyanotic congenital heart disease.
- Paediatric resuscitation: drugs, doses and defibrillation of children of all ages, from the very premature neonates to those children with complex coexisting disease.
- Management of patients requiring paediatric intensive care, ventilatory management, and support of circulation. ( Peripheral posting)
- Resuscitation of neonates and children of all ages. A period of one to two months in a PICU is recommended for all post graduate students undergoing advanced training in paediatric anaesthesia.
- Paediatric pain management
- Assessment of a child with URTI, with a heart murmur.
  
- Management of fluid and electrolytes in children.
- Anaesthetic management of a malignant hyperthermia susceptible child.
- Anaesthetic management of FB bronchus, oesophagus, Wilm's tumour, congenital diaphragmatic hernia, tracheo-oesophagus fistula, thoracotomy.
- Anaesthesia for Fetal Surgery.

- Sedation techniques including the selection, management and monitoring of children for diagnostic and therapeutic procedures, with particular attention to working in areas outside the theatre suite.
- Demonstrate practice of **Transplant anaesthesia**( \*Peripheral posting)
  - Application of knowledge of basic pathophysiology of renal and liver failure\*. Principles of anesthetizing an immuno-compromised patient.
  - Principles of anesthetizing patient with end stage renal/liver disease and patient with organ transplantation. Perioperative management.
- Demonstrate practice of **Neuroanaesthesia**
  - Application of basic knowledge of cerebral circulation and intra cranial pressure and its implications
  - Anaesthesia to patients with neurologic disease, head injury undergoing neurologic or non-neurologic surgery and for diagnostic procedures requiring anaesthesia.
  - Anesthetic implications of the most common neurosurgical procedures, transnasal, trans-sphenoidal pituitary surgery. Posterior fossa surgery. Surgery for supratentorial pathology.
  - Application of basic concepts behind electrophysiologic monitoring of the brain and spinal cord.
  - Application of knowledge of general principles of positioning the patient for surgery and the advantages and disadvantages of each position.
  - Effects of anaesthesia on the electroencephalogram (EEG) and evoked potentials.
  - Differential diagnoses and treatment alternatives of intraoperative intracranial hypertension (“tight brain”)
  - Management of Head Trauma, and its anesthetic management and various protocols regarding their management and associated trauma.
  - Intracranial surgery and spinal surgery, both routine and emergency.
  - Monitoring: techniques for detection and management of air embolism.
  - Lumbar puncture and CSF drainage.
  - Non-surgical management of the head trauma patient, Systemic complications of severe brain injury.
  - Management of subarachnoid haemorrhage and vasospasm.
  - Diagnosis and management of patients with brainstem death; and dealing with patient’s relatives
- **Dental, Anesthesia**
  - Understand the principles of conscious sedation
  - Principles of anesthesia in a dental chair
  - Local Blocks for Dental Surgery
- **Ophthalmology**
  - Anesthetize for inlra and extra ocular surgery.

- To give-Monitored Anaesthesia Care.
- To give Ophthalmic nerve blocks.
- **ENT Posting**
  - To give topical anesthesia for awake intubation (nasal and oral)
  - To learn anesthetic problems related to common surgical procedures including thyroid surgery, MLS, laser surgery etc.
  - Learn to manage complications like post **tonsillectomy** bleeding.
- **Obstetric**
  - Learn the physiology of normal pregnancy, fetal and placental physiology effects of anesthesia on human uteroplacental blood flow, labor and delivery.
  - Understand perinatal pharmacology and placental transfer of drugs.
  - Learn all anesthetic techniques suitable for managing normal labor pain including regional anesthesia. Recognize and treat common problems related to continuous epidural.
  - Understand the advantages of regional and general anesthesia for cesarean section.
  - Know the risk factors, prevention, and treatment of maternal aspiration.
  - Recognize high-risk factors in obstetric patients and how they affect anesthetic management.
  - Recognize difficult airway and learn failed intubation drill.
  - Learn fetal monitoring techniques, assessment of a neonate and neonatal resuscitation.
- **Trauma & Resuscitation:** All residents must achieve proficiency in:
  - BCLS, ACLS, BTLS, ATLS, Cerebral preservation.
  - Triage, assessment, transport and management of mass casualties, disaster management.
  - Anesthetic considerations for trauma patients.
  - Documentation and medico legal aspects.
- **Anesthesia outside operating room**
  - Radiology: Special anesthetic considerations for CT, MRI especially in relation to dye allergy and embolization. Problems of patients undergoing radiotherapy.
  - Anesthesia for Electroconvulsive shock therapy (ECT)
  - Cardiac catheterization
- **Urology Service**
  - Anesthetic considerations for urological surgery, special considerations for TURP & lithotripsy.

- Demonstration of anesthetic abilities in the intraoperative period keeping into consideration the specific requirement of the surgical procedure - ENT, Orthopaedic, Gynaecology - Obstetrics, General surgery, Oncosurgery, replacement surgeries, urosurgery, vascular, plastic, Thoracic, Dental etc
- The following are special procedures which the post graduate student must be able to perform
  - Blind Nasal intubation
  - Failed intubation drill (includes Fiberoptic Laryngo/Bronchoscope)
  - Double Lumen Tube
  - Bronchial Blocker placement
  - Jet Ventilation
  - Suctioning and physiotherapy of wet lung
  - Intubation in Neonates
  - Initiation and management of ventilation
  - Combined Spinal Epidural
  - Brachial Plexus Block
  - Intravenous Regional Anaesthesia
  - Elbow, Wrist, Digital, Sciatic, Femoral, Lateral Cutaneous Nerve of thigh, Ankle - each
  - Cervical-Superficial and Deep, Stellate, Splanchnic - each( Peripheral posting)
  - Central Venous Line by Brachial, Jugular and Subclavian veins
  - Radial and Femoral Artery cannulation
  - CVP monitoring
  - Pulmonary Capillary Wedge Pressure
  - Neuro-muscular transmission Monitoring
  - Anaesthetic Depth eg. BIS monitoring

## **V. TIME FRAME FOR TRAINING THE PG STUDENTS:**

The student should be taught as per the following schedule to acquire the skills:

### **1. First 6 months:**

- During the first 6 months, the student should be taught expertise in the management of uncomplicated cases not belonging to any super specialty (ASA I and II cases). To start with, the student will observe and slowly become independent in giving general anaesthesia and spinal anaesthesia to ASA I and II cases for minor and major surgery, under graded supervision.
- The postgraduate student should learn the basic principles of safe and effective anaesthesia, resuscitation, and both the prevention and treatment of pain, perioperative care of the surgical patient, care of handling equipments, basic techniques in anaesthesia, and anaesthetic pharmacology, and electrical safety.
- He/she should select the thesis topic and submit the protocol for his thesis.

## **2. Next 18 months**

- The student should widen his experience and should be able to undertake anaesthetic care of all routine cases, assist in the anaesthetic care for routine obstetric practice, understand basic principles of critical care, pain management, and participate in audit.
- The student should be trained in administration of general anaesthesia and regional anaesthesia for ASA I to V under supervision. The student should be able to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision, and use of Ultrasound machine for giving blocks and venous cannulation. The student should learn paediatric and trauma life supports and maintain skills for basic and advanced cardiac life support.
- It is advised that they should be posted in the following specialties: general surgery including gastrointestinal surgery, transplant, ENT, Urology, Obstetrics, Dental Surgery, Eye, ICU, Pain Clinic and peripheral theatres like ECT, radio diagnostic and therapeutic procedures (CT scan, MRI scan, and angiography).
- The student should be able to analyze data and write a thesis. He/she should be able to present scientific data.

## **3. Last 12 months**

- Thesis should be submitted minimum of 6 months before the final MD examination.
- The post graduate student should be given experience of various super-specialties like cardiothoracic and vascular surgery, neurosurgery and transplantation, and paediatric surgery. The student should be able to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery, and for all major surgeries. The aim at the end is to be competent and independent soon after the third year of junior residency in providing anaesthesia to elective and emergency cases.
- The post graduate student should be able to manage critically ill patients and treat intractable pain. They should also know how to organize resources in case of mass casualty. The curriculum should be able to provide 04 months of elective Intensive Care Unit posting (2 months during initial years under supervision and 2 months independently in the last six months).

## **4. At the end of 3 years, the post graduate student should have the skills to:**

- Plan and conduct anaesthesia and provide post-operative care including pain relief for elective and emergency surgical procedures related to all surgical specialties.
  - Carry out basic life support (BLS) and advanced life support (ALS) and train medical and paramedical staff in BLS and ALS.
  - Manage patients admitted to an intensive care unit with the help of latest equipment.
  - Manage patients suffering from acute and chronic intractable pain(peripheral posting).
  - Organize the hospital environment to manage mass casualty situation and camp anaesthesia.
  - Critically review and acquire relevant knowledge from the journals about the new development in the specialty.
  - Should be able to participate in anaesthesia audit.
5. Overall the student should acquire skills in the following practical competencies: Information management in preoperative evaluation and outcome enhancement and communication skill to patient and relatives.

## **VI. SYLLABUS**

**The course content of 1<sup>st</sup> year covers the following:**

### **1. Anatomy related to:**

- Diaphragm, upper and lower airway
- Regional anaesthesia, field block, central neuraxial, blockade, block for acute pain states
- Intramuscular injections, arterial and venous cannulations and positioning.

### **2. Physics related to:**

- Anaesthesia machine - assembly of necessary items.
- Airway equipment including laryngoscopes, airway devices
- Breathing systems
- Monitoring in anaesthesia with concepts of minimum monitoring
- Gas laws, medical gas supply system
- Fluidics
- Electricity and diathermy
- Oxygen therapy

### **3. Physiology related to:**

- Theories of anaesthesia

- Respiratory, cardiovascular, hepatobiliary, renal and endocrine system, pregnancy, blood, muscle and N-M junction, Nerve impulse transmission, ECG, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP.
  - Central, autonomic and peripheral nervous systems.
  - Metabolic response to stress and trauma.
4. **Pharmacology related to**
    - General principles, concepts of pharmacokinetics and pharmacodynamics
    - Drug interactions in anaesthesiology, anaphylactoid reactions
    - Drugs used for premedication, induction of anaesthesia, general anaesthetics- intra-venous and inhalational, neuromuscular block and reversal of muscle relaxants.
  5. **Biochemistry** relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.
  6. Theoretical background of the commonly used anaesthetic techniques of general and regional anaesthesia, general principles of pre-anesthetic assessment and medication, recovery from anaesthesia and post operative care, effects of positioning during anaesthesia.
  7. Introduction to the operation theatre, post-anaesthesia care rooms
  8. Introduction to acute, chronic pain and pain management.
  9. Documentation and medico-legal aspects of anaesthesia. Defensive anaesthesia. Concept of informed consent.
  10. Resuscitation - basic and advanced life support (cardiac and trauma life support), neonatal resuscitation.
  11. Intensive care of critical patients with introduction to artificial ventilation, management of unconscious patients, oxygen therapy, shock - pathophysiology and management.
  12. Introduction to Research methodology, basics of biostatistics.

**The course content of 2<sup>nd</sup> year covers the following:**

Anatomy related to blocks for chronic pain, chemical neurolysis and different organ systems.

**1. Physics related to:**

- equipments used in anaesthesia monitors, ventilators, vaporizers,
- fibre optics
- Laser
- Pacemaker and defibrillator
- Monitoring equipment used for assessment of cardiac functions,

temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block.

- Sterilization of equipment
  - Computers in anaesthesia
2. Pharmacology of drugs used in cardiovascular, respiratory, endocrine, renal diseases and CNS disorders.
  3. Interpretation of blood gases and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
  4. Blood coagulation mechanism, disturbances, blood components.
  5. Special anaesthetic techniques as relevant to –
    - Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
    - Associated medical disorders in surgical patients
  6. Geriatric and pediatric anaesthesia
  7. Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
  8. Medical statistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.
  9. Care of terminally ill, Hospices management. Do not resuscitate orders.
  10. Postures and anaesthesia.
  11. Induced hypothermia, incidental, and environmental safety of patient.
  12. Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
  13. Third world anaesthesia.
  14. Inherited metabolic diseases and anaesthesia.

**The course contents of 3<sup>rd</sup> year cover the following:**

1. Principles of anaesthetic management of Neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
2. Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
3. Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator.
4. Multiple organ failure
5. Infection control, cross contamination in OT and ICU.
6. Immune response and anaesthesia.
7. Concept of cytokines, and other enzymes.



8. Selection, maintenance and sterilization of anaesthesia and related equipment
9. Chronic pain therapy and therapeutic nerve blocks.
10. Acupuncture, acupressure and other non-conventional methods of treatment.
11. Principles of neonatal resuscitation, ventilation and critical care.
12. Principles of human resources and material management.
13. General principles of medical audit. Critical incident reporting
14. Ethics and clinical trial.
15. Hospital, ICU and OT design and planning.
16. Medical education including evidence based medical education.

## **VII TEACHING AND LEARNING METHODS**

### **Post graduate training and teaching methodology**

1. Instead of didactic lectures arc; seminars, journal clubs, symposia, reviews and guest lecturers shall get priority for theoretical knowledge. Bedside teaching, grand rounds, interactive group discussions and clinical demonstrations shall be the hallmark of clinical /practical learning. Student shall have hand-on training in performing various procedures (medical /surgical concerning his subject) and ability to interpret various tests /investigations. Exposure to newer specialized diagnostic / therapeutic procedures concerning his subject shall be given.
2. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
3. Log books shall be maintained regularly and should be checked and assessed periodically by the faculty members imparting the training.
4. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
5. Department should encourage e-learning activities.

### **Thesis: Supervision**

- The postgraduate is responsible to a Faculty member and the latter should be available to advise and assist the student in his clinical assignments
- A departmental teaching committee under the guidance of HOD will be responsible for the educational activities of the department and the teaching schedule.
- The postgraduates shall be put on roaster emergency duty as per schedule decided based on the work demand. The clinical work during emergency will have a close supervision by the on call faculty with a departmental hierarchy.
- Simulation based training in SVIMS Simulation System(skill lab) will be used for

events of high importance but infrequent occurrence and where there may be high risks to the patients

- Simulation based training will shall be used for both training and assessment of the candidate keeping in view of patient safety.

### **PLAGIARISM**

- While submitting the thesis, the plagiarism clearance report to be attached as per the regulations of SVIMS university (for detailed regulations see the Annexure -II details)

### **Teaching Schedule**

In addition to OR table teaching, in the department there are hourly sessions of formal teaching per week. The departments teaching schedule will be guided as follows

Journal club	20 times in a year
PG clinical case presentation and discussion	20 times in a year
Seminar on specific topics	Once a weak
University session (on various topic of intradepartmental interest including CPC and mortality meeting)	Once a month
Interim thesis presentation	Once in six months
Paramedical and Undergraduate teaching	Twice a month

### **Rotation:**

#### **Schedule for three years of MD Anaesthesia postings:**

The post graduate student shall be permitted to have exposure to the following areas within the hospital during the clinical anaesthesia practice:

1. Pre-anaesthesia clinic
2. Pain clinic
3. Recovery and Post anaesthesia Care Unit ( PACU )
4. Intensive Care Units
5. Dialysis and transplant
6. All specialty theatres
7. Induced hypotensive techniques
8. Induced hypothermia
9. Monitored anaesthesia care
10. Peripheral areas: Radiology, MRI, ECT and other interventional laboratories

Postgraduate Student is posted in various operation theatres to have adequate exposure of following different procedures and operations. The postings to various stations can be guided by the following schedule

<b>Operation theatre</b>	<b>Months</b>
General Surgery	3
Surgical GE	3

Urology	3
Ophthalmology	15 days
Otorhinology	2
Dental	15 days
Surgical Oncology	3
Orthopedics/Trauma/casualty	45d
Gynecology	3
Obstetrics	3
Pediatrics surgery	0
Burns/Plastic	15d
CTVS	2
Neurosurgery	2
ICU	2
Pain/PAC	2
Recovery	0
Organ Transplant posting in the other areas.	15d
(Radiology, Radiotherapy) ECT, Cardiac Cath)	15d

## VIII ASSESSMENT

- **Formative Assessment, during the training programme**

- Formative assessment will be continual and aims to assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system. The purpose of the assessment is to give regular feed back to the candidates about their performance and to prepare them for the final terminal examination by giving them exposure to the examination pattern. Formative assessment will not count towards pass/fail at the end of the program, but will provide feedback to the candidate
- **General Principles**
  - There will be at least FOUR internal assessments to cover all domains of learning including professionalism and communication skills. The Internal Assessment will be conducted in theory and clinical examination by the faculty assigned by the HOD. This would include theory examination (100 marks of three hours duration) containing 10 short structured question related to the topics covered during the preceding six months.
- **Quarterly assessment during the MD training should be based on:**
  - Journal based / recent advances learning
  - Patient based / Skill based learning
  - Self directed learning and teaching
  - Departmental and interdepartmental learning activity

- External and Outreach Activities / CMEs
- The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)

- **Summative Assessment (assessment at the end of training)**

The summative examination would be carried out as per the Rules given in Postgraduate Medical Education Regulations, 2000 amended from time to time.

The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

**Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three concerned examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

## IX EXAMINATION PATTERN

**The Post graduation final examination shall consists of three parts:**

- 1) Thesis
- 2) Theory evaluation
- 3) Practical/Clinical and Oral evaluation

### 1. Thesis

Every post graduate student shall carry out work on an assigned research project **under the guidance of a recognised Post Graduate Teacher**, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.
- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.

- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II) six months before the Theory and Clinical / Practical examination
- For MD/ MS Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

**2. Theory consists of four papers of 3 hours each having 10 short structured questions with 10 marks each:**

<b>Paper-1</b>	Basic Sciences as applied to Anaesthesiology
<b>Paper-2</b>	Practice of Anaesthesia: Anaesthesia in relation to associated systemic and medical diseases
<b>Paper-3</b>	Anaesthesia in relation to subspecialties/super specialties
<b>Paper-4</b>	Intensive Care Medicine, Critical care, Pain Medicine and Recent advances.

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.
- **Moderation of Question Papers :**

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

**Practical/Clinical Examination :**

- Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

**The Practical/Clinical Examination will consist of: 3 clinical cases,**

<b>One long case</b>	Duration:30 min (history, examination, Diagnosis and Management, Discussion)
<b>Two short case</b>	Duration:15 min each. In short cases only relevant history important to anaesthesia to be taken (history, clinical examination and diagnosis, discussion).

**Oral/Viva- Voce :**

The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

Oral/Viva-voce should be conducted preferably on four tables with one examiner on each table: Each table viva is allotted 25 marks (4 table x 25=100 marks). There shall be four examiners out of which minimum two examiners from outside the state and the rest of the two examiners from the institute / within or outside the state.

<b>Table-1</b>	ECG, X-rays, ABG Cards, Pulmonary function tests, Capnographs, clinical exercises card
<b>Table-2</b>	Anaesthetic Drugs, Emergency, Drugs, IV Fluids, Nerve Blocks (skeleton) .
<b>Table-3</b>	Anaesthesia machine including circuits and Vaporizers. ETT, Supraglottic Airway devices, ICU Ventilator and oxygen therapy equipment.
<b>Table-4</b>	Resuscitation equipments, resuscitation demonstration, Difficult Airway Equipment, monitoring equipments.

### **Alternatively, in exceptional situation**

1. One long case, viva voce at one station with all examiners, and: 150 marks
2. 28 OSCE station covering two stations of short cases, drugs ECG, X-rays, PFT, ABG, Respiratory loops, Resuscitation etc.,: 150 marks

The candidate should pass the theory & practical examination separately.

The external examiners will be offered one day extra to evaluate the theory papers in the central evaluation centre of SVIMS. Theory papers will be valued by all the examiners. Practical / Viva will be conducted during one day for a maximum of 8 candidates and for two days for a maximum of 16 candidates. If necessary it can be extended for the second day.

The division of awarded marks will be as follows

<b>Practical:</b>	Long case	=	100 marks
	Short cases	=	2 X 50marks= 100 marks
	Table Viva	=	4 X 25marks = 100 marks

### **Marking System for the Examination :**

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

### **Appointment of Examiners:**

1. No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
2. If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
3. An examiner shall ordinarily be appointed for not more than two consecutive terms.



4. The internal examiner in a subject shall not accept external examiner ship for a college from which external examiner is appointed in his subject.
5. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .

There shall be a panel of 8 External Examiner as advised by the HOD concerned. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

#### **Eligibility for appearing of university examination**

- 85% attendance during each academic term of 6 months,
- Online course in Basic Research Methods by the end of 2<sup>nd</sup> semester as per NMC norms
- One research observations accepted or sent for publication
- Candidate has to present at least one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies Thesis acceptance by all the three examiners
- Log book as per University format to be maintained

#### **Recommended Reading Books (latest edition)**

1. Lee's Synopsis of Anaesthesia
2. Clinical Anesthesiology by Morgan
3. Cardiac Anaesthesia By Joel Kaplan
4. Clinical Anaesthesia by Barash, Cullen and Stoelting
5. Textbook of Anaesthesia by Aitkenhead Rowbotham and Smith
6. Anaesthesia for neonates and infants by Smith
7. Pharmacology and Physiology for Anaesthetists by Stoelting
8. Miller's Anesthesia
9. Stoelting RK, Miller RD Basics of Anaesthesia
10. ICU Book, Paul Marino
11. Text Book of Critical Care, by Shoe maker
12. Regional Anaesthesia, P Prithviraj
13. Practical Management of Pain, Raj
14. Stoelting and Dierdorf: Anaesthesia and Co-existing Disease

15. Dorsch and Dorsch: Understanding Anaesthesia Equipments
16. ECG by Shamroth/Goldman
17. Anatomy for Anaesthetists by Harold Ellis
18. Clinical Anesthesia by P.G.Barash
19. Longneckers Anaesthesiology- Mcgraw Hill

**Must refer:**

1. Millers Anaesthesia
2. Cucchiara and Michenfelder: Clinical Neuroanaesthesia
3. Cottrell and Smith: Anaesthesia and Neurosurgery
4. Complications in Anaesthesiology by Orkin
5. Complications in Anaesthesia by Raven
6. Airway management by JL Benumof
7. Obstetric Anaesthesia by Chestnut

**Journals**

- 03 international Journals and 02 national (all indexed) journals

## **X Annexure - I**

### **Postgraduate Students Appraisal Form M.D. (Anaesthesiology and Critical Care)**

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based/recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis/Research work				
7.	Log Book Maintenance				

Publications Yes/ No

Remarks\* \_\_\_\_\_  
\_\_\_\_\_

**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD

## **XI. Annexure - II**

### **PLAGIARISM**

#### **SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**

(A University established by an Act of A.P. State Legislature)

##### **GUIDELINES FOR 'PLAGIARISM' CHECK**

##### **WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D students**

**Ref.:Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/MS/ DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for Theses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

#### **1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

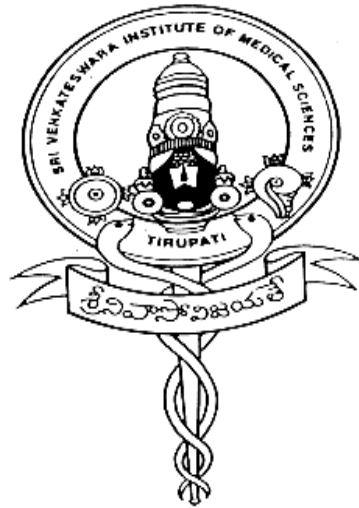
####

# **LOG BOOK**

## **SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,**

*(A University established by an Act of Andhra Pradesh Legislature)*

**TIRUPATI – 517 507**



# **LOG BOOK**

## **COMMON FOR MD/ MS/ DM/ M.Ch. POSTGRADUATES**

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

## PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From ...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :

*(Preferably be done by the faculty with whom the resident worked for most part of the period)*

### **Quality parameters being Assessed:**

1. Donor / Patient Evaluation
2. Academic Knowledge about Donor / Patient's Problems
3. Curiosity about unexplained Observations
4. Donor / Patient Care
5. Donor / Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

*Signature of the candidate*

*Signature of the guide*

*Signature of the HoD with seal*

**DETAILS OF POSTINGS OVER 3 YEARS**

**1st YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

*Signature of Faculty :*

**2nd YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

**3rd YEAR** From..... To.....

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

*Signature of Faculty:*

**Thesis Topic :**

**Guide :**

**Co-Guides :**



### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Journal Review Presentations:

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material, Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyze the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### CASES PRESENTED IN MORTALITY CONFERENCE

S. No.	Topic	Signature of supervising Faculty

### LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED

S. No.	Topic	Signature of supervising Faculty

### LAB / INVASIVE PROCEDURES PERFORMED

S. No.	Date	Procedures	Complications if Any	Signature of supervising Faculty

### CONFERENCES ATTENDED

S. No.	Name	Role	Signature of supervising Faculty

### PUBLICATIONS

S. No.	Topic	Journal	Role

### BEDSIDE CASE DISCUSSION

S. No.	Date	Diagnosis	Signature of Faculty Presented to

## SUMMARY OF LOG BOOK

*(To be filled at the end of the course & retained in this book)*

- Name of the student : Admn. No.
- Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_
- Name of the Institute:
- 1) No. of Journal Review Presentations : Presented ..... Attended .....
- 2) No. of Seminar Presentations : Presented ..... Attended .....
- 3) No. of Clinical Presentations : Presented ..... Attended .....
- 4) No. of Case Presentations : Presented ..... Attended .....
- 5) No. of UG Teaching Programmes : Conducted ..... Attended .....
- (Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
- 6) No. of PG Teaching Programmes : Attended
- 7) No. of Investigative Procedures : Performed .....Assisted.....Observed...
- 8) No. of Major Operations / : Performed .....Assisted.....Observed...
- Procedures /  
Experiments
- 9) No. of Minor Operations / : Performed .....Assisted.....Observed...
- Procedures /  
Experiments
- 10) No. of Emergencies : Performed .....Assisted.....Observed...
- 11) No. of Medico-legal work : Performed .....Assisted.....Observed...
- 12) No. of Public Health Visit /
- Social work /  
Survey /  
Immunization /  
Camps
- 13) No. of Clinico-Pathological Conference: Presented ..... Attended.....
- 14) No. of special investigation / : Conducted .....Attended .....
- Procedure
- 15) No. of events attended Conferences..... Symposia .....
- Workshops ..... CME .....
- 16) Any other activities :

*Signature of the candidate*

*Signature of the guide*

*Signature of the HoD with seal*

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI - 517 507**



**M.D. - MICROBIOLOGY**

**COMMON BOARD OF STUDIES MEETING**

**ON 21/07/2021**

---

**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUAPATI**

**M.D. (MICROBIOLOGY)**

**COMMON BOARD OF STUDIES MEETING ON 21/07/2021**

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# SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES: TIRUPATI

## M.D (MICROBIOLOGY)

### COMMON BOARD OF STUDIES MEETING ON 21.07.2021

#### List of Members:

1. Dr B. Siddhartha Kumar - Chairman  
Dean, SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar, SVIMS, Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr Ashish Jitendranath - External expert  
Professor,  
Dept. of Microbiology,  
SGMC&RF  
Thiruvananthapuram  
Kerala
5. Dr B. Venkata Ramana - Internal Expert  
Associate Professor & Head i/c,  
Dept. of Microbiology,  
SVIMS, Tirupati
6. Dr R. Jayaprada - Internal Expert  
Associate Professor,  
Dept. of Microbiology,  
SVIMS, Tirupati



# **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D., IN MICROBIOLOGY**

**(As prescribed by MCI, 2018)**

**\*\*\***

## **I. PREAMBLE**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The purpose of preparing these Guidelines is to standardize Microbiology teaching at Post Graduate level throughout the country so that it will achieve uniformity in undergraduate teaching as well.

This document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

**TITLE: M.D., MICROBIOLOGY**

**GOAL OF THE PROGRAM:** The goal is to have uniform standards in the teaching of Microbiology at Postgraduate level throughout the country. The guidelines will help achieving such standards which will in ensure availability of competent Microbiologist equipped with required knowledge and skills.

## II. AIM & OBJECTIVES OF THE PROGRAM

A post graduate student upon successfully qualifying in the MD (Microbiology) examination should be able to:

1. Demonstrate competence as a clinical microbiologist.
2. Interact effectively with the allied departments by rendering services in basic as well as advanced laboratory investigations.
3. Demonstrate application of microbiology in a variety of clinical settings to solve diagnostic and therapeutic problems along with preventive measures.
4. Play a pivotal role in hospital infection control, including formulation of antibiotic policy and management of biomedical waste.
5. Acquire skills in conducting collaborative research in the field of Microbiology and allied sciences.
6. Conduct such clinical/experimental research as would have significant bearing on human health and patient care.
7. Demonstrate effective communication skills required for the practice of clinical microbiology and while teaching undergraduate students.
8. Establish good clinical microbiological services in a hospital and in the community in the fields of bacteriology, virology, parasitology, immunology and mycology.
9. Plan, execute and evaluate teaching assignments in Medical Microbiology.
10. Plan, execute, analyze and present the research work in medical microbiology.
11. To acquire various skills for collaborative research.
12. To participate in various workshops/seminars/journal clubs/demonstration in the allied departments.
13. Uphold the prestige of the discipline amongst the fraternity of doctors.

### III. REGULATIONS

- a) **Eligibility for admission:** A candidate seeking admission into the course shall have MCI / NMC recognized MBBS qualification.
- b) **Admission:** In order to be **eligible** for admission to any postgraduate course in a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in 'National Eligibility-cum- Entrance Test for Postgraduate courses' held for the said academic year.
- c) **All the students should get their degree registered with AP state medical council before completion of first semester.**
- d) **Duration of the course:** The duration of the course shall be three calendar years (including the period of examination).
- e) **Bond:**
- i) The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/-value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. **5,00,000/- (Rupees Five Lakhs only)** along with the full stipend amount received by him/her back to the Institute.
  - ii) The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.20,00,000 (Rupees Twenty lakhs only).
- f) **Training Programme:** The candidate joining the course must work as full time Resident during the period of Post Graduate Training.
- Note:** In-Service candidate will not be paid stipend if He / She draws leave salary in that parent institution.

**g) External training:** The residents are permitted for external posting during the training period on payment of stipend for a period not exceeding one month as per the need and on recommendation of the HoD. The request for such training shall be submitted to the Dean, SVIMS through proper channel, two months in advance in order to process with the institution where the posting is required. The expenditure towards travel, accommodation and fees shall be borne by the individual.

**h) Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

**i) Attendance:** All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

**PROGRAM CONTENT - KNOWLEDGE and COURSE CONTENT - SKILLS**  
**SUBJECT SPECIFIC COMPETENCIES**

**A) Cognitive Domain:**

At the end of the course, the student should have acquired knowledge in the following theoretical competencies:

**General Microbiology**

1. Important historical events and developments in microbiology
2. Basic as well as advanced knowledge in various microscopes and microscopic techniques used in diagnostic microbiology
3. Various bio-safety issues including physical and biological containment, universal containment, personal protective equipment for biological agents
4. Various isolation precautions including standard and transmission based precautions
5. In-depth knowledge about various method of Sterilization, disinfection and lyophilization
6. Nomenclature, classification and morphology of bacteria as well as other microorganisms
7. Various types and significance of normal flora of human body in health and disease states.
8. Requirements for growth and nutrition of bacteria along with bacterial metabolism
9. Various types and role of bacterial toxins and bacteriocins
10. Microbiology of air, milk, water as well as hospital environment
11. Various types of host-parasite relationship and their significance
12. Various antimicrobial agents and mechanisms drug resistance
13. Bacterial genetics, bacteriophages and molecular genetics relevant for medical microbiology
14. Applications of quality assurance, quality control in microbiology and accreditation of laboratories

## **Immunology**

1. Components of immune system, types of immunity (Innate, acquired, mucosal, humoral and cell mediated immunity) and immune response
2. Describes and identifies uses of various antigens, immunoglobulins (antibodies) and antigen and antibody reactions
3. Complement system and Cytokines
4. Various disorders like hypersensitivity, immunodeficiency and auto-immunity involving immune system
5. MHC complex, Immune tolerance, Transplantation and Tumor immunity
6. Various types, techniques, advances, and applications of vaccines and immunotherapy
7. Measurement of immunological parameters
8. Immunological techniques and their applications in diagnostic microbiology as well as research
9. Mechanisms and significance of immune-potential and immune-modulation

## **Systemic bacteriology**

1. Demonstrate knowledge and skills in various techniques for isolation and identification of bacteria
2. Demonstrate knowledge about epidemiology, morphology, biochemical properties, antigenic nature, pathogenesis, complications, laboratory diagnosis treatment and prevention of major bacterial pathogens of medical importance given below-
  - a. Gram positive cocci including Staphylococcus, Micrococcus, Streptococcus, anaerobic cocci etc.
  - b. Gram negative cocci including Neisseria, Branhamella, Moraxella etc.
  - c. Gram positive bacilli including Lactobacillus, Coryneform bacteria, Bacillus and aerobic bacilli, Actinomyces, Nocardia, Actinobacillus and other actinomycetales, Erysipelothrix, Listeria, Clostridium and other spore bearing anaerobic bacilli etc.
  - d. Gram negative bacilli including Vibrios, Aeromonas, Plesiomonas, Haemophilus, Bordetella, Brucella, Gardnerella, Pseudomonas and other non-fermenters, Pasteurella, Francisella, Bacteroides, Fusobacterium, Leptotrichia and other anaerobic gram negative bacilli etc.
  - e. Helicobacter, Campylobacter, Calymmatobacterium, Streptobacillus,

Spirillum and miscellaneous bacteria

- f. Enterobacteriaceae
- g. Mycobacteria
- h. Spirochaetes
- i. Chlamydia
- j. Mycoplasmatales; Mycoplasma, Ureaplasma, Acholeplasma and other Mycoplasmas.
- k. Rickettsiae, Coxiella, Bartonella etc.

## **Mycology**

1. Explain general characteristics including morphology, reproduction and classification of fungi
2. Demonstrate knowledge and skills for isolation and identification of fungi
3. Explain tissue reactions to fungi
4. Demonstrate knowledge about epidemiology, morphology, biochemical properties, antigenic nature, pathogenesis, complications, laboratory diagnosis treatment and prevention of major fungal pathogens of medical importance given below-
  - a. Yeasts and yeast like fungi including Candida, Cryptococcus, Malassezia, Trichosporon, Geotrichum, Saccharomyces etc.
  - b. Mycelial fungi including Aspergillus, Zygomycetes, Pseudallescheria, Fusarium, Piedra, other dematiaceous hyphomycetes and other hyalohyphomycetes etc.
  - c. Dimorphic fungi including Histoplasma, Blastomyces, Coccidioides, Paracoccidioides, Sporothrix, Penicillium marneffeii etc.
  - d. Dermatophytes
  - e. Fungi causing Mycetoma, Chromoblastomycosis, Occulomycosis and Otomycosis.
  - f. Pneumocystis jirovecii infection
  - g. Rhinosporidium seeberi and Lacazia loboi (formerly named Loboia loboi)
  - h. Pythium insidiosum
  - i. Prototheca
5. Able to identify laboratory contaminant fungi

6. Explain Mycetism and mycotoxicosis along with agents involved
7. Demonstrates knowledge about antifungal agents and perform in vitro antifungal susceptibility tests.

### **Virology**

1. Demonstrates knowledge about general properties, classification, morphology, virus replication and genetics of viruses
2. Explain pathogenesis of viral infections
3. Demonstrates knowledge about isolation and identification of viruses
4. Demonstrate knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of major DNA viruses of medical importance including Pox viruses, Herpes viruses, Adeno viruses, Hepadna virus, Papova viruses and Parvo viruses etc.
5. Demonstrate knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of major RNA viruses of medical importance including Entero viruses, Toga viruses, Flavi viruses, Orthomyxo viruses, Paramyxo viruses, Reoviruses, Rhabdo viruses, Arena viruses, Bunya viruses, Retro viruses, Filo viruses, Human Immunodeficiency Virus, Arbo viruses, Corona viruses, Calci viruses etc.
6. Demonstrate knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of major Hepatitis viruses
7. Demonstrate knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of unclassified viruses and slow viruses including prions
8. Demonstrate knowledge about viral vaccines and anti-viral drugs.

### **Parasitology**

1. Demonstrate knowledge about general characters, classification and methods of identification of parasites.
2. Demonstrate knowledge about epidemiology, morphology, antigenic nature,



lifecycle, pathogenesis, complications, laboratory diagnosis, treatment and prevention of Protozoan parasites of medical importance including Entamoeba, Free living amoebae, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium, Toxoplasma, Sarcocystis, Cryptosporidium, Microsporidium, Cyclospora, Isospora, Babesia, Balantidium, etc.

3. Demonstrate knowledge about epidemiology, morphology, antigenic nature, life cycle, pathogenesis, complications, laboratory diagnosis, treatment and prevention of helminthes of medical importance including those belonging to Cestoda (Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Dipylidium, Multiceps etc.), Trematoda (Schistosomes, Fasciola, Fasciolopsis, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis etc.) and Nematoda (Trichiuris, Trichinella, Strongyloides, Ancylostoma, Necator, Ascaris, Toxocara, Enterobius, Filarial worms, Dracunculus etc. )
4. Demonstrate knowledge about common arthropods and other vectors viz. mosquito, sand fly, ticks, mite, cyclops, louse, myasis of medical importance.
5. Demonstrate knowledge about anti-parasitic vaccine and drugs.

### **Applied Microbiology**

1. Demonstrate knowledge about epidemiology of infectious diseases
2. Demonstrate knowledge about antimicrobial prophylaxis and therapy
3. Demonstrate knowledge about hospital acquired infections
4. Demonstrate knowledge about management of biomedical waste
5. Effectively investigate an infectious outbreak in hospital and community
6. Demonstrate knowledge about infections of various organs and systems of human body viz. respiratory tract infections, urinary tract infections, central nervous system infections, congenital infections, reproductive tract infections, gastrointestinal infections, hepatitis, pyrexia of unknown origin, infections of eye, ear and nose, septicaemia, endocarditis, haemorrhagic fever etc.
7. Demonstrate knowledge about opportunistic infections
8. Demonstrate knowledge about various sexually transmitted diseases
9. Demonstrate knowledge about principles, methods of preparation, administration and types of vaccines
10. Effectively use information technology (Computers) in microbiology
11. Demonstrate knowledge and applications of Automation in Microbiology

12. Demonstrate knowledge and applications about molecular techniques in the laboratory diagnosis of infectious diseases
13. Demonstrate knowledge in statistical analysis of microbiological data and research methodology
14. Demonstrate knowledge in animal and human ethics involved in microbiology
15. Demonstrate knowledge in safety in laboratory and Laboratory management

**B) Affective Domain:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopts ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and students for effective teaching.

**C) Psychomotor domain:**

1. Collection/transportation of specimens for microbiological investigations
2. Preparation, examination and interpretation of direct smears from clinical specimens
3. Plating of clinical specimens on media for isolation, purification, identification and quantification purposes.
4. Preparation of stains viz. Gram, Albert's, ZiehlNeelsen (ZN), Silver impregnation stain and special stains for capsule and spore etc.
5. Preparation and pouring of media like Nutrient agar, Blood Agar, Mac-Conkey agar, Sugars, Kligler iron agar/Triple sugar iron agar (TSI), Robertson's cooked meat broth, Lowenstein Jensens medium, Sabouraud's dextrose agar etc.
6. Preparation of reagents-oxidase, Kovac etc.
7. Quality control of media, reagents etc.
8. Operation of autoclave, hot air oven, filters like Seitz and membrane filters etc
9. Care and operation of microscopes

10. Washing and sterilization of glassware (including plugging and packing)
11. Care, maintenance and use of common laboratory equipments like autoclave, hot air oven, water bath, centrifuge, refrigerators, incubators etc.
12. Aseptic practices in laboratory and safety precautions. Selection of Personal Protective Equipment according to task and donning (gloves, mask, eye protection, gown etc).
13. Sterility tests
14. Identification of bacteria of medical importance up to species level (except anaerobes which could be up to generic level).
15. Techniques of anaerobiosis
16. Tests for Motility: hanging drop, Cragie's tube, dark ground microscopy for spirochaetes
17. Routine and Special tests - Catalase test, Oxidase test, slide and tube coagulasetests, niacin and catalase tests for Mycobacterium, bile solubility, chickcellagglutination, sheep cell haemolysis, satellitism, CAMP test, and other biochemical tests.
18. Preparation of antibiotic discs; performance of antimicrobial susceptibility testing eg. Kirby-Bauer, Stoke's method, Estimation of Minimal Inhibitory/Bactericidal concentrations by tube/plate dilution methods.
19. Tests for B-lactamase production.
20. Screening of gram negative isolates for ESBL and MBL
21. Screening of Staphylococci for Methicillin Resistance.
22. Screening of Enterococci for Vancomycin resistance.
23. Testing of disinfectants.
24. Quantitative analysis of urine by pour plate method and semi quantitative analysis by standard loop tests for finding significant bacteriuria
25. Disposal of contaminated materials like cultures
26. Disposal of infectious waste
27. Bacteriological tests for water, air and milk
28. Maintenance and preservation of bacterial cultures

## IV. TRAINING PROGRAMME

**Time frame to acquire Knowledge and skills:**

- **Knowledge :**

End of 1 <sup>st</sup> Year	End of 2 <sup>nd</sup> Year	End of 3 <sup>rd</sup> Year
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<b>GENERAL MICROBIOLOGY:</b>	<b>IMMUNOLOGY: Clinical</b>	<b>GENERAL MICROBIOLOGY &amp; IMMUNOLOGY:</b>
<ol style="list-style-type: none"> <li>1. History and Pioneers in Microbiology</li> <li>2. Microscopy</li> <li>3. Nomenclature and classification of microbes</li> <li>4. Morphology of bacteria and other micro-organisms</li> <li>5. Growth and Nutrition of bacteria</li> <li>6. Bacterial metabolism</li> <li>7. Sterilization and disinfection</li> <li>8. Culture media and culture methods</li> <li>9. Identification of bacteria</li> <li>10. Bacterial toxins</li> <li>11. Bacterial antagonism: Bacteriocins</li> <li>12. Bacterial genetics</li> <li>13. Gene cloning</li> <li>14. Antibacterial substances used in the treatment of infections and drug resistance in bacteria</li> <li>15. Bacterial ecology – Normal flora of human body, Hospital environment, Air, water and milk</li> </ol>	<ol style="list-style-type: none"> <li>1. Hypersensitivity</li> <li>2. Immunodeficiency</li> <li>3. Auto-immunity</li> <li>4. Immune tolerance</li> <li>5. Transplantation immunity</li> <li>6. Tumour immunity</li> <li>7. Immunoprophylaxis and immunotherapy</li> <li>8. Measurement of immunity</li> </ol>	<p style="text-align: center;"><b>All</b></p>

16. Host-parasite relationship		
<b>IMMUNOLOGY:</b> 1. Innate and acquired immunity 2. Antigens 3. Immunoglobulins 4. Antigen and antibody reactions 5. Complement system 6. The normal immune system: structure and function 7. Immune response	<b>SYSTEMATIC BACTERIOLOGY</b> 1. Streptococcus and Lactobacillus 2. Staphylococcus and Micrococcus 3. Pseudomonas 4. The Enterobacteriaceae 5. Mycobacteria 6. Corynebacterium and other Coryneform bacteria 7. Vibrios, Aeromonas, Plesiomonas, Campylobacter and spirillum 8. Neisseria, Branhamella and Moraxella 9. Haemophilus and Bordetella 10. Bacillus: the aerobic spore-bearing bacilli 11. Clostridium: the spore-bearing anaerobic bacilli 12. Non-sporing anaerobe 13. The Spirochaetes	<b>SYSTEMATIC BACTERIOLOGY (2<sup>nd</sup> year):</b> <b>Plus</b> 14. Actinomycetes, Nocardia and Actinobacillus 15. Erysipelothrix and Listeria 16. The Bacteroidaceae: Bacteroides, Fusobacterium and Leptotrichia 17. Chromobacterium, Flavobacterium, Acinetobacter and Alkaligenes 18. Pasteurella, Francisella 19. Brucella 20. Chlamydia 21. Rickettsiae 22. Mycoplasmatales: Mycoplasma, Ureaplasma and Achleplasma 23. Miscellaneous bacteria

<p><b>MICROBIOLOGY APPLIED TO TROPICAL MEDICINE AND RECENT ADVANCES</b></p> <ol style="list-style-type: none"> <li>1. Normal Microbial flora</li> <li>2. Epidemiology of infectious diseases</li> <li>3. Hospital acquired infections and Hospital waste disposal</li> <li>4. Bacteriology of water milk and air</li> </ol>	<p><b>VIROLOGY:</b></p> <ol style="list-style-type: none"> <li>1. The nature of viruses</li> <li>2. Classification of viruses</li> <li>3. Morphology: virus structure</li> <li>4. Virus replication</li> <li>5. The genetics of viruses</li> <li>6. The pathogenicity and lab diagnosis of viruses</li> <li>7. Epidemiology of viral infections</li> <li>8. Anti-viral drugs</li> <li>9. Bacteriophages</li> <li>10. Herpes viruses</li> <li>11. Paramyxoviruses</li> <li>12. Influenza virus</li> <li>13. Hepatitis viruses</li> <li>14. Rabies virus</li> <li>15. Human immunodeficiency viruses</li> </ol>	<p><b>VIROLOGY (2<sup>nd</sup> Year): plus</b></p> <ol style="list-style-type: none"> <li>1. Vaccines</li> <li>2. Pox viruses</li> <li>3. Vesicular viruses</li> <li>4. Toga viruses</li> <li>5. Bunya viruses</li> <li>6. Arena viruses</li> <li>7. Marburg and Ebola viruses</li> <li>8. Rubella virus</li> <li>9. Arbo viruses</li> <li>10. Respiratory diseases: Rhinoviruses, adenoviruses and corona viruses</li> <li>11. Enteroviruses; Polio, Echo and Coxsackie viruses</li> <li>12. Other enteric viruses</li> <li>13. Slow viruses</li> <li>14. Oncogenic viruses</li> <li>15. Teratogenic viruses</li> </ol>
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	<p><b>PARASITOLOGY:</b></p> <ol style="list-style-type: none"> <li>1. General Parasitology</li> <li>2. <b>Protozoan parasites of medical importance:</b> Entamoeba, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium</li> </ol>	<p><b>PARASITOLOGY (2<sup>nd</sup> Year): plus</b></p> <ol style="list-style-type: none"> <li>1. <b>Protozoan parasites of medical importance:</b>  Toxoplasma, Sarcocystis, Cryptosporidium, Babesia, Balantidium etc.</li> <li>2. <b>Helminthology:</b>  All those medically important helminthes belonging to Cestoda, Trematoda and Nematoda.</li> <li>3. <b>Cestodes:</b>  Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Dipylidium, Multiceps etc.</li> <li>4. <b>Trematodes:</b>  Schistosomes, Fasciola, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis etc.</li> <li>5. <b>Nematodes:</b>  Trichuris, Trichinella, Strongyloides, Ancylostoma, Necator, Ascaris, Toxocara, Enterobius, Filarial worms, Dracunculus, etc.</li> <li>6. <b>Ecto-parasites:</b>  Common arthropods and other vectors viz., Mosquito, Sand fly,</li> </ol>
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		Ticks, Mite, Cyclops
	<b>MYCOLOGY</b> 1. The morphology reproduction in fungi 2. Classification of fungi 3. Dermatophytes 4. Candida 5. aspergillus	<b>MYCOLOGY (2<sup>nd</sup> Year): plus</b> 1. Contaminant and opportunistic fungi 2. Fungi causing superficial mycoses 3. Fungi causing subcutaneous mycoses 4. Fungi causing systemic infections 5. Anti-mycotic agents

		<p><b>MICROBIOLOGY APPLIED TO TROPICAL MEDICINE AND RECENT ADVANCES</b></p> <ol style="list-style-type: none"> <li>1. Infections of various organs and systems of human body</li> <li>2. Molecular genetics as applicable to microbiology</li> <li>3. Vaccinology: principle, methods of preparation, administration of vaccines.</li> <li>4. Bio-terrorism</li> </ol> <p><b>ALLIED BASIC SCIENCES</b></p> <p><b>a). Biochemistry:</b></p> <p>Basic understanding of biochemistry as applied to immunological / molecular methods for study of microbial diseases and pathogenesis of infections.</p> <ol style="list-style-type: none"> <li>1. Protein purification and estimation</li> <li>2. Protein estimation</li> <li>3. Nucleic acid purification and characterization</li> <li>4. Agarose and polyacrylamidegel electrophoresis - principles</li> <li>5. Ultracentrifugation - principles</li> </ol>
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		<p>6. Column chromatography – principles</p> <p><b>b) Molecular Biology:</b> Basic knowledge as applicable to molecular diagnostics and molecular epidemiology.</p> <ol style="list-style-type: none"> <li>1. Recombinant DNA technology</li> <li>2. Southern, northern and western blotting</li> <li>3. DNA amplification techniques</li> <li>4. Diagnostic PCR, different methods of PCR product detection (liquid hybridization, ELISA)</li> <li>5. Genotyping of microbes and viruses</li> </ol> <p><b>c) Pathology: (as applied to Microbiology)</b></p> <p>Basic knowledge of</p> <ol style="list-style-type: none"> <li>1. Inflammation and repair</li> <li>2. Intercellular substances and reaction</li> <li>3. Pathological changes in the body in bacterial, viral, mycotic and parasitic infections</li> <li>4. Demonstration of pathogen in tissue section</li> </ol>
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- **Skills:**

<b>1<sup>st</sup> Year Residency-skills list</b>					
Area	Sr. No.	Procedure	Observed no.	Assisted no. / practice on dummy	Performed independently no. (under supervision)
General Microbiology	1.	Microscopy for unstained preparations / wet mount	5	5	10
	2.	Microscopy for stained preparation	5	5	10
	3.	Preparation of direct smears from clinical specimens	5	5	10
	4.	Hanging drop preparation	5	5	10
	5.	Washing, sterilization and packing of glassware	10 sessions	-	-
	6.	Infection control activities- environmental sampling	10	10	-
	7.	Identification of HAI	5	5	-
	8.	Calculation of HAI quality indicators	5	5	-
	9.	Bacteriology of water	5	5	-
	10.	Bacteriology of air	5	5	-
	11.	Antibiotic disc preparation	-	-	-
	12.	Handling of laboratory animal	-	-	-
	13.	Methods for preservation of bacteria	10	-	-
	14.	Maintenance of stock cultures	10	-	-
Staining	1.	Gram staining	10	20	30
	2.	Acid fast staining (Ziehl-Neelsen method)	10	20	30
	3.	Albert staining	5	10	10
	4.	Modified ZN staining for M.leprae	5	5	5
	5.	Modified ZN staining for Nocardia	5	5	5
	6.	IQC-staining	5	5	5
Media Preparation	1.	Preparations of stains	4	4	4

	2.	Preparation of reagents	10	10	10
	3.	Preparations, plugging, pouring & Quality Control (QC) of culture media	20	20	30
	4.	Operation & maintenance of autoclave	10	10	20
Bacteriology	1.	Specimen collection for Blood Culture	5	5	5
	2.	Inoculation of liquid & solid media	20	20	30
	3.	Identification test	20	20	30
	4.	Antimicrobial sensitivity testing- modified Kirby-bauer technique	10	20	30
	5.	IQC-Antibiotic disc potency	5	5	-
	6.	Operation of BacT/ALERT	5	10	20
	7.	Operation of Vitek 2 compact	5	10	20
	8.	Petroff's concentration technique	10	10	20
	9.	AFB culture & sensitivity	5	10	20
Mycology	1.	KOH wet mount	5	10	20
	2.	Germ tube test	5	10	20
	3.	Slide culture	5	10	20
	4.	Negative staining for fungus	5	5	5
	5.	LPCB mount	10	10	10
Parasitology	1.	Giemsa staining for thick & thin peripheral blood smear	5	-	-
	2.	Stool wet mount for R/M	10	20	30
	3.	Stool concentration techniques	5	10	5
	4.	Modified ZN staining for C.parvum	2	2	2
Serology / Immunology	1.	Phlebotomy & separation of serum	10	10	5
	2.	Operation & maintenance of mini-VIDAS	5	10	20

	3.	Operation & maintenance of ELISA reader & washer	5	10	-
		Performance of serological tests			
	1.	Latex agglutination test (RA, ASO)	10	20	30
	2.	RPR card test	10	20	30
	3.	Tube agglutination test	10	20	30
	4.	Gold conjugate rapid card test	10	20	30
	5.	ANA by IF	5	5	-
	6.	ANA by Immunoblot	5	5	-
	7.	IQC-serology	5	5	5



**2<sup>nd</sup> Year Residency-skills list**

Area	Sr. No.	Procedure	Observed no.	Assisted no. / practice on dummy	Performed independently no. (under supervision)
General Microbiology	1.	Microscopy for unstained preparations / wet mount	-	-	-
	2.	Microscopy for stained preparation	-	-	-
	3.	Preparation of direct smears from clinical specimens	-	-	-
	4.	Preparation of slit skin smear for lepra bacilli	5	5	5
	5.	Hanging drop preparation	-	-	10
	6.	Washing, sterilization and packing of glassware	05 sessions	-	-
	7.	Infection control activities- environmental sampling	-	10	10
	8.	Identification of HAI	-	5	5
	9.	Calculation of HAI quality indicators	-	5	5
	10.	Bacteriology of water	-	5	5
	11.	Bacteriology of air	-	5	5
	12.	Antibiotic disc preparation	05 lots	-	-
	13.	Handling of laboratory animal	-	-	-

	14.	Methods for preservation of bacteria	-	5	10
	15.	Maintenance of stock cultures	-	5	10
Staining	1.	Gram staining	-	-	30
	2.	Acid fast staining (Ziehl-Neelsen method)	-	-	30
	3.	Albert staining	-	-	5
	4.	Modified ZN staining for M.leprae	-	-	5
	5.	Modified ZN staining for Nocardia	-	-	5
	6.	IQC-staining	-	-	5
Media Preparation	1.	Preparations of stains	-	-	5
	2.	Preparation of reagents	-	-	15
	3.	Preparations, plugging, pouring & Quality Control (QC) of culture media	-	-	50
	4.	Operation & maintenance of autoclave	-	-	20
Bacteriology	1.	Specimen collection for Blood Culture	-	-	5
	2.	Inoculation of liquid & solid media	-	-	30
	3.	Identification test	-	-	30
	4.	Antimicrobial sensitivity testing-modified Kirby-bauer technique	-	-	30
	5.	IQC-Antibiotic disc potency	-	5	5
	6.	Operation of BacT/ALERT	-	-	20
	7.	Operation of Vitek 2 compact	-	-	20
	8.	Petroff's concentration technique	-	-	20
	9.	AFB culture & sensitivity	-	-	20

Mycology	1.	KOH wet mount	-	-	20
	2.	Germ tube test	-	-	20
	3.	Slide culture	-	-	20
	4.	Negative staining for fungus	-	-	5
	5.	LPCB mount	-	-	10
Parasitology	1.	Giemsa staining for thick & thin peripheral blood smear	-	10	-
	2.	Stool wet mount for R/M	-	-	30
	3.	Stool concentration techniques	-	-	5
	4.	Modified ZN staining for C.parvum	-	-	2
Serology / Immunology	1.	Phlebotomy & separation of serum	-	-	5
	2.	Operation & maintenance of mini-VIDAS	-	-	20
	3.	Operation & maintenance of ELISA reader & washer	-	-	20
		Performance of serological tests			
	1.	Latex agglutination test (RA, ASO, CRP)	-	-	30
	2.	RPR card test	-	-	30
	3.	Tube agglutination test	-	-	30
	4.	Gold conjugate rapid card test	-	-	30
	5.	ANA by IF	-	-	10
	6.	ANA by Immunoblot	-	-	10
7.	IQC-serology	-	-	5	

**3<sup>rd</sup> Year Residency-skills list**

Area	Sr. No.	Procedure	Observed no.	Assisted no. / practice on dummy	Performed independently no. (under supervision)
General Microbiology	1.	Microscopy for unstained preparations / wet mount	-	-	-
	2.	Microscopy for stained preparation	-	-	-
	3.	Preparation of slit skin smear for lepra bacilli	-	-	-
	4.	Hanging drop preparation	-	-	-
	5.	Washing, sterilization and packing of glassware	05 sessions	-	-
	6.	Infection control activities- environmental sampling	-	-	10
	7.	Identification of HAI	-	-	5
	8.	Calculation of HAI quality indicators	-	-	5
	9.	Bacteriology of water	-	-	5
	10.	Bacteriology of air	-	-	5
	11.	Antibiotic disc preparation	-	5 lots	2 lots
	12.	Handling of laboratory animal	-	-	10

	13.	Methods for preservation of bacteria	-	-	10
	14.	Maintenance of stock cultures	-	-	10
Staining	1.	Gram staining	-	-	30
	2.	Acid fast staining (Ziehl-Neelsen method)	-	-	30
	3.	Albert staining	-	-	5
	4.	Modified ZN staining for M.leprae	-	-	5
	5.	Modified ZN staining for Nocardia	-	-	5
	6.	IQC-staining	-	-	5
Media Preparation	1.	Preparations of stains	-	-	10
	2.	Preparation of reagents	-	-	15
	3.	Preparations, plugging, pouring & Quality Control (QC) of culture media	-	-	50
	4.	Operation & maintenance of autoclave	-	-	5
Bacteriology	1.	Specimen collection for Blood Culture	-	-	5
	2.	Inoculation of liquid & solid media	-	-	30
	3.	Identification test	-	-	30

	4.	Antimicrobial sensitivity testing-modified Kirby-bauer technique	-	-	30
	5.	IQC-Antibiotic disc potency	-	-	5
	6.	Operation of BacT/ALERT	-	-	20
	7.	Operation of Vitek 2 compact	-	-	20
	8.	Petroff's concentration technique	-	-	20
	9.	AFB culture & sensitivity	-	-	20
Mycology	1.	KOH wet mount	-	-	20
	2.	Germ tube test	-	-	20
	3.	Slide culture	-	-	20
	4.	Negative staining for fungus	-	-	5
	5.	LPCB mount	-	-	10
Parasitology	1.	Giemsa staining for thick & thin peripheral blood smear	-	-	-
	2.	Stool wet mount for R/M	-	-	30
	3.	Stool concentration techniques	-	-	5
	4.	Modified ZN staining for C.parvum	-	-	2
Serology / Immunology	1.	Phlebotomy & separation of serum	-	-	5

	2.	Operation & maintenance of mini-VIDAS	-	-	20
	3.	Operation & maintenance of ELISA reader & washer	-	-	20
		<b>Performance of serological tests</b>			
	1.	Latex agglutination test (RA, ASO, CRP)	-	-	30
	2.	RPR card test	-	-	30
	3.	Tube agglutination test	-	-	30
	4.	Gold conjugate rapid card test	-	-	30
	5.	ANA by IF	-	-	10
	6.	ANA by Immunoblot	-	-	10
	7.	IQC-serology	-	-	5

## V.TEACHING AND LEARNING METHODS

The training programme should be designed to enable the student to acquire a capacity to learn and investigate, to synthesize and integrate a set of facts and develop a faculty to reason. The curricular programme and scheduling of postings must provide the student with opportunities to achieve the above broad objectives. Much of the learning is to be accomplished by the student himself. Interactive discussions are to be preferred over didactic sessions. The student must blend as an integral part of the activities of an academic department that usually revolves around three equally important basic functions of teaching, research and service. As mentioned earlier, the emphasis recommended under a residency programme is of learning while serving/working.

### Post Graduate Training Programme Teaching Methodology

Based on the available facilities, the Department can prepare a list of post graduate experiments pertaining to basic and applied microbiology. Active learning should form the mainstay of post graduate training; there should be lectures for post graduates (at least 20 per year), along with seminars, symposia, group-discussions and Journal clubs. The post graduate students should regularly do the ward rounds

of various clinical departments and learn cases of interest for discussion with the clinical faculty. Each college should have a Medical Education Unit to generate teaching resource material for undergraduates and evolving of problem-solving modules.

**Rotation:**

**Postings to laboratories/assignments**

The three-year training programme for the MD degree may be arranged in the form of postings to different assignments/laboratories for specified periods as outlined below. The period of such assignments/postings is recommended for 35 months. Posting schedules may be modified depending on needs, feasibility and exigencies. For facilities not available in the parent institution as well as for additional knowledge and skill, extramural postings may be undertaken.

**Suggested schedule of rotation:**

Each candidate is posted to different sections on rotation. They should get acquainted with the basic microbiology for first three months. The next three months they are expected to submit a synopsis on dissertation topic that has been chosen by them.

**The posting schedule is given as follows**

**Within Department**

1. Bacteriology - 7 Months
2. Mycobacteriology - 3 Months
3. Serology/Immunology - 7 Months
4. Mycology - 3 Months
5. Virology - 3 Months
6. Parasitology - 3 Months
7. Media preparation - 4 Months

**Other Departments**

1. Clinical Pathology - 15 days
2. Clinical Biochemistry - 15 days
3. Skin & VD - 15 days
4. ICTC & RNTCP - 15 days

The students shall maintain a Log Book for the period of his/her postings to other departments Institutions and get the Certificate from the Departmental Head at the end of postings.

**Practical Training**

Practical training should be imparted by posting the students in various sub-(sections) as detailed in the intrinsic and extrinsic rotation. The student should be



actively involved in day to day working of all the sections. He/she should be trained under the guidance of teachers in all the aspects of Clinical Microbiology and applied aspects of laboratory medicine including collection and transport of specimens, receiving of samples, preparation of requisite reagents, chemicals, media and glassware, processing of specimens, performing required antimicrobial susceptibility testing and reporting on the specimens, interpretation of results, sterilization procedures, bio-safety precautions, infection control practices, maintenance of equipments, record keeping and quality control in Microbiology.

### **Skills & Performance**

The student should be given graded responsibility to enable learning by apprenticeship. The faculty throughout the year should assess performance of the student in skills. Area of improvement/remarks should be mentioned for the skill and student should be re-assessed for the skills which are not acquired. To go to the next level, it should be mandatory for the student to acquire lower level skills satisfactorily, i.e only on satisfactory completion of assisted/performed with assistance skills should the student be permitted to perform the skill independently.

### **Emergency Duty**

The student should be posted for managing emergency laboratory services in Microbiology. He/she should deal with all the emergency investigations in Microbiology.

### **DISTRICT RESIDENCY PROGRAMME (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as “**District Residency Programme (DRP)**” and the postgraduate medical student undergoing training shall be termed as a “**District Resident**”.

### **Communication and Attitudinal Skills**

Post-graduate student is expected to imbibe professional attributes of honesty, integrity, accountability, honor, humanism and excellence and demonstrate the same in the day-by-day conduct and dealings with the teacher, peers, the nursing and paramedical staff and most-importantly patients. To ensure that student is able to acquire these attributes, their personal conduct should be keenly observed by the teachers and student should be counselled as and when required. Personal attributes

of the student should be regularly assessed by peers, senior, and junior students and Head of the Unit/ In charge.

The following is a rough guideline to various teaching/learning activities that may be employed.

- Collection of specimens, smear examination, culture and sensitivity analysis
- Discussion during routine activities such as during signing out of cases.
- Presentation and work-up of cases including the identification of special stains and ancillary procedures needed.
- Clinico-microbiological conferences, active involvement with hospital infection control committee
- Intradepartmental and interdepartmental conferences related to case discussions.
- Conferences, Seminars, Continuing Medical Education (CME) Programme.
- Journal Club.
- Research Presentation and review of research work.
- A postgraduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- Participation in workshops, conferences and presentation of papers etc.
- Laboratory work.
- Use and maintenance of equipment.
- Maintenance of records. **Log books** should be maintained to record the work done which shall be checked and assessed periodically by the faculty members imparting the training.
- Postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- Department should encourage e-learning activities.

**During the training programme, patient safety is of paramount importance,**

therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.

Teaching methodology includes: (MCI)

1. **Didactic lectures**
2. **Seminar/journal club presentation (once a fortnight).**

Evaluation sheets may be incorporated for the purpose of assessment of presentations. The following points may be considered in the scheme for evaluation of presentations.

- Topic selection
- Completeness of presentation
- Clarity of presentation
- Understanding of the subject and ability to convey the same
- Whether relevant references have been consulted
- Ability to convey points in favor and against the subject under discussion
- Proper use of audio-visual aids o Ability to answer questions

3. **Case presentation, case work up, case handling/management (once a week)**

Each post graduate student in Microbiology presents an interesting case in clinical practice or in laboratory exercise of his or her choice

4. **Attending clinical grand rounds / clinic-pathological conference:** The post graduate students will encouraged to attend lectures and grand rounds offered by other clinical and basic science departments of the hospital.
5. **Attendance at Scientific meetings, CME programmes:** The post graduate students are expected to attend meetings related to Microbiology present papers/posters in these meetings.
6. **Quality performance meetings:** The post graduate students will attend meetings of hospital infection control committee, meetings to review HAI, and incidents, mortality meetings, audit related meetings.
7. **Paper/poster presentation:** A postgraduate student would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which will be published/accepted for publication/sent for publication during the period of

his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

8. **Teaching skills:** The postgraduate students will be required to participate in the teaching and training programme of undergraduate students and interns.
9. **A logbook:** will be maintained recording the duration of posting, the period of absence, if any, skills performed, and remarks if any by the teacher/faculty member. The logbook will also record journal clubs, seminars attended and partaken as well as undergraduate teaching activities the post graduate student has participated and will be signed by the faculty in charge
10. Department will encourage e-learning activities.

## **VI. RECOMMENDED READING**

### **Books (Latest edition)**

1. Forbes B, Sahm D, Weissfeld A Bailey and Scott's Diagnostic Microbiology, Mosby, St. Louis.
2. Koneman EW, Allen SD, Janda WM, Schreckenberger PC, Winn WC. Color Atlas and Textbook of Diagnostic Microbiology, J.B. Lippincott, Philadelphia.
3. Murray PR, Baron EJ, Pfaller MA, Tenover FC, Tenover FC. Manual of Clinical Microbiology, American Society for Microbiology.
4. Garcia LS, Bruckner DA. Diagnostic Medical Parasitology, American Society for Microbiology.
5. Wiedbrauk DL, Johnston SLG. Manual of Clinical Virology, New York, Raven Press.
6. Ivan Roitt, Essential Immunology
7. Topley & Wilsons Microbiology
8. Mackie & McCartney, Practical Medical Microbiology

### **Journals**

1. Indian Journal of Medical Microbiology (Indian)
2. Indian Journal of Pathology and Microbiology (Indian)
3. Indian Journal of Medical Research (Indian)
4. Infectious Diseases Clinics of N.A. (International)
5. Journal of Infectious Diseases (International)

6. Journal of Medical Microbiology (International)

## VII. ASSESSMENT

**FORMATIVE ASSESSMENT** i.e., during the training

Formative assessment will be continual and will assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

Thesis, Research work
Soft skills, Attitude, Ethics and Communication

Internal Assessment will cover all domains of learning and will be used to provide feedback to improve learning; it will also cover professionalism and communication skills. The Internal Assessment will be conducted in theory and practical examination.

**Quarterly Assessment during the MD training programme will be based on:**

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities /CMEs

**The student will be assessed periodically as per categories listed in postgraduate student appraisal form**

## VIII. POSTGRADUATE STUDENT APPRAISAL FORM

### Pre / Para / Clinical Disciplines

Name of the Department / Unit : \_\_\_\_\_  
 Name of the PG Student : \_\_\_\_\_  
 Period of Training : From \_\_\_\_\_ To \_\_\_\_\_

Sr. No	Particulars	Not Satisfactory			Satisfactory			More than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2	Patient based / Laboratory or Skill based learning										
3	Self directed learning and teaching										
4	Departmental and interdepartmental learning activity										
5	External and Outreach Activities / CMEs										
6	Thesis / Research work										
7	Log Book Maintenance										

Publications Yes / No

Remarks\* \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\*Remarks: Any significant positive or negative attributes of postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

Signature of Assessee

Signature of Consultant

Signature of HOD

## IX. SUMMATIVE ASSESSMENT

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000** as amended from time to time. The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

### **Eligibility :**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfill attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination , by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

### **The post-graduate examinations should be in three parts:**

#### **1. Thesis**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.

The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.

After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.

The student should submit 4 copies of the thesis along with one soft copy in CD/DVD **along with plagiarism clearance report (as per university regulations)** six months before the Theory and Clinical / Practical examination



Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and practical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

**The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.**

## **2. Theory Examination**

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% marks cumulatively in all the four papers and 50% marks in 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D. shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

**There shall be four theory papers, each of 3 hours duration:**

<b>Paper I:</b>	General Microbiology and Immunology
<b>Paper II:</b>	Systematic Bacteriology
<b>Paper III:</b>	Virology Parasitology and Mycology
<b>Paper IV:</b>	Applied Microbiology and Recent advances

The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.

Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.

The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.

### **Moderation of Question Papers :**

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

## Practical and Oral/viva voce Examination

### SCHEME OF EXAMINATIONS

#### Final Theory Examination at the end of THIRD YEAR

Paper	Title of Paper	Theory marks	Practical marks
	<b>Theory</b>		
1	General Microbiology and Immunology	100	-
2	Systematic Bacteriology	100	-
3	Virology Parasitology and Mycology	100	-
4	Applied Microbiology and Recent advances	100	-
	<b>Practicals &amp; Viva</b>	-	300
	Total	400	300
	<b>Grand Total</b>	<b>700</b>	

Paper	QUESTION PAPER PATTERN FOR THEORY EXAMINATIONS	MARKS
1	10 short answer questions x10 = 100 marks	100
2	10 short answer questions x10 = 100 marks	100
3	10 short answer questions x10 = 100 marks	100
4	10 short answer questions x10 = 100 marks	100
	<b>TOTAL</b>	<b>400</b>

## X. PRACTICAL/CLINICAL EXAMINATIONS

**Practical examination** will be conducted for two days include the following components as mentioned in the revised MCI curriculum:

Practical examination for the subjects in Basic Medical Sciences shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/Laboratory studies and his ability to perform such studies as are relevant to his subject.

The components shall be as specified in the subject BOS.

**Oral/Viva- Voce :** The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

### SCHEME OF MD (MICROBIOLOGY) PRACTICALS - MARKS DISTRIBUTION

(No. of days for practical exam: 2 days) 2019-20 Batch

PRACTICALS								GRAND TOTAL
DAY 1					DAY 2			
Exercise1	Exercise 2	Exercise 3	Exercise 4	Exercise 5	Exercise 6	Exercise 7	Pedagogy & VIVA	
50 marks	40 marks	25 marks	25 marks	25 marks	25 marks	10 marks	100 marks	300

<b>Exercise 1</b>	Isolation and Identification of Bacteria from Clinical Samples
<b>Exercise 2</b>	Identification of a pure culture.
<b>Exercise 3</b>	<ul style="list-style-type: none"> <li>• <b>Serology:</b> Common Serological Tests like ELISA/VDRL/Widal/Brucella Agglutination test etc.</li> </ul>

Exercise 4	<ul style="list-style-type: none"> <li>• <b>Virology:</b> <ol style="list-style-type: none"> <li>1. Preparation of tissue cultures</li> <li>2. Virus Titration</li> <li>3. Haemagglutination and its inhibition test</li> <li>4. Virus Neutralization Test</li> <li>5. Other rapid tests for diagnosis of viral infections</li> </ol> </li> </ul>
Exercise 5	<ul style="list-style-type: none"> <li>• <b>Mycology</b> <ol style="list-style-type: none"> <li>1. Identification of fungal cultures</li> <li>2. Slide culture techniques</li> </ol> </li> </ul>
Exercise 6	<ul style="list-style-type: none"> <li>• <b>Parasitology</b> <ol style="list-style-type: none"> <li>1. Processing and Identification of ova and cysts in stool samples</li> <li>2. Amoebic Serology</li> <li>3. Microscopic Slides</li> <li>4. Examination of histopathology slides for parasites</li> </ol> </li> </ul>
Exercise 7	<ul style="list-style-type: none"> <li>• <b>Spotters</b></li> </ul>
Oral/Viva-Voce Examination:	This must include a component of teaching session of not more than 15 minutes duration.

**Pass Minimum:**

**\*40% of marks in each theory paper in University Examinations and not less than 50% of marks cumulatively in all the four papers in the University Theory examinations in the aggregate → 200/400.**

**\*50% of marks in the University Practical, Oral and Pedagogy Examinations  
→150/300**

**\*50% aggregate in Theory, Practical, Viva Examinations → 350/700**

**\*Thesis (Pre-condition to appear for the final University Examination)**

**- Accepted**

## XI. SYLLABUS FOR EACH PAPER

### **Paper I: General Microbiology**

1. History of microbiology
2. Microscopy
3. Bio-safety including universal containment, personal protective equipment for biological agents
4. Physical and biological containment
5. Isolation precautions including standard precautions and transmission based precautions
6. Sterilization, disinfection and lyophilization
7. Morphology of bacteria and other microorganisms
8. Nomenclature and classification of microorganisms
9. Normal flora of human body
10. Growth and nutrition of bacteria
11. Bacterial metabolism
12. Bacterial toxins
13. Bacteriocins
14. Microbiology of hospital environment
15. Microbiology of air, milk and water
16. Host-parasite relationship
17. Antimicrobial agents and mechanisms drug resistance
18. Bacterial genetics and bacteriophages
19. Molecular genetics relevant for medical microbiology
20. Quality assurance and quality control in microbiology
21. Accreditation of laboratories

### **Immunology**

1. Components of immune system
2. Innate and acquired immunity
3. Cells involved in immune response
4. Antigens
5. Immunoglobulins

6. Mucosal immunity
7. Complement
8. Antigen and antibody reactions
9. Hypersensitivity
10. Cell mediated immunity
11. Cytokines
12. Immunodeficiency
13. Auto-immunity
14. Immune tolerance
15. MHC complex
16. Transplantation immunity
17. Tumor immunity
18. Vaccines and immunotherapy
19. Measurement of immunological parameters
20. Immunological techniques
21. Immunopotential and immunomodulation

**Paper II: Systematic bacteriology**

1. Isolation and identification of bacteria
2. Gram positive cocci of medical importance including Staphylococcus, Micrococcus, Streptococcus, anaerobic cocci etc.
3. Gram negative cocci of medical importance including Neisseria, Branhamella, Moraxella etc.
4. Gram positive bacilli of medical importance including Lactobacillus, Coryneform organisms, Bacillus and aerobic bacilli, Actinomyces, Nocardia, Actinobacillus and other actinomycetales, Erysipelothrix, Listeria, Clostridium and other spore bearing anaerobic bacilli etc.
5. Gram negative bacilli of medical importance including Vibrios, Aeromonas, Plesiomonas, Haemophilus, Bordetella, Brucella, Gardnerella, Pseudomonas and other non-fermenters, Pasteurella, Francisella, Bacteroides, Fusobacterium, Leptotrichia and other anaerobic gram negative bacilli etc.
6. Helicobacter, Campylobacter, Calymmatobacterium, Streptobacillus, Spirillum and miscellaneous bacteria
7. Enterobacteriaceae

8. Mycobacteria
9. Spirochaetes
10. Chlamydia
11. Mycoplasmatales; Mycoplasma, Ureaplasma, Acholeplasma and other Mycoplasmas.
12. Rickettsiae, Coxiella, Bartonella etc.

### **Mycology**

1. General characteristics and classification of fungi
2. Morphology and reproduction of fungi
3. Isolation and identification of fungi
4. Tissue reactions to fungi
5. Yeasts and yeast like fungi of medical importance including Candida, Cryptococcus, Malassezia, Trichosporon, Geotrichum, Saccharomyces etc.
6. Mycelial fungi of medical importance including Aspergillus, Zygomycetes, Pseudallescheria, Fusarium, Piedra, other dematiaceous hyphomycetes and other hyalohyphomycetes etc.
7. Dimorphic fungi including Histoplasma, Blastomyces, Coccidioides, Paracoccidioides, Sporothrix, Penicillium marneffeii etc.
8. Dermatophytes
9. Fungi causing Mycetoma, Chromoblastomycosis, Occulomycosis and Otomycosis.
10. Pythium insidiosum
11. Prototheca
12. Pneumocystis jirovecii infection
13. Rhinosporidium seeberi and Lacazia loboi (Loboaloboi)
14. Laboratory contaminant fungi
15. Mycetism and mycotoxicosis
16. Antifungal agents and in vitro antifungal susceptibility tests.

### **Paper III: Virology**

1. General properties of viruses
2. Classification of viruses

3. Morphology: Virus structure
4. Virus replication
5. Isolation and identification of viruses
6. Pathogenesis of viral infections
7. Genetics of viruses
8. DNA viruses of medical importance including Pox viruses, Herpes viruses, Adenoviruses, Hepadna virus, Papova and Parvo viruses etc.
9. RNA viruses of medical importance including Enteroviruses, Toga viruses, Flaviviruses, Orthomyxo viruses, Paramyxo viruses, Reo viruses, Rhabdo viruses, Arena viruses, Bunya viruses, Retro viruses, Filo viruses, Human immunodeficiency virus, Arbo viruses, Corona viruses, Calci viruses etc.
10. Slow viruses including prions
11. Unclassified viruses
12. Hepatitis viruses
13. Virioids, prions
14. Vaccines and anti-viral drugs.

### **Parasitology**

1. General characters and classification of parasites.
2. Methods of identification of parasites
3. Protozoan parasites of medical importance including Entamoeba, Free living amoebae, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium, Toxoplasma, Sarcocystis, Cryptosporidium, Microsporidium, Cyclospora Isospora, Babesia, Balantidium, etc.
4. Helminthology of medical importance including those belonging to Cestoda (Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Dipyllidium, Multiceps etc.), Trematoda (Schistosomes, Fasciola, Fasciolopsis, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis etc.) and Nematoda (etc. )
5. Entomology: common arthropods and other vectors viz. mosquito, sand fly, ticks, mite, cyclops, louse, myasis.
6. Anti-parasitic agents.

### **Paper IV: Applied Microbiology**

1. Epidemiology of infectious diseases



2. Antimicrobial prophylaxis and therapy
3. Hospital acquired infections
4. Management of biomedical waste
5. Investigation of an infectious outbreak in hospital and community
6. Infections of various organs and systems of human body viz. respiratory tract infections, urinary tract infections, central nervous system infections, congenital infections, reproductive tract infections, gastrointestinal infections, hepatitis, pyrexia of unknown origin, infections of eye, ear and nose, septicaemia, endocarditis, haemorrhagic fever etc.
7. Opportunistic infections
8. Sexually transmitted diseases
9. Vaccinology: principles, methods of preparation, administration of vaccines, types of vaccines
10. Information technology (Computers) in microbiology
11. Automation in Microbiology
12. Molecular techniques in the laboratory diagnosis of infectious diseases
13. Statistical analysis of microbiological data and research methodology
14. Animal and human ethics involved in microbiological work.
15. Safety in laboratory and Laboratory management

## XII LOG BOOK

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
(A University established by an Act of Andhra Pradesh Legislature)  
TIRUPATI - 517 507



## LOG BOOK

COMMON FOR MD/ DM/ M.Ch. POSTGRADUATES

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

## PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :

(Preferably be done by the faculty with whom the resident worked for mostpart of the period)

### **Quality parameters being assessed:**

1. Collection/transportation of specimens for microbiological investigations
2. Quality control of media, reagents etc.
3. Aseptic practices in laboratory and safety precautions.
4. Identification of bacteria of medical importance up to species level
5. Performance of antimicrobials susceptibility testing
6. Biomedical waste management
7. Academic Presentation
8. Punctuality / discipline

Signature of the candidate

Signature of the guide

Signature of the HoD  
with seal

**DETAILS OF POSTINGS OVER 3 YEARS**

**1st YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total:

Signature of Faculty:

**2nd YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

3rd YEAR From..... To.....

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

Signature of Faculty:

Thesis Topic:

Guide :

Co-Guides :

**SEMINARS / TOPIC REVIEWS PRESENTED**

<b>S. No.</b>	<b>Date</b>	<b>Topic</b>	<b>Role Presenter / Moderator</b>	<b>Signature of supervising Faculty</b>

**Guidelines for evaluation of Seminar Presentations**

<b>S.No.</b>	<b>Items for observation</b>
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**JOURNAL / TOPICS REVIEWED**

<b>S. No.</b>	<b>Date</b>	<b>Topic</b>	<b>Role Presenter / Moderator</b>	<b>Signature of supervising Faculty</b>

## Guidelines for evaluation of Journal Review Presentations:

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material, Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyze the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### CASES PRESENTED IN MORTALITY CONFERENCE

S. No.	Topic	Signature of supervising Faculty

### LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED

S. No.	Topic	Signature of supervising Faculty

**LAB/ INVASIVE PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>

**CONFERENCES ATTENDED**

<b>S. No.</b>	<b>Name</b>	<b>Role</b>	<b>Signature of supervising Faculty</b>

**PUBLICATIONS**

<b>S. No.</b>	<b>Topic</b>	<b>Journal</b>	<b>Role</b>

**BEDSIDE CASE DISCUSSION**

<b>S. No.</b>	<b>Date</b>	<b>Diagnosis</b>	<b>Signature of Faculty Presented to</b>



## SUMMARY OF LOG BOOK

(To be filled at the end of the course & retained in this book)

Name of the student : Admn.No.

Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_

Name of the Institute:

- 1) No. of Journal Review Presentations : Presented ..... Attended .....
- 2) No. of Seminar Presentations : Presented ..... Attended .....
- 3) No. of Clinical Presentations : Presented ..... Attended .....
- 4) No. of Case Presentations : Presented ..... Attended .....
- 5) No. of UG Teaching Programmes : Conducted ..... Attended .....  
(Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
- 6) No. of PG Teaching Programmes : Attended
- 7) No. of Investigative Procedures : Performed .....Assisted.....Observed...
- 8) No. of Major Operations / : Performed .....Assisted.....Observed...  
Procedures /  
Experiments
- 9) No. of Minor Operations / : Performed .....Assisted.....Observed...  
Procedures /  
Experiments
- 10) No. of Emergencies : Performed .....Assisted.....Observed...
- 11) No. of Medico-legal work : Performed .....Assisted.....Observed...
- 12) No. of Public Health Visit /  
Social work /  
Survey /  
Immunization /  
Camps
- 13) No. of Clinico-PathologicalConference : Presented ..... Attended.....
- 14) No.of special investigation / : Conducted ..... Attended .....
- Procedure
- 15) No. of events attended Conferences..... Symposia .....  
Workshops ..... CME .....
- 16) Any other activities :

Signature of the candidate

Signature of the guide

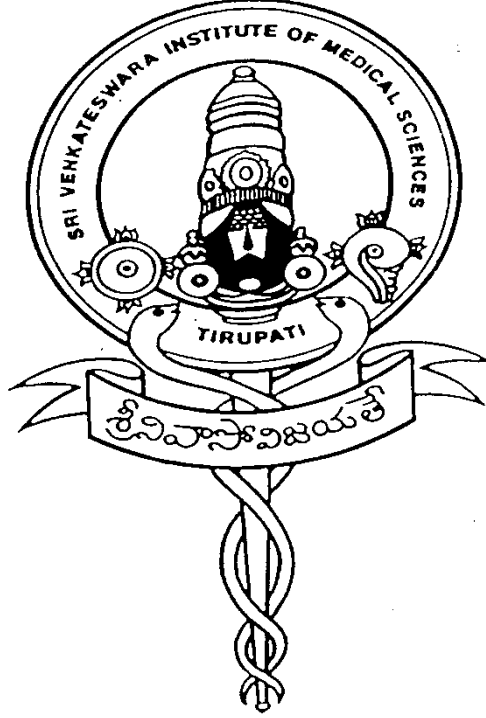
Signature of the  
HoD with seal

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES**

*(A University established by an act of Andhra Pradesh State Legislature)*

**TIRUPATI - 517 507**



**M.D. NUCLEAR MEDICINE COURSE**

**COMMON BOARD OF STUDIES MEETING**

**ON 21-07-2021**

**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**

**M.D. NUCLEAR MEDICINE COURSE**

**COMMON BOARD OF STUDIES MEETING ON 21.07.2021**

**I N D E X**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES::TIRUPATI**

**M.D (NUCLEAR MEDICINE)**

**COMMON BOARD OF STUDIES MEETING ON 21.07.2021**

List of Members

- |    |  |   |                            |
|----|--|---|----------------------------|
| 1. | Dr B. Siddhartha Kumar<br>Dean,<br>SVIMS, Tirupati.  | - | Chairman                   |
| 2. | Dr K.V. Sreedhar Babu<br>Registrar,<br>SVIMS, Tirupati.  | - | Member                     |
| 3. | Dr V. Suresh<br>Controller of Examinations,<br>SVIMS, Tirupati.                                | - | Member                     |
| 4. | Dr Dhanapathi Halanaik<br>Addl. Professor<br>Dept. of Nuclear Medicine<br>JIPMER, Pondicherry. | - | External expert            |
| 5. | Dr B.Vijayalakshmi Devi<br>Professor & I/C Head<br>Department of Radiology<br>SVIMS, Tirupati  | - | Internal expert            |
| 6. | Dr Tekchand Kalawat<br>Professor & Head<br>Dept. of Nuclear Medicine<br>SVIMS, Tirupati.       | - | Internal expert & convener |

# MD NUCLEAR MEDICINE COURSE

## THREE YEAR TRAINING PROGRAMME

### I. PREAMBLE

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. Nuclear medicine is a multi-disciplinary practice and the training of medical doctors is critical to the performance of a Nuclear Medicine department. Successful post graduate students are awarded a final certificate, degree or diploma that is recognized by the government, local health authority and hospital employer as an assurance of specialist competence in Nuclear Medicine. Post graduate training programme in Nuclear Medicine consists of an integrated training course of three years duration and would enable the post graduate student to practice nuclear medicine safely. The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

### II. AIMS & OBJECTIVES

#### **General:**

The aim of the post graduate training is to enable the trainee capable of practicing independently as a competent Clinical Nuclear Medicine Physician. The trainee should be compassionate and ethical in their practice of Nuclear Medicine diagnosis and therapy would also contribute to the future developments in Nuclear Medicine functional & molecular imaging and radionuclide therapies.

## **SUBJECT SPECIFIC LEARNING OBJECTIVES**

The **objective** of the programme is to enable the post graduate students to perform Nuclear Medicine practice, teaching and research independently and fulfill the manpower needs of ever-expanding new branch of diagnostic and therapeutic medicine.

**Post Graduate Training will consist of** Theoretical and Practical Training:

## **SUBJECT SPECIFIC COMPETENCIES**

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

### **A. Cognitive Domain:**

1. Should have knowledge of basic principles of radiation physics and its subsequent applications.
2. Should have knowledge of radiation protection principles.
3. Safe handling of radio nuclides and their disposal.
4. Should have knowledge of International Commission for Radiological Protection (ICRP) and National Regulatory guidelines pertaining to Nuclear Medicine practice.
5. Should have knowledge of diagnostic tests, interpretation of results and pitfalls.
6. Good clinical practice of therapeutic Nuclear Medicine and dosimetry.
7. Should be able to conduct clinical research and write a thesis/dissertation under supervision.
8. Should develop good working relationship with user specialties and handling inter-specialty referrals.

### **B. Affective domain:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

### **C. Psychomotor domain**

**At the end of the course, the student should have acquired the following skills:**

**A. Basic Sciences Experiment:**

1. Practical related to Physics, Instrumentation and its quality Control.
2. Preparation of radiopharmaceuticals and their quality control.
3. Detection of contamination in various work places.
4. Characterization of unknown isotopes.
5. Management of accidentals pillage.

**B. Clinical Experiment:**

1. GFR estimation.
2. Esophageal transit time.
3. Gastric emptying time.
4. Renal transplant evaluation.
5. Determination of ejection fraction and RWMA (wall motion).

**III. REGULATIONS**

a. **Title of the programme:** The programme shall be called M.D. (Nuclear Medicine)

b. **Eligibility of admission:**

A candidate seeking admission into the course shall have NMC recognized M.B.B.S. Qualification.

c. **Duration of the Course:**

The duration of the course shall be three academic years including the period of examination.

d. **Syllabus:**

The Board of studies shall prepare and approve syllabus. It shall review the same periodically as per the guideline of NMC.

e. **Admission:**

All candidates shall be admitted for MD Nuclear Medicine through NEETPG entrance examination test conducted by ministry of health, Government of India.

f. **Bond:**

After successful completion of the course, the Government candidate shall work as a Senior Resident or suitable post offered by the institute/Government subject to availability of the vacancy and requirement of the institute/Government as per the bond executed by the student.

g. **Procedure for Discontinuation:**

After closure of the admissions, the student will not be permitted to discontinue studies, unless he/she fulfils the bond executed by him/her.

**h. Eligibility for Examination:**

1. As per NMC, the period of training for obtaining MD, Nuclear Medicine degrees shall be three completed years including the examination period. The final examination shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, provided they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, provided they take no further leave other than eligible Casual/Special Casual leave. Otherwise, they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.



## 9. Teaching and learning methods:

Teaching methodology will be consisting of:

1. Didactic lectures in Physics related to Nuclear Medicine, radio pharmacy, radioisotopes techniques, instrumentation, data processing and quality control.
2. Participation in the daily routine work of the department including work rounds of patients admitted for radionuclide therapy.
3. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
4. Presentation of cases in the reporting sessions of the department.
5. Active participation in the combined clinical meetings and tumor board with other departments for case discussions.
6. Regular participation in department journal clubs, Seminars and other periodical

### 9A. The year-wise schedule of training will be as follows:

#### YEAR-1:

##### (A) Scientific principles:

- Basic physics and mathematics,
- Instrumentation,
- Principles of computing,
- Basic radiation biology and radiation protection,
- Basic radio pharmacy and radiochemistry,
- Principles of tracer technology.

##### (B) CLINICAL NUCLEAR MEDICINE:

- **Diagnostic:** Normal and abnormal appearances of images, mode of pharmaceutical uptake; normal variants and common artifacts in bone, heart, lung, kidney, brain, thyroid, tumor and infection images.
- **Therapeutic:** Basic principles of radionuclide therapy; treatment of hyperthyroidism, thyroid cancer and metastatic bone pain.
- **Principles of radiation protection:** ALARA (as low as reasonably achievable)

And ALARP (as low as reasonably practicable).

#### YEAR -2:

##### (A) Requirements of Year 1 in greater depth:

- Tracer kinetic:
- Computing and image processing;

- Radiobiology including the biological effects of high and low level radiation;
- Linear hypothesis and the threshold hypothesis of the biological response to low level radiation;
- The effective dose equivalent and the calculation of radiation dose from radio pharmaceuticals.

**(B) Radio pharmacy:**

- Properties of commonly used diagnostic and therapeutic radiopharmaceuticals;
- Production of radionuclides by reactors, cyclotrons and radionuclide generators;
- Quality assurance and quality control of radiopharmaceuticals.

**YEAR-3:**

**(A) Requirements of Year 2 in greater depth:**

- Principles of radiology including ultrasound, computerized tomography and magnetic resonance imaging.
- Co-registration of Nuclear Medicine images and those from other imaging techniques.
- Diagnostic: special investigations in cardiology, lung disease, gastroenterology, hepato-biliary diseases, nephron-urology, neurology and psychiatry, endocrinology, hematology, oncology and infection.

**(B) Therapeutic applications:**

- Treatment of bone metastases, neural crest tumors, prostate malignancies, solid malignancies;
- Use of radionuclide monoclonal antibodies and radionuclide labelled peptides for tumor therapy.

**(C) Further practice and experience of work accomplished in years 1 to 3:**

- Legal and regulatory requirements,
- Audit,
- Departmental management,
- Research techniques and evaluation,
- Teaching and training.

**9B. PRACTICAL TRAINING**

The post graduate students are obliged to play an active 'in-service' role in the practice of Nuclear Medicine to familiarize themselves with all the techniques required as a nuclear medicine practitioner, such as:

- Protocols of in vivo and therapeutic procedures;
- Data acquisition and processing with various equipment, quality control of instruments and labelled agents;
- Interventional procedures, including physiological, pharmacological, and mental stress for diagnostic application, and all therapeutic interventions;
- In vitro protocols and procedures.

### SCHEDULE FOR POST-GRADUATE TRAINING

<b>Subject</b>	<b>Duration (hrs)</b>	<b>Suggested content of teaching</b>	<b>Recommended practice and time period</b>
Nuclear physics	40	Decay features, spectrum, Radioisotope production & detection	Reactor-cyclotron generator, Radioisotope identification (5-7 days)
Radiochemistry	40	Labelling, technical design & quality control, interaction, kinetics	Synthesis, labelling, quality control, animal test (3-4 wks)
Radiobiology	40	Dosimetry, bio-modelling, tracer technology, radiation protection	Dosage-effect, molecular biology, radiation injury(4wks)
Instrumentation	100	Scintillating camera, SPECT, imaging procedure, computer	Daily operation and quality control, trouble shooting (4 wks.)
Related fields	50	Medical imaging modalities, epidemiology, statistics	Short round (6 wks.)
<b>Subject</b>	<b>Duration (hrs)</b>	<b>Suggested content of teaching</b>	<b>Recommended practice and time period</b>
Clinical use	240-300	Cardiology, neurology, GI tract, respiratory, endocrine, bones, haematology, tumour and infection	Clinical practice, image interpretation etc. (12-18 months)
In-vitro use	10	RAIU, RBC mass, survival, hypersplenism GFR measurements	RAIU practice (2 wks.) GFR estimation(4 wks.)
Therapy	60	RIT, palliation	Ward duty (3-4 months)

#### **9C. Rotation postings:**

Rotation in other departments as per the guidelines during 2<sup>nd</sup> year of training will be as follows:

- a) Radio-diagnosis                      03 months [02 months CTand01monthMRI]



## 5. External and Outreach Activities / CMEs

The results of the formative assessments shall be maintained in the student appraisal forms and in the same format will be communicated to the Examination section while applying for the summative examination.

Internal assessment theory and practicals - Twice yearly. Marks obtained will not be counted for the final examination.

## IV. SUMMATIVE ASSESSMENT & EXAMINATIONS

The summative assessment and examination would be carried out as per the Rules given in Postgraduate Medical Education Regulations, 2000 amended from time to time. University shall conduct maximum two examinations in a year, for MD Nuclear Medicine subject. In case there are two examinations in a given year, the interval between them shall be 4 to 6 months (minimum to maximum).

### **Format of Examination:**

Postgraduate examinations (MD Nuclear Medicine) shall consist of **Thesis, Theory Papers, clinical, practical and oral examinations.**

### **a) MD Nuclear Medicine Thesis:**

- Every candidate shall carry out work on an assigned research project under the guidance of a MD Nuclear Medicine recognized Post Graduate Teacher as per the norms laid down by NMC. , the result of which shall be written up and submitted in the form of a Thesis. The decision of the HOD concerned is final in allocation of guide to each post graduate.
- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.
- In the event of a registered guide leaving the institute for any reason or in the event of death, the guide, may be changed with prior permission from the Dean/or a committee constituted by Dean of the institute.
- Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the thesis protocol approval committee (TPC) constituted by the institution, during its meeting proposed to be held in the month of January each year.
- After obtaining approval from TPC, the thesis protocol shall be submitted in February to Institutional Ethics Committee (IEC) for clearance.

- The student should submit 4 hard copies of the thesis and one soft copy in the form of CD/DVD, six months before the Theory and Clinical / Practical examination.
- While submitting the thesis, the plagiarism clearance report to be attached as per the regulations of SVIMS university . (for detailed regulations see the Annexure - III)
- The thesis shall be examined by a minimum of three examiners; one internal and two external examiners (these external examiners) shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

**b) Theory examination for MD Nuclear Medicine:**

There shall be four theory papers, each of 3 hours duration. As per the NMC guidelines and BOS approved syllabus for MD Nuclear Medicine each paper shall be clear in title representing the training syllabus. As per the NMC guidelines Paper I shall be based on the basic science related to Nuclear Medicine curriculum and paper IV shall be based on the recent advances related to Nuclear Medicine.

The title of all theory papers shall be:

S. No.	Paper No.	Title
1.	Paper I	Basic Sciences related to Nuclear Medicine
2.	Paper II	Diagnostic Nuclear Medicine
3.	Paper III	Therapeutic Nuclear Medicine
4.	Paper IV	Recent advances in Nuclear Medicine

- The time duration of each paper will be 3 hours, each paper shall be assigned with total 100 marks, each paper will contain 10 questions of 10 marks each.
- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the Clinical/Practical and Oral examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.
- Moderation of Question Papers :

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

- One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
- Controller of Examinations
- Dean

**c) MD Nuclear Medicine Practical Examination:**

- Clinical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- Practical examination for the subjects in Basic Sciences related to Nuclear Medicine shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental study.
- **Oral / Viva-Voce:** The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty of Nuclear Medicine.

**Panel of Examiners:**

There shall be a panel of 8 external examiners from outside the state as advised by the Head of the department. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

**Appointment of Examiners:**

- No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
- For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State.
- Two internal examiners shall be appointed within the institution. If the internal examiners are not available within the institution, the institute can appoint any

eligible internal examiners as recommended by the HOD within the state or outside the state.

- An examiner shall ordinarily be appointed for not more than two consecutive terms
- The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

## 2. Number of Candidates:

The maximum number of candidates to be examined in Clinical / Practical and Oral on any day shall not exceed eight for M.D examinations or as specified by NMC.

## 3. Practical Examination:

Practical examination shall consist of one long case and two short case, clinical spots, basic science practical, basic science spots and Viva Voce with all together total 300 marks. Viva voce will be conducted by all examiners.

**Practical will include (with prescription of marks) as:**

S. No.	Examination details	Marks
1.	One long case (practical conduction of clinical investigation)	60
2.	Two short case (practical conduction of clinical investigation)	30 x 2 = 60
3.	Clinical scan (20 x 2)	40
4.	Basic science experiment	40
5.	Basic science spots (10 x 2)	20
6.	Grand viva voice	80
	Total	300

## 4. Marking System for the Examination:

- The examinations shall be organised on the basis 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for MD Nuclear Medicinedegree examinations.
- Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
- Award of Class:

Pass class : 50 to 74% of the aggregate marks

Distinction : 75% and above of the aggregate marks

Distinction shall be awarded only to the students who obtained 75% and above in the aggregate marks in the very first attempt



## **V. Syllabus for MD -Nuclear Medicine**

The broad outlines of the course contents are given below:

### **Course contents:**

The syllabus is divided into the following four parts:

1. Basic Science aspects of Radiation Physics and its application to diagnostic/ Therapeutic Nuclear Medicine
2. Diagnostic Nuclear Medicine and its applications
3. Therapeutic Nuclear Medicine and its applications
4. Recent Advances in Nuclear Medicine
5. At the end of the course, the student should have acquired knowledge in the following:

### **PART I: BASIC SCIENCE RELATED TO NUCLEAR MEDICINE**

#### **1.1 Radiation Physics and Instrumentation:**

- a. Structure of atom, Natural and artificial radioactivity.
- b. Modes of Radioactive decay.
- c. Interaction of radiation with matter.
- d. Principles of radiation detection and detectors.
- e. Basic principles of production of radionuclides by reactors and cyclotrons.
- f. Nuclear Medicine Instrumentation including Gamma Cameras, Single Photon Computed Tomography (SPECT), Positron Emission Tomography (PET), Hybrid Imaging Systems like SPECT/CT, PET/CT and PET/MR
- g. Counting Systems: Well counters, liquid scintillation counters, spectrometers, Radioactive Iodine Uptake (RAIU) probe and radiation monitoring devices.
- h. Quality control of Nuclear Instruments, as in (f and g).
- i. Collimation of radiation detectors and the characteristics of various collimators, their response to point, line and plane sources.
- j. Electronic instruments, such as pulse amplifiers, pulse height analyzer, count rate meters and computer interfaces including gating devices.
- k. Software and hardware fusion technology, Digital Imaging and Communications in Medicine (DICOM) technology and Picture Archiving and Communication System (PACS).

#### **1.2 Mathematics, Statistics and Computer Sciences:**

- a. Basic Mathematical concepts, counting statistics, probability distribution, Bayesian and McNemmar statistics, parametric and nonparametric statistics.
- b. Compartmental analysis and mathematical models of physiologic systems.
- c. Basic aspects of computer structure, function and programming.
- d. Computer applications with emphasis on digital image acquisition, analysis, processing and enhancement, tomographic reconstruction, display and recordings of findings.
- e. Fundamental of filters, their applications and uses.

### **1.3 Radiation Biology:**

- a. The biological effects of radiation exposure with emphasis on the effects of low level exposure.
- b. Methods of reducing unnecessary radiation exposure to patients, personnel and environment.
- c. ICRP recommendations and their amendments from time to time and other international recommendations, environmental regulations- regarding limits of radiation exposure, handling of radioactive patients, transport of radioactivity material and disposal of radioactive wastes.
- d. The diagnosis, evaluation and treatment of radiation over exposure in any form.

## **PART 2: DIAGNOSTIC NUCLEAR MEDICINE**

### **2.1 Radiopharmaceuticals**

The chemical, physical and biological properties of radiopharmaceuticals used in Nuclear Medicine investigations; production, Quality Control and Regulations of hospital based-Nuclear Pharmacy. The emphasis will be on:

- a. Physical and chemical characteristics of radionuclide used in diagnostic Nuclear Medicine.
- b. Criteria for selection of radionuclide for diagnostic purposes
- c. Biological behavior of radiopharmaceuticals
- d. Quality control
- e. Mechanism of localization
- f. Positron Emitting radio nuclides, target reactions and their radiopharmaceuticals chemistry, various synthetic modules.
- g. Specific topics on Radiopharmaceuticals: Bone seeking, hepato biliary, brain and cerebrospinal fluid (CSF), renal, thyroid, parathyroid, infection imaging, Tumor Seeking, cardiac imaging etc.
- h. Good Manufacturing Practice (GMP) and Laws pertaining to in-house manufacturing of Radiopharmaceuticals.
- i. Radiopharmaceuticals for Research.

### **2.2 In vivo Diagnostic Imaging**

- a. General clinical indications for organ imaging; normal and altered anatomy, physiology, biochemistry and metabolism of various organs. Must learn the technical

aspects of performing the procedures including proper patient preparation and patient management before, during and after the procedure.

- b. In vivo imaging and/or functional studies including brain Single Photon Emission Computed Tomography (SPECT), tracing of cerebrospinal fluid pathways, thyroid imaging, salivary glands, lungs, heart, gastrointestinal, hepatobiliary system, spleen, kidney, prostate, adrenal, bone and joints, bone marrow evaluation etc.
- c. The use of physiologic gating techniques for functional studies and patient monitoring during intervention, both physical exercise and using pharmacological stress agents
- d. Cellular kinetics, absorption and excretion analysis, nuclear hematology and metabolic balance studies using radiotracers.
- e. Comparative analysis of Nuclear Medicine procedures with X-ray, Ultrasound, Echo, MRI, CT and angiography etc. f. Nuclear Cardiology: Stress and redistribution studies using Thallium<sup>201</sup> and other technetium-based myocardial perfusion agents; myocardial viability, Gated SPECT studies, etc.
- f. Positron Emission Tomography (PET): All indications for use of PET imaging in oncology, cardiology, neurosciences and psychiatric disorders.

### **2.3 In vitro Studies:**

- a. Principles of Radioimmunoassay (RIA), quality control and data analysis for various hormones and drugs assays.
- b. Glomerular Filtration Rate (GFR) estimation, Red Cell Survival, Red Cell Mass using chromium and C14 urea Breath test.

## **PART 3: THERAPEUTIC NUCLEAR MEDICINE**

3.1 Principles of Internal Dosimetry: Calculation of the radiation dose from internally administered radionuclide

3.2 Characteristics of Radio nuclides/Radiopharmaceuticals for radionuclide therapy

3.3 Radiation protection in therapeutic set up: Design of Isolation ward as per the norms of Atomic Energy Regulatory Board (AERB)

3.4 Principles of OPD and in-door therapy administration

3.5 Therapy in thyroid disorders; benign thyroid diseases, etiology of hyperthyroidism, various modalities of treatment and follow up strategy, long-term outcome and various national and international regulations pertaining to therapeutic administration of radio nuclides.

Therapy in thyroid disorders; etiopathology, classification and diagnosis of thyroid nodules and malignancies-various modalities of treatment and follow-up strategies, long-term outcome and various national and international regulations pertaining to therapeutic administration of radio nuclides.

3.6 Bone pain palliation using various radio nuclides such as P<sup>32</sup>, Sr<sup>89</sup>, Y<sup>90</sup>, Sm<sup>153</sup>, Ra<sup>223</sup>, Lu<sup>177</sup> etc.

- 3.7 Radio synevectomy
- 3.8 Radio peptide therapy and Radio conjugate therapy
- 3.9 Radio immunotherapy
- 3.10 Loco regional internal radiation therapy
- 3.11 Research agents in radionuclide therapy

#### **PART 4: RECENT ADVANCES IN NUCLEAR MEDICINE**

Covering all aspects of the following areas:

- 4.1 Instrumentation
- 4.2 Radiopharmaceuticals
- 4.3 Diagnostic procedures
- 4.4 Therapeutic procedures

### **VI. Recommendations of Books & Journals**

#### **BOOKS:**

1. Principles of Nuclear Medicine by Henry N. Wanger (Jr.).
2. Pediatric Nuclear Medicine by James A.E. Wanger H.N. & R.E. Cooke.
3. Text book of Nuclear Medicine Technology by Paul J. Early, M. Razak et al.
4. Basic Science of Nuclear Medicine by Parker R.P. P.Poter, H.S, Smith Davidson.
5. Nuclear Cardiology, Principles & Methods by A.N. Serafini Albert J. Gilson William M. Smoak.
6. Therapy in Nuclear Medicine by Richard P. Spencer.
7. Computer methods- The fundamentals of digital medicine by David E. Liberman.
8. Radiopharmaceuticals by G. Subramanian, Rhodes B.A. et al.
9. Quality control in Nuclear Medicine radiopharmaceuticals, instrumentation & in-vitro assays by Butt A. Rhodes.
10. Radiation Protection- Guide for physician & Scientist by J. Shapire.
11. Nuclear Medicine-In-vitro by Benjamin Ruthfeld.
12. Radio Immunoassay & related technique, methodology & clinical applications by J.I. Thornell& S.M. Marson.
13. Nuclear Medicine, Endocrinology by Benjamin Ruthfeld.
14. Physics in Nuclear Medicine- Simon R Cherry, James A. Sorenson.
15. Nuclear Medicine- Robert E. Henkin.
16. Essential of Nuclear Medicine-F. A. Mettler.
17. Nuclear Medicine, Techniques & Technology- by Paul Chritian.
18. Nuclear Medicine Physics, The Basics-By Ramesh Chandra.
19. The pathophysiologic basis of Nuclear Medicine-by AbdelhamidAlgazzar.
20. Technetium<sup>99m</sup> Radiopharmaceuticals by I. Zole.
21. Positron Emission Tomography-Dale L. Bailey.
22. Pediatric Nuclear Medicine/PET-By S.T.Treves.

23. The requisites- Nuclear Medicine-by Harvey A.Ziessman.
24. Hybrid PET/CT and SPECT/CT imaging-by Dominique Delbeke.
25. Neuro PET, by Herholz
26. Molecular anatomic Imaging, by Von Schulthess
27. Principles and Practice of Nuclear Medicine, by Paul, J. Early, D. Bruce Sodee
28. Diagnostic Nuclear Medicine, by Sandler and Gottchalk
29. Nuclear Medicine in Clinical Diagnosis and Treatment, by Ell and Gambhir
30. Positron Emission Tomography, by Valk, Bailey, Townsend
31. Practical FDG Imaging A teaching File, by Debelke, Martin, Patton, Sandler.
32. Functional Cerebral SPECT and PE Imaging
33. CT and MR Imaging of the whole body, Haaga, Lanzieri, Gilkeson
34. Multi detector CT : Principle Techniques and Clinical Applications, by Fishman  
Jeffrey Normal Lymph node Topography 35.CT atlas, by Richter Feyerabind

#### **JOURNALS:**

1. Journal of Nuclear Medicine.
2. European Journal of Nuclear Medicine and molecular imaging.
3. International Journal of Nuclear Medicine& Biology.
4. Clinical Nuclear Medicine.
5. Journal of Labeled compounds & radiopharmaceuticals.
6. International Journal of applied radiation & Isotopes.
7. International Journal of Radiation Biology.
8. Indian Journal of Nuclear Medicine.
9. World journal of Nuclear Medicine.
10. Nuclear Medicine communication.
11. PET clinics.
12. Seminars in Nuclear Medicine.

## Annexure-I

### PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

#### MD Nuclear Medicine Postgraduate Students

#### Appraisal Form

Department of Nuclear Medicine

Name of the PG Student :

Period of Training : FROM..... TO.....

Sl. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
1	Journal based / recent advances learning	1 2 3	4 5 6	7 8 9	
2	Patient based /Laboratory or Skill based learning				
3	Self directed learning and teaching				
4	Departmental and interdepartmental learning activity				
5	External and Outreach Activities / CMEs				
6	Thesis / Research work				
7	Log Book Maintenance				

Publications

YES/ NO

Remarks\* \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

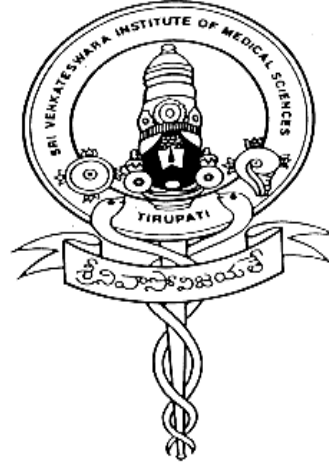
SIGNATURE OF HOD

Annexure-II

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,

(A University established by an Act of Andhra Pradesh Legislature)

TIRUPATI - 517 507



LOG BOOK

COMMON FOR MD/ DM/ M.Ch. POSTGRADUATES

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

### DETAILS OF POSTINGS OVER 3 YEARS

**1st YEAR**                      **From..... To.....**

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

Signature of Faculty :

**2nd YEAR**                      **From..... To.....**

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :



**3rd YEAR** From..... To.....

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

Signature of Faculty :

Thesis Topic:

Guide:

Co-Guides :

### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### Guidelines for evaluation of Journal Review Presentations

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material , Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyse the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:  
 Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**CASES PRESENTED IN MORTALITY CONFERENCE**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LAB / INVASIVE PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>

### CONFERENCES ATTENDED

S. No.	Name	Role	Signature of supervising Faculty

### PUBLICATIONS

S. No.	Topic	Journal	Role

### BEDSIDE CASE DISCUSSION

S. No.	Date	Diagnosis	Signature of Faculty Presented to

## SUMMARY OF LOG BOOK

(To be filled at the end of the course & retained in this book)

Name of the student : \_\_\_\_\_ Admn.No. \_\_\_\_\_

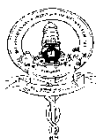
Name of the Course : \_\_\_\_\_ From: \_\_\_\_\_ To: \_\_\_\_\_

Name of the Institute: \_\_\_\_\_

- |   |   |                |
|---|---|----------------|
| 1) No. of Journal Review Presentations  | : Presented .....                         | Attended ..... |
| 2) No. of Seminar Presentations   | : Presented .....                         | Attended ..... |
| 3) No. of Clinical Presentations  | : Presented .....                         | Attended ..... |
| 4) No. of Case Presentations  | : Presented .....                         | Attended ..... |
| 5) No. of UG Teaching Programmes<br>(Theory class / Clinics / Practicals /<br>Demonstrations / Tutorials) | : Conducted .....                         | Attended ..... |
| 6) No. of PG Teaching Programmes  | : Attended                                |                |
| 7) No. of Investigative Procedures  | : Performed .....Assisted.....Observed... |                |
| 8) No. of Major Operations /<br>Procedures /<br>Experiments   | : Performed .....Assisted.....Observed... |                |
| 9) No. of Minor Operations /<br>Procedures /<br>Experiments   | : Performed .....Assisted.....Observed... |                |
| 10) No. of Emergencies  | : Performed .....Assisted.....Observed... |                |
| 11) No. of Medicolegal work   | : Performed .....Assisted.....Observed... |                |
| 12) No. of Public Health Visit /<br>Social work /<br>Survey /<br>Immunization /<br>Camps                  |   |                |
| 13) No. of Clinico Pathological Conference:   | Presented .....                           | Attended ..... |
| 14) No. of special investigation /<br>Procedure   | : Conducted .....                         | Attended ..... |
| 15) No. of events attended  | Conferences..... Symposia .....           |                |
|   | Workshops ..... CME .....                 |                |
| 16) Any other activities  | :   |                |

Signature of the Candidate \_\_\_\_\_ Signature of the guide \_\_\_\_\_

Signature of the HoD with seal \_\_\_\_\_



## Annexure-III

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**  
(A University established by an Act of A.P. State Legislature)

**GUIDELINES FOR 'PLAGIARISM' CHECK**  
**WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D students**

**Ref.:Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for ThefRses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

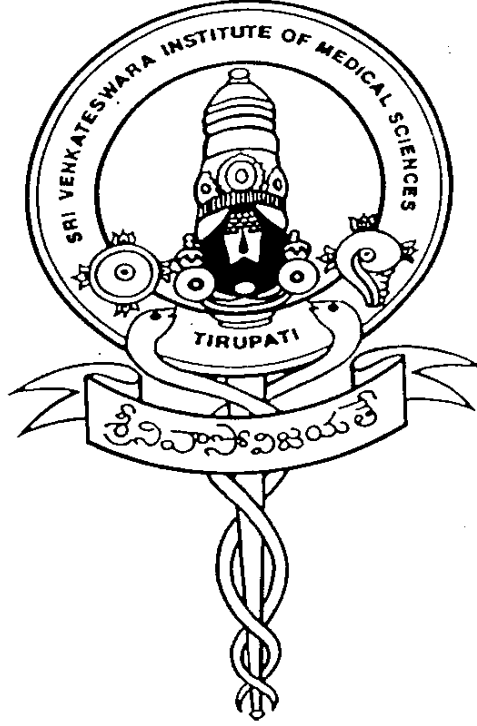
**Sd/- CONTROLLER OF EXAMINATIONS**

To: The HOD/Chief Guide Concerned for information and circulation among the respective students.

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI - 517 507**



**M.D. - PATHOLOGY**

**COMMON BOARD OF STUDIES MEETING**

**ON 21.07.2021**

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**TIRUMALA TIRUPATI DEVASTHANAMS**



**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUAPATI**

**M.D. (PATHOLOGY)**

**COMMON BOARD OF STUDIES MEETING ON 21/07/2021**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**

**M.D (PATHOLOGIST)**

**COMMON BOARD OF STUDIES MEETING ON 21.07.2021**

**List of Members:**

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2. Dr K.V. SreedharBabu - Member  
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3. Dr V. Suresh - Member  
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Professor & HoD  
Dept. of Cytology & Gynaec pathology  
PGIMER, Chandigarh  
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6. Dr N. Rukmangadha - Internal Expert  
Professor & HoD  
Dept. of Pathology  
SVIMS
7. Dr Aruna K Prayaga - Internal Expert  
Senior Professor  
Dept. of Pathology  
SVIMS

## **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PATHOLOGY**

### **I.PREAMBLE**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. This programme is meant to standardize Pathology teaching at post graduate level throughout the country so that it will benefit in achieving uniformity in teaching and resultantly creating suitable manpower with appropriate expertise. The post graduate student should be trained in handling and processing histopathology, clinical pathology, microbiology, biochemistry and transfusion medicine samples with a knowledge of general principles and methodology.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

#### **Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

**Attendance:** All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

## **DISTRICT RESIDENCY PROGRAMME (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme. This rotation shall be termed as "District Residency Programme (DRP)" and the postgraduate medical student undergoing training shall be termed as a "District Resident".

### **II.SUBJECT SPECIFIC LEARNING OBJECTIVES**

The learning objectives in the cognitive, psychomotor and affective domains are:

#### **A. Cognitive Domain**

1. Perform histopathology, cytopathology, haematopathology and Laboratory medicine (clinical pathology, clinical biochemistry) as well as blood banking(Transfusion medicine) evaluation of various specimens from patients for the routine and complex clinical problems
2. Interpret and correlate clinical and laboratory data so that clinical manifestations of diseases can be explained and diagnose routine and complex clinical problems
3. Advise on the appropriate ancillary tests/investigations necessary to arrive at a diagnosis in a problematic case.
4. Correlate clinical and laboratory findings with pathology findings at autopsy, identify miscorrelations and the causes of death due to diseases (apart from purely metabolic causes).
5. Teach Pathology to undergraduates, other peer postgraduates, nurses and paramedical staff including any other laboratory personnel.
6. Plan, execute, analyse and present research work.
7. Participate actively in the laboratory quality control exercise by making and recording observations systematically and maintain accurate records of tests and their results for reasonable periods of time. Identify problems in the laboratory, offer solutions thereof and maintain a high order of quality control.
8. Capable of safe and effective disposal of laboratory waste.
9. Able to supervise and work with subordinates and colleagues in a laboratory.

#### **B. Affective Domain**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

3. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

### **C. Psychomotor Domain**

1. Able to perform routine tests in a Histopathology Laboratory including grossing of specimens, processing, cutting of paraffin and frozen sections, making smears, and staining.
2. Able to collect sample/ specimens by routinely performing procedures such as venepuncture(for collection of blood samples), finger-prick, fine needle aspiration of palpable superficial lumps, bone-marrow aspiration, and provide appropriate help to colleagues performing an invasive procedure such as a biopsy or an imaging guided biopsy.
3. Perform an autopsy, dissect various organ complexes and display the gross findings.
4. Should be familiar with the function, handling and routine care of equipment's in the laboratory.

## **III.SUBJECT SPECIFIC COMPETENCIES**

### **A. Cognitive domain**

**A post graduate student upon successfully qualifying in the MD (Pathology) examination should have acquired the following broad theoretical competencies and should be:**

1. Capable of offering a high quality diagnostic opinion in a given clinical situation with an appropriate and relevant sample of tissue, blood, body fluid, etc. for the purpose of diagnosis and overall wellbeing of the ill.
2. Able to teach and share his knowledge and competence with others. The student should be imparted training in teaching methods in the subject which may enable the student to take up teaching assignments in Medical Colleges/Institutes.
3. Capable of pursuing clinical and laboratory based research. He/she should be introduced to basic research methodology so that he/she can conduct fundamental and applied research.

### **B. Affective domain**

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.

### **C. Psychomotor domain**

**At the end of the course, the student should have acquired skills, as**

**Surgical pathology/Histopathology Skills:** Given the clinical and operative data, the student should be able to identify, and systematically and accurately describe the chief gross anatomic alterations in the surgically removed specimens and be able to correctly diagnose at least 80% of the lesions received on an average day from the surgical service of an average teaching hospital.

A student should be able to demonstrate ability to perform a systematic gross examination of the tissues including the taking of appropriate tissue sections and in special cases as in intestinal mucosal biopsies, muscle biopsies and nerve biopsies, demonstrate the orientation of tissues in paraffin blocks.

The student should be able to identify and systematically and accurately describe the chief histo-morphological alterations in the tissue received in the surgical pathology service. He/she should also correctly interpret and correlate with the clinical data to diagnose at least 90% of the routine surgical material received on an average day.

Be conversant with automatic tissue processing machine and the principles of its running.

Process a tissue, make a paraffin block and cut sections of good quality on a rotary microtome.

**Stain paraffin sections with at least the following:**

- (i) Haematoxylin and eosin
- (ii) Stains for Collagen, Elastic fibres and Reticulin
- (iii) Iron stain
- (iv) Stains for mucins such as, Alcain blue, Periodic Acid Schiff stain and Mucicarmine stain
- (v) Staining different microorganisms including Acid fast stains (Different types of modifications) Gomorismethenamine stain etc.
- (vi) Congo red stain for Amyloid
- (vii) Any other stains needed for diagnosis.

**Demonstrate understanding of the principles of:**

- (i) Fixation of tissues
- (ii) Processing of tissues for section cutting
- (iii) Section cutting and maintenance of related equipment
- (iv) Cytochemical (special) stains and their utility

Cut a frozen section using cryostat, stain and interpret the slide in correlation with the clinical data provided.

**Immunohistochemistry:** Understand the principles of IHC various methods, able to perform manual IHC methods understand the various IHC markers and their use in specific clinical/Histopathological contexts, their interpretation and arrive at a diagnosis based on the observations.

**Cytopathology Skills:** Independently process various samples received in a cytopathology laboratory such as serous effusions, urine, bronchial washins, BAL fluid, sputum, CSF, cystic fluids, intra operative peritoneal fluid, scrape smears and any other specimen and make suitable smear preparations as per SOP. Prepare and apply routinely stains used in cytology such as Geimsa, MGG, H&E, and Papanicolaou stains on smears to obtain good quality smears for cytopathologic examination.

Be conversant with the appropriate techniques for concentration of specimens: i.e; various filters, centrifuge and cytocentrifuge.

Independently be able to perform fine needle aspiration of all lumps in patients and make good quality smears, collection material for appropriate ancillary studies as required in that case which may include cell block preparation, molecular studies and microbiological studies such as culture, gene expert, PCR etc.

**Given the relevant clinical data, he/she should be able to independently and correctly:**

- (i) Diagnose at least 75% of the cases received in a routine laboratory
- (ii) In exfoliative cytology and FNAC specimen categorize them into negative inconclusive and positive and as per current reporting systems and guide lines.
- (iii) Indicate correctly the type of tumour, if present
- (iv) Identify with reasonable accuracy the presence of organisms, fungi and parasites

**Haematology Skills: Correctly and independently perform the following special tests, in addition to doing the routine blood counts:**

- (i) Complete blood counts in a routine Haemogram including reticulocyte and platelet counts.
- (ii) Bone marrow staining and interpretation including iron stain
- (iii) ESR evaluation and interpretation
- (iv) Blood smear staining and interpretation
- (v) Cytochemical characterization of leukaemia with special stains like Peroxidase, Leukocyte Alkaline Phosphatase (LAP), PAS, Sudan Black, etc.
- (vi) Investigation and work up a suspected case of Haemolytic anaemia, including G6PD assay, HPLC, Hb electrophoresis etc.
- (vii) Coagulation profile including PT, APTT, FDP.

(viii) BM aspiration and BM biopsy

**Demonstrate familiarity with the principle and interpretation of results and the utility in diagnosis of the following:**

- (i) Platelet function tests including platelet aggregation and adhesion and PF3 release.
- (ii) Thrombophilia profile: Lupus anticoagulant (LAC), Anticardiolipin Antibody (ACA), Activated Protein C Resistance (APCR), Protein C (Pr C), Protein S (Pr S) and Antithrombin III (AT III)
- (iii) Immuno-phenotyping of leukaemia by flow cytometry
- (iv) Cytogenetics
- (v) Molecular diagnostics.

Describe accurately the morphologic findings in the peripheral and bone marrow smears, identifying and quantitating the morphologic abnormalities in disease states and arriving at a correct diagnosis in at least 90% of the cases referred to the Haematology clinic, given the relevant clinical data.

#### **Laboratory Medicine Skills:**

Plan a strategy of laboratory investigation of a given case, given the relevant clinical history and physical findings in a logical sequence, with a rational explanation of each step; be able to correctly interpret the laboratory data of such studies, and discuss their significance with a view to arrive at a diagnosis.

**Demonstrate familiarity with and successfully perform:**

- i) Routine urinalysis including physical, chemical and microscopic examination of the sediment.
- ii) Macroscopic and microscopic examination of faeces and identify the ova and cysts of common parasites.
- iii) A complete examination: physical, chemical & cell content of Cerebrospinal Fluid (C.S.F), pleural, Ascitic and peritoneal fluids.
- iv) Semen analysis.
- v) Examination of peripheral blood for commonly occurring parasites.

**Independently and correctly perform at least the following quantitative estimations by manual techniques and/or automated techniques.**



- (i) Blood urea
- (ii) Blood sugar
- (iii) Serum proteins (total and fractional)
- (iv) Serum bilirubin (total and fractional)

**Demonstrate familiarity with the following quantitative estimations of blood/serum by Automated Techniques:**

LFT panel

RFT panel

LIPIDOGRAM

Blood sugar, GTT, HBA1C,

Prepare standard solutions and reagents relevant to the above tests, including the preparation of normal solution, molar solution and buffers.

Explain the principles of Instrumentation, use and application of the instruments commonly used in the labs eg. Photoelectric colorimeter, Spectrophotometer, pHmeter, Centrifuge, Electrophoresis apparatus, ELISA Reader, flow cytometer, PCR, chemiluminiscence.

**Transfusion Medicine Skills: The student should be able to correctly and independently perform the following:**

Selection and bleeding of donors

Preparation of blood components i.e. Cryoprecipitate, Platelet concentrate, Fresh Frozen Plasma, Single Donor Plasma, Red Blood Cell concentrates.

ABO and Rh grouping.

**Demonstrate familiarity with Antenatal and Neonatal work up.**

- (i) Direct anti globulin test
- (ii) Antibody screening and titre
- (iii) Selection of blood for exchange transfusion

**Demonstrate familiarity with principle and procedures involved in:**

- (i) Resolving ABO grouping problems.
- (ii) Identification of RBC antibody.
- (iii) Investigation of transfusion reaction.
- (iv) Testing of blood for presence of:

- (a) HBV (Hepatitis B Virus Markers).
- (b) HCV (Hepatitis C Virus Markers)
- (c) HIV (Human Immunodeficiency Virus Testing)
- (d) VDRL
- (e) Malaria

### **Immunohistochemistry Skills (desirable)**

Be able to perform immuno-histochemical staining using paraffin section with at least one of the commonly used antibodies (Cytokeratin or LCA) using PAP method.

## **IV.SYLLABUS**

### **Course contents:**

The study of Pathologic Anatomy includes all aspects of Pathology as encompassed in the branches of General and Systemic Pathology.

**A) General Pathology:** Structure of Normal cell its organization into various tissues, their structures and function in normal physiological state. The changes in cellular structure and function in disease state is broadly the study of general pathology. Etiological causes of various diseases and their pathogenesis. Reaction of cells, tissues, organ systems and the body as a whole to various sublethal and lethal injuries. General Pathology is vast and the above is a guideline that in essence covers all aspects.

**B) Systemic Pathology:** The study of normal structure and function of various organ systems and the etiopathogenesis, gross and microscopic alterations of structure of these organ systems in disease and functional correlation with clinical features. All organ systems are to be studied. This forms the basis of Histopathology (Surgical Pathology), Cytopathology, Autopsy Pathology and Clinico-pathological correlation.

**C) Haematology:** The study of Haematology includes all aspects of the diseases of the blood and bone marrow. This would involve the study of the normal, and the causes of diseases and the changes thereof.

1. **Laboratory Medicine** (Clinical Biochemistry/Clinical Pathology including Parasitology).
2. **Transfusion Medicine** (Blood Banking).
3. The student is expected to acquire a general acquaintance of techniques and principles and to interpret data in the following fields.

- a) Immunopathology
- b) Electron microscopy

- c) Histochemistry
- d) Immunohistochemistry
- e) Cytogenetics
- f) Molecular Biology
- g) Maintenance of records
- h) Information retrieval, use of Computer and Internet in medicine.
- i) Quality control, waste disposal

Apost graduate is supposed to acquire not only the professional competence of a well-trained specialist but also academic maturity, a capacity to reason and critically analyse scientific data as well as to keep himself abreast of the latest developments in the field of Pathology and related sciences. A brief outline of what is expected to be learnt during the MD Course is given under each head.

### **Surgical Pathology**

**Knowledge:** The student should be able to demonstrate an understanding of the histogenetic and patho-physiologic processes associated with various lesions.

Should be able to identify problems in the laboratory and offer viable solutions.

Should be aware of the techniques of autopsy.

Should have sufficient understanding of various disease processes so that a meaningful clinico-pathological correlation can be made.

Demonstrate ability to perform a complete clinical autopsy independently with some physical assistance, correctly following the prescribed instructions. Correctly identify all major lesions which have caused, or contributed to the patient's death, on macroscopic examination alone and on microscopy in at least 90% of the autopsies in an average teaching hospital.

In places where non-medico-legal clinical autopsies are not available each student should be made to observe at least five medico-legal autopsies.

Write correctly and systematically Provisional and Final Anatomic Diagnosis reports.

### **Cytopathology**

**Knowledge:** Should possess the background necessary for the evaluation and reporting of cytopathology specimens.

**Demonstrate familiarity with the following keeping in mind the indication for the test.**

- (i) Choice of site from which smears may be taken
- (ii) Type of samples
- (iii) Method of obtaining various specimens (urine sample, gastric lavage, colonic lavage etc.)
- (iv) Be conversant with the principles and preparation of solutions of stains

## **Haematology Knowledge**

Should demonstrate the capability of utilising the principles of the practice of Haematology for the planning of tests, interpretation and diagnosis of diseases of the blood and bone marrow.

Should be conversant with various equipment's used in the Haematology laboratory.

Should have knowledge of automation and quality assurance in Haematology.

Correctly plan a strategy of investigating at least 90% of the cases referred for special investigations in the Haematology Clinic and give ample justification for each step in consideration of the relevant clinical data provided.

## **Laboratory Medicine Knowledge**

Possess knowledge of the normal range of values of the chemical content of body fluids, significance of the altered values and its interpretation.

Possess knowledge of the principles of following specialized organ function tests and the relative utility and limitations of each and significance of the altered values.

- (i) Renal function tests
- (ii) Liver function tests
- (iii) Pancreatic function tests
- (iv) Endocrine function tests
- (v) Reproductive function tests
- (vi) Tests for malabsorption

Know the principles, advantages and disadvantages, scope and limitation of automation in the laboratory.

Know the principles and methodology of quality control in the laboratory.

## **Transfusion Medicine (Blood Banking) Knowledge**

The student should possess knowledge of the following aspects of Transfusion Medicine.

Basic immunology

ABO and Rh groups

Clinical significance of other blood groups

Transfusion therapy including the use of whole blood and RBC concentrates

Blood component therapy

Rationale of pre-transfusion testing.

Infections transmitted in blood.

Adverse reactions to transfusion of blood and components

Quality control in blood bank

## **Basic Sciences (in relation to Pathology):**

### **a) Immuno pathology Knowledge:**

Demonstrate familiarity with the current concepts of structure and function of the immune system, its aberrations and mechanisms thereof.

Demonstrate familiarity with the scope, principles, limitations and interpretations of the results of the following procedures employed in clinical and experimental studies relating to immunology.

- ELISA techniques
- Radioimmunoassay
- HLA typing

Interpret simple immunological tests used in diagnosis of diseases and in research procedures.

- (i) Immuno-electrophoresis
- (ii) Immunofluorescence techniques especially on kidney and skin biopsies
- (iii) Anti-nuclear antibody (ANA)
- (iv) Anti-neutrophil cytoplasmic antibody (ANCA)

### **b) Electron Microscopy Knowledge**

Demonstrate familiarity with the principles and techniques of electronmicroscopy and the working of an electron microscope (including Transmission and Scanning Electron microscope: TEM and SEM) Recognise the appearance of the normal subcellular organelles and their common abnormalities (when provided with appropriate photographs).

### **c) Enzyme Histochemistry Knowledge**

Should be familiar with the principles, use and interpretation of common enzyme histochemical procedures (Alkaline Phosphatase, Acid Phosphatase, Glucose-6-Phosphate Dehydrogenase, Chloroacetate Esterase).

### **d) Immunohistochemistry Knowledge**

Demonstrate familiarity with the principles and exact procedures of various immune-histochemical stains using both PAP (Peroxidase-antiperoxidase) and AP-AAP (Alk.Phosphatase-anti-Alk.Phosphatase) ABC (Avidin-Biotin Conjugate) systems; employing monoclonal and polyclonal antibodies.

Be aware of the limitations of immuno-histochemistry.

### **e) Molecular Biology Knowledge**

Should understand the principles of molecular biology especially related to the understanding of disease processes and its use in various diagnostic tests.

Should be conversant with the principle and steps and interpretation of Polymerase Chain Reaction (PCR), Western Blot, Southern Blot, Northern Blot and Hybridisation procedures.

**f) Cytogenetics Knowledge**

Demonstrate familiarity with methods of Karyotyping & Fluorescent in-situ Hybridisation (FISH).

**g) Tissue Culture Knowledge**

Demonstrate familiarity with methods of tissue culture.

**h) Principles of Medical Statistics Knowledge**

Demonstrate familiarity with importance of statistical methods in assessing data from patient material and experimental studies.

**V. TEACHING AND LEARNING METHODS**

**Post Graduate Training**

**Teaching methodology**

Based on the available facilities, the Department will prepare a list of post graduate experiments pertaining to basic and applied Pathology.

Active learning will be the mainstay of post graduate training; there will be lectures for post graduates (at least 20 per year), along with seminars, symposia, group-discussions and Journal clubs. 1 seminar, 2 slide seminars, 1 small group discussion and 1 journal club per week.

The post graduate students will regularly do the ward rounds of various clinical departments and learn cases of interest for discussion with the clinical faculty.

<b>Academic Programme</b>	<b>No. of hours</b>
Journal presentation	43 hrs
Slide seminars	64 hrs
Small case discussions	22hrs
Topic seminars	43 hrs

**Rotation:**

**Postings to laboratories/assignments**

The three-year training programme for the MD degree will be arranged in the form of postings to different assignments/laboratories for specified periods as outlined below. The period of such assignments/postings is recommended for 35 months. Posting schedules will be modified depending on needs, feasibility and exigencies. For facilities not available in the parent institution as well as for additional knowledge and skill, extramural postings will be undertaken.

**Section/Subject      Duration in months**

(i)	Surgical Pathology, Autopsy & Pathology Techniques-----	12 months
(ii)	(ii) Haematology & Laboratory Medicine-----	10 months
(iii)	Cytopathology-----	07 months
(iv)	Transfusion Medicine/Blood Bank -----	01 months
(v)	Museum techniques & record management-----	15 days
(vi)	District hospital posting -----	03 months
(vii)	Special advance techniques including Immunopathology, Electron microscopy, Molecular Biology (RTPCR/PCR, Cytogenetics including FISH and any other Research Techniques-----	45 days

**Total ----- 35 months**

The training programme will be designed to enable the student to acquire a capacity to learn and investigate, to synthesize and integrate a set of facts and develop a faculty to reason. The curricular programmes and scheduling of postings will provide the student with opportunities to achieve the above broad objectives. Much of the learning will be accomplished by the student himself. Interactive discussions are preferred over didactic sessions. The student will blend as an integral part of the activities of an academic department that usually revolves around three equally important basic functions of teaching, research and service.

The following are the guidelines for teaching/learning activities that will be employed.

- Collection of specimens including Fine Needle Aspiration of lumps.
- Grossing of specimens.
- Performing autopsies.
- Discussion during routine activities such as during signing out of cases.
- Presentation and work-up of cases including the identification of special stains and ancillary procedures needed.
- Clinico-pathological conferences.
- Intradepartmental and interdepartmental conferences related to case discussions.
- Conferences, Seminars, Continuing Medical Education (CME) Programmes.
- Journal Club.
- Research Presentation and review of research work.

- A postgraduate student of a postgraduate degree course in broad specialities/super specialities will do one poster presentation, read one paper at a national/state conference and present one research paper which will be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him/her eligible to appear at the postgraduate degree examination.
- Participation in workshops, conferences and presentation of papers etc.
- Laboratory work.
- Use and maintenance of equipment.
- Maintenance of records. Log books to be maintained to record the work done which will be checked and assessed periodically by the faculty members imparting the training.
- Postgraduate students will participate in the teaching and training programme of undergraduate students and interns.
- Postgraduate students will get involved e-learning activities.

**During the training programme, patient safety is of paramount importance; therefore, skills will be learnt initially on the models, later performed under supervision followed by performing independently; for this purpose, accordingly skill laboratories are provided for the same.**

## **VI. ASSESSMENT**

### **FORMATIVE ASSESSMENT, ie., during the training**

Formative assessment will be continual and will assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

### **General Principles**

Internal Assessment will be frequent, cover all domains of learning and used to provide feedback to improve learning; it will also cover professionalism and communication skills. The Internal Assessment will be conducted in theory and practical/clinical examination once a year apart from assessment during topic seminar, journal club, slide discussions and small case group discussions.

### **Quarterly assessment during the MD training will be based on:**

- 1. Journal based / recent advances learning**
- 2. Patient based / Laboratory or Skill based learning**
- 3. Self-Directed learning and teaching**
- 4. Departmental and interdepartmental learning activity**
- 5. External and Outreach Activities / CMEs.**

**The student will be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)**



**Internal assessment :** Periodically theory as well as practical assessment of the candidate shall be done once in an year. The marks obtained in these examinations will not be considered for the university examinations.

**SUMMATIVE ASSESSMENT, i.e., Assessment at the end of training:**

The summative examination will be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 amended from time to time.

**Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination , by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three concerned examiners.
5. Online course on Basic Research Methods :

The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

## **FORMAT OF THE EXAMINATION:**

The Post Graduate examination shall consist of three parts; Thesis, Theory and Practical/Oral Examinations.

### **1. Thesis:**

Every post graduate student will carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which will be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.
- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.
- Thesis will be submitted at least six months before the Theory and Clinical / Practical examination.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II) .
- For MD/ MS Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.

- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

## 2. Theory:

There shall be four theory papers, each of 3 hours duration. Question paper pattern shall be 10 Questions of 10 marks each without choice.

### NAMES OF THE PAPERS:

**Paper I:** General Pathology, Pathophysiology & Immunopathology -----100marks

**Paper II:** Systemic Pathology (histopathology+ Cytopathology) -----100 marks

**Paper III:** Haematology, Transfusion Medicine (Blood Banking) and Laboratory Medicine-----100 marks

**Paper IV:** Recent advances and applied aspects-----100 marks

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.
- Moderation of Question Papers :  
A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;
  - One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
  - Controller of Examinations
  - Dean

## 3. Practical's/Clinical and Oral/viva voce:

Practical examination for the subjects in Basic Medical Sciences shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/Laboratory studies and his ability to perform such studies as are relevant to his subject.

The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

**The practical/clinical examination consists of the following and will bespread over two days.**

- i) **Clinical Pathology:** Discussion of a clinical case history. Plan relevant investigations of the above case and interpret the biochemistry findings. Two investigations has to be performed including at least one biochemistry exercise/clinical pathology exercise like CSF, pleural tap etc.analysis and complete urinalysis.
- ii) **Haematology:**2Haematology cases preferably haemolytic anaemia and 1 case pertaining to coagulationwill be discussed with the given relevant history. Student has to Plan relevant investigations, perform complete haemogram and at least two tests preferably including one coagulation exercise. Identify electrophoresis strips, osmotic fragility charts etc. Interpretation of data from auto analysers, HPLC and flow cytometry. Examine, report and discuss around 8 cases given the history and relevant blood smears and/or bone marrow aspirate smears and bone marrow biopsy interpretation.
- iii) **Transfusion Medicine:** Perform blood grouping. Perform the necessary exercise like cross matching, Coomb's testand gel cards interpretation.
- iv) **Histopathology & Cytopathology:**Examine, report and discuss 14 cases of histopathology and 8 cytopathology cases, given the relevant history and slides. Perform a Haematoxylin and Eosin stain and givenonespecial stain on a paraffin section. Should be conversant with histopathology techniques including cryostat.
- v) **Autopsy:** Given a case history and relevant organs without slides, give a list of anatomical diagnosis in autopsy case.
- vi) **Gross Pathology:** Describe findings of gross specimens, give diagnosis and identify the sections to be processed. The post graduate student will perform grossing in front of the examiners for evaluation.
- vii) **Anciliary techniques:** 10 spotters based on basic sciences will be included. Identify electron micrographs,Identify gels, results of PCR, immunological tests includinginterpretation of Immunofluorescence pictures. Identify histochemical and immuno-histochemistry stains.

Teaching exercise (pedagogy) 10 minutes

Practical exercises will be evaluated jointly by all the examiners (4).

**Oral/Viva Voce:**

An oral question-answer session will be conducted at the end of each exercise.

- (a) Viva on dissertation and research methodology
- (b) General Viva-Voce.

**Practical's& viva-voce -----300 marks**

- i) Autopsy----- 20 marks.
- ii) Gross specimens (4x5)----- 20 marks.
- iii) Histo-techniques( section cutting & H&E staining)--10 marks.
- iv) Special stain----- 5 marks.
- v) Pap stain ----- 5 marks.
- vi) Clinical pathology&Haematology-----25 marks.
- vii) Haematology slides ----8x5----- 40 marks.
- viii) Histopathology slides----14x5----- 70 marks
- ix) Cytology slides-----8x5----- 40 marks.
- x) Spotters ----- 20 marks.
- xi) Pedagogy----- 10 marks.
- xii) Thesis discussion----- 25 marks.
- xiii) General viva voce----- 10 marks.

Total marks (Theory+ Practical's)-----400+300 marks.

**Marking System for the Examination:**

- i) The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training.
- ii) Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
- iii) Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
- iv) Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

**Appointment of Examiners:**

- i) No person shall be appointed as an internal examiner in any subject unless he/she has 3yrs experienceas recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
- ii) If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
- iii) An examiner shall ordinarily be appointed for not more than two consecutive terms.

- iv) The internal examiner in a subject shall not accept external examiner ship for a college from which external examiner is appointed in his subject.
- v) For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .

There shall be a panel of 8 External Examiner as advised by the HOD concerned. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

### **Recommended Reading:**

#### **Books (latest edition)**

#### **General pathology:**

##### **i) Robbin's text book. Kumar, Abbas & Aster Surgical/Histopathology**

- Rosai and Ackerman's Surgical Pathology. John R.Goldblum, Lauraw. Lamps, Jesse k.Mckenney, Jeffrey L.Myers.
- Sternberg's Diagnostic surgicalpathology. Stacey E. Mills, Joel K.Greenon, Jason L.Hornick, Teri A .Longacre, Victor E.Reuter.

##### **ii) Systemic pathology(individual systems)**

- Lever's Histopathology of skin. Rosalie Elentases, MishaRosenbach, George F.Murphy, Adam I.Rubin,XiaoweiXu.
- Novak's Gynaecologic and Obstetric Pathology with Clinical and Endocrine Relations. Edmund R. Novak, James Donald Woodruff.
- Atlas and Text of Haematology by Tejinder Singh
- Orell's Atlas of Aspiration Cytology. Svante R Orell,Gregory F Sterrett
- Bone Pathology. Henry L. Jaffe
- Mac Sween's Pathology of the liver. Alastair Brut, Linda Ferrell, Stefan Hubscher
- Iochim's Lymph Node Pathology. Harry L. Ioachim, L.Jeffery Medeiros.
- Text Book on Breast Pathology. Fattaneh A.Tavasoli
- Text Book on Thyroid Pathology by Geetha Jayaram
- Theory and Practice of Histological Techniques by Bancroft. S. Kim Suvarna Christopher Layton John D. Bancroft.
- Diagnostic Cyto pathology. Winifred Gray, Gabrijela Kocjan.
- Dacie's Practical Haematology. Barbara Bain, Imelda Bates, Mike Laffan.
- Wintrobe's Haematology. John P Greer,Goerge M Rodger's, BertilGlader,Daniel A Arber, Robert T Means, Alan F List, Fredrick R Appelbaum,Angela Dis penzieri, Todd A Fehniger.
- Heptinstall's Pathology of the Kidney. J.Charlesjennette, Jean L.Olson,Fred G.Silva, Vivette D D'Agati.

- Enzinger's & Weiss's Soft Tissue Tumours. John R. Goldblum, Andrew L. Folpe, Sharon W. Weiss

**International Journals (3-5) & national (2) journals (All indexed)**

1. Lancet
2. New England Journal of Medicine
3. Nature science
4. Modern Pathology
5. American Journal of Surgical Pathology
6. Histopathology
7. Human Pathology
8. Journal of Pathology
9. ActaCytologica
10. Cancer cytopathology
11. Diagnostic cytopathology
12. Cytopathology
13. Journal of Clinical Pathology
14. Journal of cytology
15. Indian Journal of Pathology and Microbiology
16. British Journal of Haematology
17. Blood
18. Cancer.
19. All other relevant sub-speciality journals
20. WHO Blue books
21. AFIP Fascicles

**Annexure 1**

### Postgraduate Students Appraisal Form

Pre / Para / Clinical Disciplines

Name of the Department/Unit:

Name of the PG Student:

Period of Training: FROM.....TO.....

Sr. No	PARTICULARS	Not Satisfactory	Satisfactory	More than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1	1. Journal based / recent advances learning				
2	2. Patient based /Laboratory or Skill based learning				
3	3. Self directed learning and teaching				
4	4. Departmental and interdepartmental learning activity				
5	5. External and Outreach Activities / CMEs				
6	6. Thesis / Research work				
7	7. Log Book Maintenance				

Publications Yes/ No

Remarks\* \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD



Annexure - II  
Plagiarism  
**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**  
(A University established by an Act of A.P. State Legislature)

**GUIDELINES FOR 'PLAGIARISM' CHECK**  
**WHILE SUBMISSION OF THESIS/DISSERTATION BY**  
**DM/M.Ch/MD/MS/Ph.D students**

**Ref.: Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/MS/ DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for Theses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian,SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr A.Omkar Murthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.

6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga - INFLIBNET)
  - b. Second file: should contain the thesis from **“Introduction”** to **“Conclusion/result”** part of the thesis/dissertation (for plagiarism check)
  
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
  
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

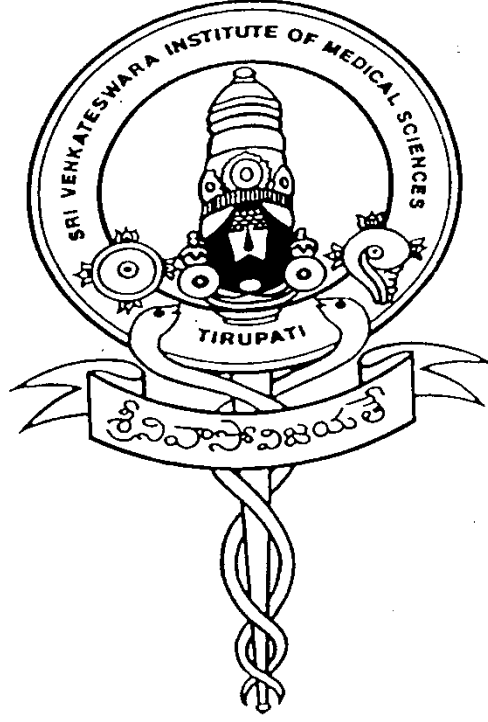
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## LOG BOOK

DATE	8-9AM	9-1PM	1-2PM	2--4PM
2-8-21	JOURNAL CLUB	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	MBBS Practicals/Grossing/BM aspiration/ Cytology reporting/MLT/Nursing/ Physiotherapy classes
3-8-21	HISTO SLIDE SEMINAR	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	MBBS Practicals /Grossing /BM aspiration/ Cytology reporting/MLT/Nursing/ Physiotherapy classes
4-8-21	TUMOR BOARD DISCUSSION	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	Grossing/BM aspiration/ Cytology reporting/ MLT/Nursing/ Physiotherapy classes
5-8-21	TOPIC SEMINAR	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	Grossing/BM aspiration/ Cytology reporting/ MLT/Nursing/ Physiotherapy classes/ CASE PRESENTATION
6-8-21	CYTO&HAEMAT O SLIDE SEMINAR/ SMALL CASE GROUP DISCUSSION	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	Grossing/BM aspiration/ Cytology reporting/ MLT/Nursing/ Physiotherapy classes
7-8-21	CLINICAL RESEARCH PRESENTATION	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	Grossing/BM aspiration/ Cytology reporting/ MLT/Nursing/Physiotherapy classes

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES  
TIRUPATI - 517 507**

(A University established by an act of Andhra Pradesh State  
Legislature)



**COMMONBOARD OF STUDIES MEETING**

**M.D. Radiotherapy**

**on 21.07.2021**

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**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES  
TIRUPATI**

M.D. RADIOTHERAPY COURSE

COMMONBOARD OF STUDIES MEETING HELD ON 21/07/2021

**I N D E X**

S.NO	Particulars	Page No.
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III	Assessment	08
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SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES:: TIRUPATI

MD Radiotherapy Course

COMMON BOARD OF STUDIES MEETING

List of members

1. Dr B. Siddhartha Kumar - Chairman  
Dean, SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar, SVIMS, Tirupati.
3. DrV. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr Joseph Benjamin - External expert  
Prof. & HoD  
Dept. of Radiotherapy  
MNJ Cancer Centre  
Red Hills, Hyderabad-500 080
5. Dr B.V. Subramanian - Internal expert  
Professor & HoD  
Dept. of Radiotherapy  
SVIMS, Tirupati
6. Dr Pranabandhu Das - Internal expert  
Associate Professor  
Dept. of Radiotherapy  
SVIMS, Tirupati

**GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING  
PROGRAMME FOR M.D., IN RADIOTHERAPY**

(As prescribed by MCI, 2018)

\*\*\*

**I. AIMS & OBJECTIVES**

**General:**

The aim of the training is to enable the trainee capable of practicing independently as a competent doctor. The trainee should be compassionate and ethical in their practice of oncology and would also contribute to the future developments in oncology.

**Specific:**

- a. The trainees should acquire a sound working knowledge of the use of ionizing radiation, cytotoxic agents, hormones, biological response modifiers, etc. in the management of cancer.
- b. The trainees practice "Evidence Based Medicine" whenever possible, and be familiar with Clinical Trial Methodology.
- c. The trainees should become competent in providing and organizing a comprehensive supportive and palliative care in patients with very advanced disease and in terminally ill patients.
- d. The trainees should develop the ability of reasoning/logical thinking and decision making in grey areas and in difficult cases.
- e. The trainees should become competent to provide guidance and leadership in the "Cancer Prevention Efforts".
- f. The training should generate awareness and interest in basic and applied cancer biology and whenever possible, experience in the field.
- g. The trainees should develop leadership qualities and learn basic management and administration skills.

The induction programme is intended to give the new trainees a general idea about SVIMS, the nature of work done in various departments and the location of various departments within the five inter connected buildings of SVIMS. The emphasis will be on the departments of Radiotherapy, Medical Physics and frequently used diagnostic and rehabilitative services. The Senior Registrar will introduce and guide the new students to various facilities listed below.

- 1) Teletherapy Machines (To know about the machines available in the hospital; Energy, accessories, types of treatment possible & operating.)
- 2) Brachytherapy Machines, Theatre (Types of procedure one LDR, HDR,

- Manual, Remote etc.; Care and special instruction taken during loading and removal of radioactive sources, Learn about radiation protection measures, know the procedures such as CVS,VSA and intracavitary).
- 3) Computer Treatment Planning, Physics (Simple plans, isodosecharts)
  - 4) Mould Room & Simulator (Making POP, a crylic and thermoplastic moulds, Alloy blocks, Styrofoamcutter, Tissue compensators, Bolus and surface moulds)
  - 5) Radiotherapy In-patients: (Visit towards, patient management with IV fluids, care of patients admitted towards, management of radiation reactions general aspects)
  - 6) Daycare: Various investigations, IV access & chemotherapy administration.
  - 7) Other rehabilitative services such as Palliative care, Occupation a land physiotherapy, Medical Social Workers
  - 8) Institutional Ethics Committee
  - 9) Radio-diagnosis department and Nuclear Medicine department
  - 10) Histopathology, microbiology, biochemistry and blood bank.
  - 11) Main operation theatre and ICU.

## II. REGULATIONS

- a) **Eligibility for admission:** A candidate seeking admission into the course shall have MCI / NMC recognized MBBS qualification.
- b) **Admission:** In order to be **eligible** for admission to any postgraduate course in a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in 'National Eligibility-cum- Entrance Test for Postgraduate courses' held for the said academic year.
- c) **All the students should get their degree registered with AP state medical council before completion of first semester.**
- d) **Duration of the course:** The duration of the course shall be three calendar years (including the period of examination).
- e) **Bond:**
  - i) The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/- value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. 5,00,000/- (**Rupees Five Lakhs only**) along with the full stipend amount received by him/her back to the Institute.



ii) The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.20,00,000 (Rupees Twenty lakhs only).

f) **Training Programme:** The candidate joining the course must work as full time Resident during the period of Post Graduate Training.

**Note:** In-Service candidate will not be paid stipend if He / She draws leave salary in that parent institution.

**g) Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

**h) Attendance:** All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

**PLAGIARISM**

Plagiarism- the thesis will be checked for plagiarism as according to University regulations

**Teaching/Learning Methods:**

Learning in MD (Radiotherapy) course shall essentially be self-learning.

**Group teaching sessions:**

- Journal review
- Subject seminar presentation
- Group discussion
- Clinical care presentations pertaining to Radiotherapy
- Presentation of the finding of an exercise on any of the sub-specialties
- Participation in CME programme and conferences
- Tumor board participation

- a) Lectures in Radiation Physics, Radiation Protection and Quality Control
- b) Case Discussions, Seminars, Journal Club Presentations, tumor board.

**Posting Schedule**

<b>I year</b>	<b>II year</b>	<b>III year</b>
Ward posting OPD posting	Ward posting OPD posting	Ward posting OPD posting
Peripheral posting	Simulator Planning & Brachy	Simulator Planning & Brachy

**1. Peripheral Postings**

**a) Internal:**

**During 1<sup>st</sup> year:** 1 month - which includes Medicine and Surgery 15 days each

**During 2<sup>nd</sup> year:** 2 months which includes Pathology, Nuclear Medicine, Radiodiagnosis, Medical Oncology - 2 weeks each

- b) **External:** During 2<sup>nd</sup> year 1 month external posting is allowed to a centre where the Cobalt unit and advanced facilities are available as per the decision of the HoD.

**c) DISTRICT RESIDENCY PROGRAMME (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as "District Residency Programme (DRP)" and the postgraduate medical student undergoing training shall be termed as a "District Resident".

2. **Hands on experience (practical training):**

Practical training shall be imparted by posting student in various subspecialties (sections) as detailed in the intrinsic and extrinsic rotation. Student shall be actively involve in day to day working of all the sections.

He/ She will be trained under the guidance of teachers in all the aspects of practice of Clinical Radiotherapy.

3. **Maintenance of Log Book:**

Each candidate should maintain a log book in which the following details will be entered:

1. Treatment planning and procedures performed
2. Presentation in departmental seminars
3. Cases presented in clinical meetings
4. Presentations in journal clubs along with Title, Journal & Issue..
5. Schedule of intradepartmental rotation
6. Details of peripheral postings
7. Conferences attended - National/International
8. Papers presented at conferences with title name of the conference, date of presentation
9. Paper published with title, name & issue of the journal

The log book shall be verified periodically i.e. once in a month or as per the MCI norms by the guide.

**III. ASSESSMENT**

**A. Formative assessment:**

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

**General Principles:**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching

4. Departmental and interdepartmental learning activity

5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form. The results of formative assessment should be maintained in the student appraisal form itself and communicated in the same format to the Examination Section while applying for the Summative Examination.

**Internal Assessment and evaluation:**

Internal assessment shall be in reality be done every day to assess the training and to identify the weakness as well as strength of the candidate.

- a) Log book with details of duration of postings, skills performed with remarks of the teacher faculty member
- b) The research work to be assessed or reviewed every six months
- c) Evaluation sheets for seminar and journal clubs
- d) Time scheduling
- e) Overall performance

**B. Summative Assessment :**

**Summative Assessment** ie., assessment at the end of training . The summative examination would be carried out as per the Rules given in Postgraduate Medical Education Regulations, 2000 as amended from time to time. The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

**Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms).An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall

attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfill attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.

**3. Paper publication:**

A postgraduate student would be required to present one poster presentation, to read one paper at a national / state conference and to present one research paper which should be published / accepted for publication / sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination as per MCI regulations amended from time to time.

4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three concerned examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

**IV. EXAMINATIONS**

The examinations shall be organized to evaluate and certify candidate level of knowledge, skill and competence at the end of the training. The examination for MD in Radiotherapy shall be held at the end of 3<sup>rd</sup> academic year

**Format of the Examination:**

Postgraduate examinations, in any subject shall consist of Thesis , Theory Papers, and Clinical/Practical and Oral examinations.

**1. Thesis:**

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the

latest advances in medical science and the manner of identifying and consulting available literature.

**Guide:**

The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

**Co-guide:**

- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the by the Head of the department. The co-guides shall be limited up to two numbers.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD with **plagiarism clearance** report as per university regulations(for detailed regulations see the Annexure -I).
- to the Controller of Examinations, six months before the Theory and Clinical / Practical examination. Those students who have not submitted the thesis as per regulations shall not be allowed to appear for the final examination.
- For MD/ MS Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical/ Practical & Viva examination. Internal examiner for thesis shall not be Guide or Co-guide for the thesis.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.

**2. Theory:**

i. There shall be four theory papers, each of 3 hours duration.

**Paper I-** Radiation Physics, Radiobiology, Basic Medical Sciences related to Oncology and Principles of Oncology

**Paper II -** Applied Clinical Radiotherapy

**Paper III-** Chemotherapy, Targeted Therapy in combination with Clinical Radiotherapy

**Paper IV-** Recent Advances in Radiotherapy and Oncology

**Model of the Examination:**

**New pattern:**

The pattern of the question paper is modified as follows for the students admitting from 2016-17 batch appearing the examination during May 2019.

**100 Marks for each paper**

**Each question carry 10 marks**

**No. of questions - 10**

**Choices - Nil**

**Paper I:** Radiation Physics, Radiobiology, Basic Medical Sciences related to Oncology and Principles of Oncology

**Paper II:** Applied Clinical Radiotherapy

**Paper III:** Chemotherapy, Targeted Therapy in combination with clinical Radiotherapy

**Paper IV:** Recent Advances in Radiotherapy and Oncology

ii) The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.iii) Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh **who may or may not be involved in the clinical/practical examination.**

iii) The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.

**iv) Moderation of Question Papers :**

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers

- One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
- Controller of Examinations
- Dean

### 3. Practical / Clinical

Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.

The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

The components of **Practical / Clinical examination:** (200 Marks)

**Long Case:** (100 Marks)

1. Case Documentation-----30 marks
2. Patient Examination -----30 marks
3. Differential Diagnosis-----10 marks
4. Case discussion----- 30 marks

**Short Case:** (50 Marks)

1. Case Presentation and examination----20 marks
2. Differential Diagnosis-----10 marks
3. Case discussion----- 20 marks

**Spotters- Identification and Description:** (50 Marks)

1. Pathological specimens-----10 marks
2. X-ray films, CT and MR Images----10 marks
3. Isodose charts-----10 marks
4. Cases-----10 marks
5. Instruments and Applicators-----10 marks

### 4. Oral/Viva (100 Marks)

The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination

### 5. Marking System for the Examination:

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.



3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

**6. Appointment of Examiners:**

1. All the Postgraduate examiners shall be recognized Postgraduate teachers holding recognized Postgraduate qualification in the subject concerned and satisfy the requisite experience as per MCI regulations amended from time to time.
2. The teachers in a medical college or institution having a total of 8 years teaching experience out of which at least 4 years teaching experience as Assistant Professor with two research publication in indexed journals gained after obtaining postgraduate degree shall be recognized post graduate teacher in broad specialties.
3. No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject.
4. For external examiners, he or she should have minimum 6 years of experience as recognized PG teacher in the concerned subject.
5. An examiner shall ordinarily be appointed for not more than 2 consecutive terms.
6. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.
7. For all post Graduate examinations, the minimum number of examiners shall be Four, out of which two (50%) shall be external examiners, who shall be invited from other recognized universities/institution from outside the state.
8. Two internal examiners will be appointed within the institution. If the internal examiners are not available within the institution, the institute can appoint any eligible internal examiners as recommended by the HOD within the state or outside the state.
9. Theory paper setting to be done by the examiners from outside the state of Andhra Pradesh who may or may not involved in the concerned Clinical / Practical examination.
10. No. of Examiners Required -Four  
    No. of Internal Examiners -Two (HoD and one eligible PG Teacher)  
    No. of External Examiners -Two
11. There shall be a panel of 8 External Examiner as advised by the HOD concerned.
12. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

## V. SYLLABUS

### FIRST YEAR

Candidates are expected to have wide knowledge of malignant diseases and the management of patients with cancer. The first year candidate also has good and depth in the knowledge of Physics and Radiobiology. Hence SVIMS university Department of Radiotherapy first year finishes Physics & Radiobiology.

#### MEDICAL PHYSICS RELATED TO RADIOTHERAPY

##### 1. BASIC CONCEPTS

Units - Rind mental units - Derived Units -Electrical Units - Radiation Units.  
Atoms - Nucleus - Atomic Number - Mass number - Isotope -  
NuclearStructure - energy levels Binding energy - electromagneticradiation -  
Quantum nature of Radiation - Radiation energy from anatom.

##### 2. NUCLEAR PHYSICS

Radio activity - Units of Activity - Exponential decay - half life -  
transformation constant - disintegration - Beta minus decay - Beta plus  
decay - Electron capture - Internal conversion - Auger electronic Isometric  
transitions - Fission - Fusion - Nuclear - reactors Activation of Isotopes.

##### 3. INTERACTION OF RADIATION WITH MATTER

###### (1) Photo interaction.

Absorption of energy - Linear attenuation - co - efficient - Half value layer -  
mass, electronic and atomic attenuation co - efficient - energy transfer and energy  
absorption - Photo electric absorption Compton scattering - pair production -  
total attenuation co - efficient - Relative importance of different types of  
interactions.

###### (2) Particle interaction

Electron interaction - Ionizational losses - Bremsstrahlung losses - Range of  
electrons -Electron - Electron spectrum - energy specification - stopping power -  
LET particles for radiotherapy.

##### 4. PRODUCTION OF X-RAYS

X-ray Production - X-ray circuit Diagnostic X - ray tubes X - ray tubes for  
Radiotherapy X- rays spectron - interactions of electron with the target  
Angular distribution of X- rays - quality of X - rays - filters - HVL.

##### 5. HIGH ENERGY MACHINES

Isotope machines – cobalt 60 unit source housing – beam Commission – penumbra cesium 137 – Betatron – Linear accelerator (detailed study) – microtron – Recent development.

## 6. RADIATION DOSIMETERY

Fluence – kerma and absorbed dose – electronic equilibrium – Bragg Gray cavity principl. Exposure – Roentgen standard air chamber – Thimble chamber – condenser chamber – Farmer – chamber – Secondary standard doscimeter – Inverse square law – Thermoluminescent doscimeter – Chemical doscimeter – film as a doscimeter.

## 7. BEAM THERAPY

Phantoms percentage depth dose – Tissue air ratio – Back scatter factor – Tissue Phantom rations – Tissue maximum ratios – equivalent squares for rectangular fields – Isodose curves – Paramelions and Iso Dose energy – Comparison of Isodose curve of cobalt 60 with high energy beams – wedge filters – integral dose – choice of radiation beam.

## 8. TREATMENT PLANNING

Patient dose calculation – treatment time calculation – SSD and SAD Technique – Body contours – centours – corrections – for tissue in homogeneities – corrections for surface obliquities – tissue compensators. Dose distribution – opposing pairs of beams – three field techniques – Rotation therapy – Wedge pairs – open and wedge field combinations. Preparation of mould – shielding blocks – Styrofoam cutting machine – simulator and its application – Role of CT and Ultrasound in treatment planning.

## 9. BRACHYTHERAPY

Brachytherapy sources Radium 226 – cesium 137 – cobalt 70 – Iridium 192 – Gold 198 – Iodine 125 – Physical characteristics – source production – storage and transport facility. Implant technique – types of implant – Patterson – parker system – Patterson – parket tables – determination of implant area – radiographic examination of implants – orthogonal imaging method stereo shift method – After leading technique Iridium 192 implant permanent implants – clinical examples of dose calculation. Intracavitary application – paris technique – Stockholm technique – Manchester system – Dose specification – Point A and Point B – leading arrangement – Applications – Manual after leading systems – Computer Dosimetry – examples of dose calculation. Recent developments in Brachytherapy.

## 10. RADIATION PROTECTION

Biological effects of radiation – sematic and Genetic effects – immediate and late effects – evaluation of radiation hazards – personnel monitoring – film badge

pocket decimeter – TLD – Area monitoring survey meters – survey procedures – quality assurance in radiotherapy.

Maximum permissible dose – historical review – Radiation protection rules in India – ICRP recommendations – dose equivalent Limits – quality factor – Sivertz.

Planning of Radiotherapy department – work load – occupancy factor – use factor – protection from primary radiation protection against leakage radiation and scattered radiation – Design considerations for accelerator facility.

Guidelines for safe work practice – recent development in radiation protection.

### PHYSICS PRACTICALS

1. Range of beta particles.
2. Gamma ray spectrum.
3. Output measurement in a Linear accelerator.
4. Determination of optical and radiation field congruence.
5. Rectal Dose measurement.
6. Verification of Inverse square law.
7. Familiarization of computerized treatment planning system.
8. Familiarization of simulator.
9. Radiation survey in a Teletherapy facility.
10. Radiation survey a Branchy therapy facility.
11. Dose simulation in multi field with open field and wedge fields.
12. Quality assurance in Radiotherapy.
13. Uptake studies with Gamma camera and scanners.

### CLINICAL PRACTICES OF RADIOTHERAPY

- A. Principles of Radiotherapy
- B. Techniques of Radiotherapy
- C. Effects of Irradiation of the Lung
- D. Effects of Irradiation of Nervous Tissues
- E. Effects of Irradiation of the Ovary
- F. Effects of Irradiation of the Testis
- G. Effects of Irradiation of the Eye
- H. Effects of Irradiation of Lymphoid Tissue
- I. Effects of Irradiation of the Bone Marrow
- J. Effects of Irradiation of the Oral, Pharyngo laryngeal and Esophageal Mucus Membrane
- K. Effects of Irradiation of the Salivary Glands

RADIOBIOLOGY

1. Radiobiology and Laboratory Radiotherapy
2. Factors That Modify Radiation Response
3. Linear Energy Transfer
4. Relative Biological Effectiveness
5. Cell and Tissue Kinetics
6. Tissue Radio sensitivity
7. Time - Dose and Fractionation
8. Hyperthermia
9. Total Body Irradiation - Acute Effects
10. Late Effects
11. Radiation Effects in the Developing Embryo and Fetus
12. Radio physiology of Human Tissues

SECOND YEAR

2. PRINCIPLE OF ONCOLOGY

2.1 Etiology of Cancer

- a) Genetic predisposition, congenital syndromes
- b) Chromosomal abnormalities, hereditary tumors
- c) Proto-oncogene, oncogenes, tumor suppressor genes,
- d) Multifactorial causation
- e) Nutritional aspects in cancer causation and prevention.
- f) Environmental causes of cancer
- g) Biological - protozoal, bacterial, viral
- h) Chemical - Classes of carcinogenic chemicals, smoking
- i) Physical - trauma, irradiation (UV rays, other electromagnetic radiation including X rays and Gamma rays and particulate radiations)
- j) Occupational cancers.

2.2 Epidemiology of Cancer

2.3 Cancer Screening and Prevention

2.4 Cancer Registries & National Cancer Control Programme

## 2.5 Cancer Chemotherapy

- a) Classification and mode of action of cytotoxic drugs
- b) Pharmacokinetics and Pharmacodynamics
- c) Principles of combinations of therapy, dose response curves, sequential and concomitant chemotherapy, sanctuary sites, high dose chemotherapy, and regional chemotherapy
- d) Standard chemotherapy schedules
- e) Drug administration and Precautions in the safe handling of cytotoxic drugs
- f) Drug Toxicity
- g) Supportive care for chemotherapy
- h) Resistance to Chemotherapy
- i) Basic concepts of Chemotherapy and Irradiation Interaction

## 2.6 Cancer Bio therapeutics

- a) Hormonal Therapy
- b) Differentiation Agents
- c) Monoclonal Antibodies
- d) Interferons
- e) Interleukins
- f) Anti angiogenesis Agents
- g) Molecular Targeted Therapy
- h) Vaccines
- i) Gene Therapy

## 2.7 Imaging in Oncology

## 2.8 Pharmacogenomics

### THIRD YEAR

## 3. CLINICAL RADIOTHERAPY, CHEMOTHERAPY AND TARGETED THERAPY IN MANAGEMENT OF MALIGNANCIES

- 3.1 Skin Cancer
- 3.2 Central Nervous System Tumor
- 3.3 Head and Neck Tumors
- 3.4 Thoracic Tumors
- 3.5 Breast Tumors
- 3.6 Gastrointestinal Tumors
- 3.7 Liver, Gall bladder and bile duct tumors
- 3.8 Pediatric Tumors

- 3.9 Gynecologic Tumors
- 3.10 Male Genitourinary Tumors
- 3.11 Urinary Tract Tumors
- 3.12 Endocrine Tumors
- 3.13 Lymphoma and Hematological Malignancies
- 3.14 Sarcomas of Bone and Soft tissues
- 3.15 Metastasis of Unknown Origin
- 3.16 AIDS related Malignancies
- 3.17 Oncologic Emergencies
- 3.18 Endocrine aspects of malignancy:- production of hormones by tumors, effect of hormones on tumors, paracrine effects of tumors
- 3.19 Paraneoplastic syndromes
- 3.20 Benign Diseases

#### 4. OTHER DISCIPLINES ALLIED TO RADIOTHERAPY AND ONCOLOGY

- 4.1 Surgical Oncology
  - 4.1.1 Basic principles of surgical oncology, biopsy, conservation surgery, radical surgery, palliative surgery
  - 4.1.2 Basics of surgical techniques - head & neck, breast, thorax, abdomen, gynecological, genitourinary, musculoskeletal, CNS
  - 4.1.3 Combined treatments: with radiotherapy, chemotherapy, and hormone therapy
- 4.2 Rehabilitation
- 4.3 Complementary alternative medicine

#### 5. PALLIATIVE CARE

- 5.1 Guidelines for palliative care
- 5.2 Symptoms of advanced cancer
- 5.3 Different pharmacologic & non-pharmacologic methods
- 5.4 Pain control, WHO guidelines for adults & children
- 5.5 Palliative radiotherapy
- 5.6 Palliative chemotherapy
- 5.7 Home care
- 5.8 Hospice care
- 5.9 Physical, social, spiritual & other aspects

#### 6. RESEARCH, TRAINING & ADMINISTRATION

- 6.1 Research in Oncology
  - 6.1.1 How to conduct a research

- 6.1.2 Guidelines for biomedical research: Animal studies, drug studies, human trial
- 6.1.3 Cancer clinical trials. Phase I/II, III
- 6.1.4 Ethics of clinical research
- 6.1.5 Evidence based medicine
- 6.2 Training Programme in Radiotherapy and Oncology
  - 6.2.1 Participation in the daily routine work of the department including work rounds of patients admitted for radiotherapy, symptomatic treatment for acute and late radiation reactions, administration of cytotoxic drugs, management of chemotherapy induced side effects and complications, cancer pain management and palliative care .
  - 6.2.2 Presentation of cases in the reporting sessions of the department
  - 6.2.3 Participation in various procedures and techniques (e.g. External Beam Radiotherapy- 2-D & 3- DCRT, IMRT; Brachytherapy- Interstitial, Intracavitary, Intraluminal, Surface; Simulation and Treatment Planning; Mould Room Procedures etc.)
  - 6.2.4 Active participation in the Tumor Board meetings with other departments for case discussions.
  - 6.2.5 Junior Residents in Radiotherapy must undergo 3 months peripheral postings in other specialities during their 3 years course towards M.D.
  - 6.2.6 Participation in CME-conference, symposium, workshop, seminar
  - 6.2.7 Active participation in teaching and training programme of undergraduate students.
- 6.3 Administration in Radiotherapy and Oncology
  - 6.3.2 Clinical Oncologist's role as an administrator.
  - 6.3.3 How to set up a Radiotherapy and Oncology department, planning of infrastructure, & equipments
  - 6.3.4 Role in cancer control programme.
  - 6.3.5 Responsibilities towards radiation safety & quality assurance.
  - 6.3.6 Administration aspects of training, academic, patient care & research.



VI. Model Question Paper

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI  
UNIVERSITY EXAMINATIONS

M.D. - RADIOTHERAPY

Paper 1: Radiation Physics, Radiobiology, Basic Medical Sciences related to  
Oncology And principles of Oncology

Date: 15.4.2021      Time; 3 Hours      Code; 47301      Maximum Marks: 100

**Instructions to the doctors: Answer all questions.  
Draw neat and labeled diagrams where necessary**

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- 1). Discuss the methods employed for immobilization of patient in Radiotherapy treatment planning 10
- 2.) What is universal wedge. Discuss physical aspects & clinical application of wedge filter . 10
- 3.) What are early & late reacting tissues & discuss LQ model along with clinical significance. 10
- 4).Discuss the biological factors determining the response of a tumor to radiation treatment. 10
- 5). What is percentage depth dose & factors influencing it. 10
- 6).What are the various interaction of radiation with matter . 10
- 7). Describe DNA damage by radiation. Define Radio sensitivity & radio curability. 10
- 8).Write notes on therapeutic radio, dose time factors & its impact on local tumor control 10
- 9). Enumerate the differences between LINAC & cobalt-60 Radiotherapy machine. 10
- 10). Define hyper fractionation & its radio biologic rationale. 10

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI  
UNIVERSITY EXAMINATIONS  
M.D. - RADIOTHERAPY**

**Paper 2: Applied Clinical Radiotherapy**

**Date: 17.4.2021      Time; 3 Hours      Code; 47302      Maximum Marks: 100**

**Instructions to the doctors: Answer all questions.  
Draw neat and labeled diagrams where necessary**

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- |  |    |
|--|----|
| 1). Discuss the management of Ca. Tonsil cT3N1MO   | 10 |
| 2). Discuss the Breast Conservation therapy in 40 years old female cT2NOMO                     | 10 |
| 3). Discuss the management of Ca. Cervix IIIB  | 10 |
| 4).Anatomy of maxillary antrum. Discuss the management of cT4N1MO of<br>Ca. Maxilla            | 10 |
| 5).Cranio Spinal irradiation   | 10 |
| 6). What is the role of RT In treatment of Ca Esophagus. Discuss technique of<br>RT in detail. | 10 |
| 7). Write short notes on :<br>a) Radiation cystitis<br>b) Radiation proctitis                  | 10 |
| 8). Treatment of Stage IV non small cell Lung cancer.  | 10 |
| 9). Role of RT in Benign diseases .  | 10 |
| 10). Discuss the role of RT in Ca Anal canal. Add a Note on ACT-I & ACT-2 trial.               | 10 |

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUPATI  
UNIVERSITY EXAMINATIONS  
M.D. - RADIOTHERAPY**

**Paper 3: Chemotherapy, targeted therapy in combination with clinical radiotherapy**

**Date: 19.4.2021      Time; 3 Hours      Code; 47303      Maximum Marks: 100**

**Instructions to the doctors: Answer all questions.**

**Draw neat and labeled diagrams where necessary**

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- 1). Write about indication, administration, side effects of cisplatin 10
- 2). Write about indications, routes of administration & side effects of 5-FU .  
Add note on capecitabine. 10
- 3). Write about mechanism of action, side effects, indication of methotrexate. 10
- 4). Anti Her-2 neu therapy in Breast cancer. 10
- 5). Write a note on Carmustine, Lomustine, Temozolamide . 10
- 6). Write about indications, administration, side effects of Doxorubicin. Add a  
Note on cardiotoxicity of anthracyclines. 10
- 7). Rationale of combining chemotherapy with Radiotherapy in Head & Neck  
Cancer. 10
- 8). Risk factors of Ca. Ovary. How do you manage a patient of Ca. ovary with  
Ascites. 10
- 9). Principles of treatment in a case of stage-IV Rectosigmoid carcinoma. 10
- 10). Principles of Androgen deprivation therapy in carcinoma prostate. 10

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUPATI  
UNIVERSITY EXAMINATIONS  
M.D. - RADIOTHERAPY**

**Paper 4: Recent advances in Radiotherapy and oncology**

**Date: 22.4.2021      Time; 3 Hours      Code; 47304      Maximum Marks: 100**

**Instructions to the doctors: Answer all questions.**

**Draw neat and labeled diagrams where necessary**

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1).3D CRT	10
2).Image guided radiotherapy.	10
3). Indications (along with doses of RT) of SRS in clinical practice.	10
4).Intra operative radiotherapy.	10
5).Proton beam therapy.	10
6).Differences between LDR & HDR Brachytherapy. Clinical advantages of HDR over LDR.	10
7).Hyperthermia .	10
8).Write briefly about	10
a) Kaplan Meir curve	
b) Forrest plot	
9).Total body irradiation, indication & technique.	10
10). Write a brief note on	10
a) Radiosensitizers	
b) Radioprotectors	

## VII. BOOKS AND JOURNALS RECOMMENDED

### BOOKS

1. Liebelm and Philips text book of radiation oncology 3rd Edition (2010) Richard THoppe MD, FACR, FASTRO, Theodore Locke Philips MD, FACR, FASTRO, MackRoach III MD, FACR.
2. Perez and Brady's Principles and Practice of Radiation Oncology 5th Edition (2004)Edward C Halperin MD, MA, FACR, Carlos A Perez MD, Luther W Brady .
3. Cancer - Principles and Practice of Oncology 8th Edition, Vincent T De Vita, Jr. Theodore S, Lawrence, Steven A Rosenbergo, Stevven A.
4. Clinical Radiation Oncology (2007) Leonard L Gunderson, Joel E Tepper.
5. Bethesda Handbook of Clinical Oncology (2009) by Carmen J Allegra MD (Editor),Jame Abraham MD (Editor), James L Gulley MD (Editor).
6. Handbook of evidence based radiation Oncology 2nd Edition (2010) Dr. Eric KHansen, Dr, Mack Roach III.
7. Moss's Radiation Oncology: Rational, Technique, Results (1994) William ThomasMoss, and James Daniel Cox.
8. Text Book of Radiotherapy, Gilbert H Fletcher.
9. Treatment planning in Radiation Oncology 2nd Edition (2007) Faiz M Khan.
10. Oxford Handbook of Oncology, Jim Cassidy, Donald Bissett, Roy A J Spence Obe.
11. The Physics of Radiation Therapy: Mechanisms, Diagnosis and Management 3rdEdition by Faiz M Khan.
12. The Physics of Radiology 4th Edition (1983) HaoldElford Johns, John RobertCunningham.
13. Radiobiology for the Radiologist 6th Edition, Eric J Hall.
14. The Chemotherapy source Book 4th Edition, Michel C Perry.
15. Text Book of Medical Oncology 4th edition, Franco Cavalli, Stan B Kaye, Heine HHansen, James O Armitage, Martine J.
16. Surgical Oncology: Contemporary principls and Practice, K. I. Bland, John M Daly,Constantine P Karakousis.

### JOURNALS

1. International Journal of Radiation Oncology, Biology, Physics.
2. Annals of Oncology
3. British Journal for Cancer12
4. CA-A Cancer Journal for clinicians
5. Cancer
6. Cancer of clinical Oncology
7. Journal of Clinical Oncology
8. Journal of Cancer Research and therapeutics
9. Medscape Oncology
10. Seminars in Oncology
11. Seminars in Radiation Oncology
12. The Lancet
13. The new England Journal of Medicine

## VIII. Postgraduate Students Appraisal Form

### Pre / Para /Clinical Disciplines

\*\*\*

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM..... TO.....

Sl. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2.	Patient based / Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis/ Research work										
7.	Log Book Maintenance										

Publications

Yes/No

Remarks\*

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\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGN.OF ASSESSEE

SIGN.OF FACULTY I/C

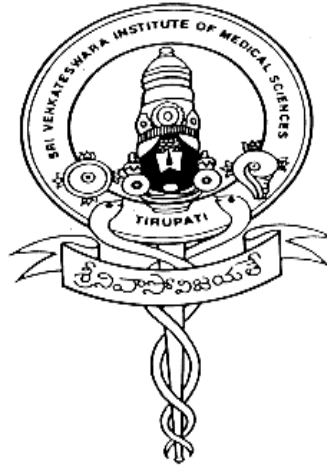
SIGN.OF HOD

Appendix - 1

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,

(A University established by an Act of Andhra Pradesh Legislature)

TIRUPATI - 517 507



LOG BOOK

COMMON FOR MD/ DM/ M.Ch. POSTGRADUATES  
(Suitably modified for each specialty)

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :  
(Preferably be done by the faculty with whom the resident worked for mostpart of the period)

Quality being Assessed

1. Patient Evaluation
2. Academic Knowledge About Patients Problems
3. Curiosity about unexplained Observations
4. Patient Care
5. Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

Signature of the candidate

Signature of the guide

Signature of the HoD with seal



**DETAILS OF POSTINGS OVER 3 YEARS**

**1st YEAR**                      From..... To.....

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

Signature of Faculty :

**2nd YEAR**                      From..... To.....

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

3rd YEAR From ..... To.....

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

Signature of Faculty :

Thesis Topic:

Guide:

Co-Guides :

## SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

## JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Journal Review Presentations

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material , Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyse the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:  
 Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**CASES PRESENTED IN MORTALITY CONFERENCE (optional)**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED (optional)**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LAB PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>

**CONFERENCES ATTENDED**

<b>S. No.</b>	<b>Name</b>	<b>Role</b>	<b>Signature of supervising Faculty</b>

**PUBLICATIONS**

<b>S. No.</b>	<b>Topic</b>	<b>Journal</b>	<b>Role</b>

**BEDSIDE CASE DISCUSSION (optional)**

<b>S. No.</b>	<b>Date</b>	<b>Diagnosis</b>	<b>Signature of Faculty Presented to</b>

SUMMARY OF LOG BOOK

(To be filled at the end of the course & retained in this book)

Name of the student : Admn.No.

Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_

Name of the Institute:

- 1) No. of Journal Review Presentations : Presented ..... Attended .....
- 2) No. of Seminar Presentations : Presented ..... Attended .....
- 3) No. of Clinical Presentations : Presented ..... Attended .....
- 4) No. of Case Presentations : Presented ..... Attended .....
- 5) No. of UG Teaching Programms : Conducted ..... Attended .....  
(Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
- 6) No. of PG Teaching Programmes : Attended
- 7) No. of Investigative Procedures : Performed .....Assisted.....Observed...
- 8) No. of Major Operations / : Performed .....Assisted.....Observed...  
Procedures /  
Experiments
- 9) No. of Minor Operations / : Performed .....Assisted.....Observed...  
Procedures /  
Experiments
- 10) No. of Emergencies : Performed .....Assisted.....Observed...
- 11) No. of Medicolegal work : Performed .....Assisted.....Observed...
- 12) No. of Public Health Visit /  
Social work /  
Survey /  
Immunization /  
Camps
- 13) No. of Clinico Pathological Conference: Presented ..... Attended .....
- 14) No.of special investigation / : Conducted ..... Attended .....  
Procedure
- 15) No. of events attended Conferences..... Symposia .....  
Workshops ..... CME .....
- 16) Any other activities :

Signature of the candidate      Signature of the guide      Signature of the HoD with seal

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUPATI**

(A University established by an Act of A.P. State Legislature)

**GUIDELINES FOR 'PLAGIARISM' CHECK**

**WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D students**

**Ref.:Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/MS/DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for Theses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They are requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

**Sd/- CONTROLLER OF EXAMINATIONS**

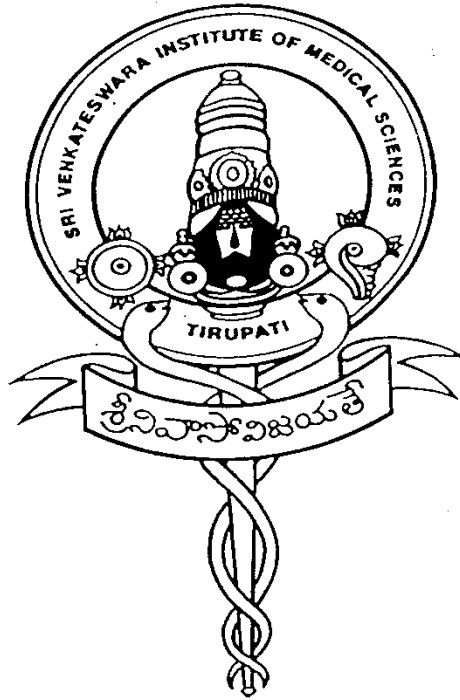
To: The HOD/Chief Guide Concerned for information and circulation among the respective students.



**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI - 517 507**



**M.D. - BIOCHEMISTRY**

**COMMON BOARD OF STUDIES MEETING**

**ON 22.07.2021**

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**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUAPATI**

**M.D. (BIOCHEMISTRY)**

**COMMON BOARD OF STUDIES MEETING ON 22.07.2021**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**  
**M.D (BIOCHEMISTRY)**

**COMMON BOARD OF STUDIES MEETING ON 22.07.2021**

**List of Members:**

1. Dr B. Siddhartha Kumar - Chairman  
Dean, SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar, SVIMS,  
Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr Aparna R Bitla - Internal expert  
Professor & Head  
Dept. of Biochemistry  
SVIMS, Tirupati.
5. Dr M.M. Suchitra - Internal expert  
Professor  
Department of Biochemistry  
SVIMS, Tirupati
6. Dr M. Vijaya Bhaskar - External expert  
Professor  
Nizam's Institute of Medical Sciences,  
Hyderabad, Telangana

# **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING FOR MD IN BIOCHEMISTRY**

## **I. PREAMBLE**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The student who has obtained MD degree in Biochemistry should be well-versed in basic concepts and recent advances in the subject and should have acquired skills and expertise in various laboratory techniques applicable to metabolic and molecular aspects of medicine and in research methodology. Training during the course should equip the student with skills to become an effective teacher, able to plan and implement teaching programmes for students in medical and allied health science courses, set up/manage a diagnostic laboratory, generate, evaluate and interpret diagnostic laboratory data, interact with clinicians to contribute to more effective patient care and carry out a research project and publish its results.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment.

## **II. SPECIFIC LEARNING OBJECTIVES**

At the end of the MD training programme in Biochemistry, the post graduate student should have acquired competencies in the following areas, as detailed below.

### **1. Acquisition of knowledge**

The student should be able to explain clearly concepts and principles of biochemistry and cell biology, including correlations of these with cellular and molecular processes involved in health and disease.

### **2. Teaching and training**

The student should be able to effectively teach undergraduate students in medicine and allied health science courses so they become competent health care professionals and able to contribute to training of post graduate students.

### **3. Diagnostic services**

The student should be able to set up/supervise/manage a diagnostic

laboratory in Biochemistry in a hospital, ensuring quality control, and providing a reliable support service. The student should be able to provide clinicians with consultation services for diagnostic tests in biochemistry and in interpretation of laboratory results.

#### **4. Research**

The student should be able to carry out a research project from planning to publication and be able to pursue academic interests and continue life-long learning to become more experienced in all the above areas and to eventually be able to guide postgraduates in their thesis work.

Regulations governing the Doctor of Medicine (Biochemistry) programme

##### **1. Title of the programme**

The programme shall be called : Doctor of Medicine (Biochemistry)

##### **2. Eligibility for admission**

A candidate seeking admission into this course shall have MCI recognized M.B.B.S. qualification.

##### **3. Duration of the programme**

The programme shall extend for a period of three academic years.

##### **4. Syllabus**

The Board of studies shall prepare and approve syllabus. Also it shall review the same periodically.

##### **5. Admission**

Based on an entrance examination to be conducted at the national level – NEET-PG. All the students should get their MBBS degree registered with AP state medical council before completion of first semester.

##### **6. Attendance – Eligibility for appearing for final university exams.**

All the 365 days of the year are working days for Residents. The Resident should have a minimum percentage of attendance i.e. 80% in every academic term of 6 months duration each for the candidate to be eligible for the University examinations.

### III. SUBJECT SPECIFIC COMPETENCIES

The student during the training programme should acquire the following competencies:

#### A. Cognitive domain

1. Describe and apply biochemical principles to explain the normal state, abnormal disease conditions and mechanism of action used in the perception, diagnosis and treatment of diseases. Explain energy transactions in a living system, and describe importance of bio molecules in sustaining the life process.
2. Describe pathways of the intermediary metabolism along with their individual and integrated regulation and apply that in understanding the functioning of the body.
3. Describe and apply the concept of nutrition in health and disease, micro- and macro- nutrition and essential nutrients, and interlinks of nutrients with metabolism and functions of a living system.
4. Apply and integrate knowledge of molecular and metabolic conditions in normal and disease states for clinical problem solving and research.
5. Acquire knowledge on application of various aspects of genetic engineering in medicine.
6. Acquire knowledge and apply the principle of statistics, biostatistics and epidemiology to the evaluation and interpretation of molecular and metabolic disease states.
7. Evaluate, analyze and monitor disease states by applying relevant biochemical investigations and interpreting the clinical and laboratory data.
8. Able to integrate principles of immunology in biochemistry.
9. Demonstrate knowledge of basics of research methodology, develop a research protocol, analyse data using currently available statistical software, interpret results and disseminate these results and to have the potential ability to pursue further specializations and eventually be competent to guide students.
10. Describe the principles of teaching - learning technology towards application and take interactive classroom lectures, prepare modules for PBL, organize and conduct PBLs, case discussions, small group discussions, Seminars, Journal club and research presentations.
11. Demonstrate knowledge of principles of Instrumentation.
12. Demonstrate knowledge about recent advances and trends in research in the field of clinical biochemistry.

## **B. Affective domain**

1. Effectively explain to patients from a variety of backgrounds, the molecular and metabolic basis of disease states and lifestyle modifications.
2. Communicate biochemical reasoning effectively with peers, staff and faculty, and other members of the health care team.
3. Demonstrate empathy and respect towards patients regardless of the biochemical nature of their disease.
4. Demonstrate respect in interactions with patients, families, peers, and other health care professionals.
5. Demonstrate ethical behavior and integrity in one's work.
6. Demonstrate effective use of nutrition, lifestyle and genetic counseling.
7. Be aware of the cost of diagnostic tests and economic status of patients.
8. Acquire skills for self-directed learning to keep up with developments in the field and to continuously build to improve on skills and expertise.

## **C. Psychomotor domain**

1. Able to select, justify, and interpret the results of clinical tests in biochemistry.
2. Develop differential diagnoses for molecular and metabolic causes of diseases.
3. Suggest preventive, curative, and/or palliative strategies for the management of disease.
4. Predict effectiveness and adverse effects associated with disease intervention.
5. Demonstrate skills for clinical diagnosis, testing, understanding of biochemical conditions and diagnostic service.
6. Perform important biochemical, immunological and molecular biology techniques.
7. Observed working of important advanced techniques.
8. Demonstrate standard operating procedures of various methods and techniques used in clinical biochemistry.
9. Determination of enzyme activity and study of enzyme kinetics. Ideally it should be accompanied by purification (partial) of the enzyme from a crude homogenate to emphasize the concepts of specific activity, yield and fold purification.
10. Demonstrate and report routine investigations in hematology and microbiology.
11. Demonstrate presentation skills at academic meetings and publications.

## **IV. SYLLABUS**

### **THEORY**

## **PAPER I**

**Physical and organic aspects of biochemistry, General laboratory procedures, Biomolecules, cell biology, biochemical techniques, biostatistics and research methodology, basics of medical education in teaching and assessment of biochemistry.**

### **PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY**

pH and buffers, gas laws and partial pressures colloids and emulsions, surface tension, viscosity, diffusion, osmosis, solutions, reactions of aldehydes, ketones, alcohols and organic acids, Vanderwaals forces, hydrogen bonding, hydrophobic interactions and ionic bridges, determination of molecular weights.

### **GENERAL LABORATORY PROCEDURES**

Water, reference materials, glass ware and plastic ware, volumetric equipment centrifuges, solutions, mixers and homogenizers, filtration and concentration, balances, units, buffers, safety.

### **BIOMOLECULES**

Properties of water

Concept of an acid, a base, pH, pK, buffer and buffering capacity Classification, structure and functions of amino acids and peptides Structural organization of proteins and relationship with their functions:

- Primary, secondary, tertiary and quaternary structure of proteins
- Protein folding and denaturation, structure-function relationship of proteins
- Structure and functions of hemoglobin and myoglobin
- Structure and function of collagen
- Structure and function of immunoglobulins, classification, functions, properties and reactions of carbohydrates classification, properties and importance of lipids
- Fatty acids - nomenclature, classification, properties, reactions
- Mono, di and triacylglycerols
- Transfats
- Cholesterol - structure, properties and functions
- Phospholipids - definition, types, properties and importance
- Glycolipids - definition, types, functions, examples.
- Lipoproteins - definition, structure, types, functions, role of apoproteins, importance in health and disease.
- Biological membranes - structure, function, properties and importance.
- Micelles and liposomes nucleotides and nucleicacids
- Purine and pyrimidine bases in DNA and RNA



- Nucleosides and nucleotides
- Physiologically important nucleotides
- Synthetic analogues of purine/ pyrimidine bases and nucleosides used as therapeutic agents (anti-cancer drugs, anti-viral drugs)
- Watson and crick model of DNA structure
- Structure and functions of different types of RNA.

## **CELL BIOLOGY**

- Structure of the cell, different sub cellular organelles and cell fractionation
- Structure and functions of cell membrane, solute transport across biological membranes
- Intracellular traffic and sorting of proteins
- Intracellular signaling pathways, membrane receptors and second messengers  
Extracellular matrix: composition, importance and biomedical importance, cellular adhesion molecules and intercellular communication
- Cytoskeleton, muscle contraction and cell motility
- Red and white blood cells

## **ANALYTICAL TECHNIQUES IN BIOCHEMISTRY**

Principles clinical applications and related aspects of:

- Spectro photometry (UV and visible spectro photometry),
- Atomic absorption spectro photometry
- Flame photometry
- Fluoro metry
- Turbidimetry and nephelometry
- Gravimetry
- Osmometry
- Electrochemistry (pH electrodes, ion-selective electrodes, gas-sensing electrodes)
- Chemiluminescence
- Water testing
- Electrophoresis (principle, types, applications; isoelectric focusing capillary electrophoresis; 2-Delectrophoresis, clinical applications and related aspects)
- Chromatography (principle, types [including high performance liquid chromatography and gaschromatography] clinical applications and related aspects)
- Immunoassays (principle, methods, types, clinical applications and related aspects)
- Techniques in molecular biology: Blotting techniques, polymerase chain reaction

(PCR), DNA and protein sequencing, microarrays and DNA chip technology, cloning techniques, genomics, proteomics and metabolomics

### **Nanotechnology and micro-fabrication**

**Techniques to study in vivo metabolism - NMR, SPECT, PET scans**

**Radioisotope-based techniques and its applications**

## **BIostatISTICS AND RESEARCH METHODOLOGY**

- Basic concepts of biostatistics as applied to health science
- Measures of central tendencies and variation
- Statistical tests: parametric and non-parametric comparisons, t-test, paired t-test, analysis of variance, chi-square test, Fischer's exact test, non-parametric tests, correlation and regression (linear and non-linear regression)
- Multivariate analysis methods, one way and two way analysis of variance, multiple range tests
- Statistical methods of validation of diagnostic tests - commonly used statistical software
- Calculation of sample size
- Basics of epidemiological study designs and sampling methodologies
- Meta-analysis and systematic reviews

## **V. BASICS OF MEDICAL EDUCATION IN TEACHING AND ASSESSMENT OF BIOCHEMISTRY**

Principles of adult learning, taxonomy of learning, educational objectives, principles of assessment and question paper setting, methods of assessing knowledge, appropriate use of media, microteaching, small group teaching.

### **Paper II**

**Enzymes, bioenergetics, biological oxidation, intermediary metabolism and regulation, inborn errors of metabolism and nutrition**

#### **Enzymes:**

Properties, classification, mechanism of action, coenzymes and cofactors, kinetics of enzyme activity, regulation of enzyme activity, enzyme inhibition, isoenzymes, diagnostic and therapeutic enzymes, principles of assays of enzymes, enzymes as

therapeutic targets of drugs.

### **Biological oxidation:**

Basic concepts of thermodynamics and its laws, as applied to living systems, Exergonic and endergonic reactions and coupled reactions, redox potential, High energy compounds

Classification and role of oxidoreductases, Cytochromes; cytochrome P450 system

### **Respiratory chain and oxidative phosphorylation**

- Components, complexes and functioning of the respiratory chain
- Process of oxidative phosphorylation
- Mechanisms of ATP synthesis and regulation
- Mitochondrial transport systems and shuttles
- Inhibitors, uncouplers and ionophores
- OXPHOS diseases

## **OVERVIEW OF METABOLISM AND INTERMEDIARY METABOLISM**

### **Metabolism of carbohydrates**

- Digestion and absorption
  - Glycolysis and tricarboxylic acid cycle (TCA), including regulation
  - Glycogen metabolism and its regulation
  - Cori cycle, gluconeogenesis and control of blood glucose
  - Metabolism of fructose and galactose
  - Pentose phosphate (HMP shunt) and uronic acid pathways and their significance
  - Polyol pathway
  - Regulation of blood glucose levels
  - Diabetes mellitus (including gestational diabetes mellitus) – classification, pathogenesis, metabolic abnormalities, diagnostic criteria, principles of treatment, pathogenesis of complications, laboratory tests
- 
- Metabolism of ethanol
  - Inborn errors of metabolism

### **Metabolism of lipids**

- Ketone bodies – formation, utilization and regulation
- Metabolism of unsaturated fatty acids and eicosanoids
- Metabolism of triacylglycerol; storage and mobilization of fats
- Metabolism of cholesterol
- Metabolism of lipoproteins
- Metabolism in adipose tissue
- Role of liver in lipid metabolism, fatty liver, lipotropic factors
- Role of lipids in atherogenesis
- Metabolism of phospholipids and associated disorders
- Inborn errors of metabolism

### **Metabolism of amino acids and proteins**

- Digestion and absorption
- Pathways of amino acid degradation - transamination, deamination
- Transport and metabolism of ammonia
- Metabolism of individual amino acids.
- Plasma proteins
- Inborn errors of metabolism

### **Metabolic inter-relationships**

- Fate of pyruvate, fate of acetyl co A
- One carbon metabolism

### **Metabolism of nucleotides**

- De novo synthesis of purine nucleotides
- Salvage pathway for purines
- Degradation of purines
- De novo synthesis of pyrimidin nucleotides
- Degradation of pyrimidine
- Synthetic analogues of purine/pyrimidine bases and nucleosides used as therapeutic agents
- Inborn errors of metabolism

### **Metabolism of heme**

- Biosynthesis of heme and associated disorders
- Degradation of heme and associated disorders

### **Metabolism in individual tissues and in the fed and fasting states**

- Liver, adipose tissue, brain, RBCs

### **Nutrition**

- Principal food components
- General nutritional requirements
- Basal metabolic rate, Energy requirements
- Biological value of proteins
- Thermogenic effect of food - specific dynamic action
- Balanced diet, diet formulations in health and disease, mixed diet
- Nutritional supplements
- Food toxins and additives
- Parenteral nutrition
- Disorders of nutrition, obesity, protein and protein energy malnutrition, dietary fibers, under-nutrition, laboratory diagnosis of nutritional disorders
- National Nutrition Programme

### **Vitamins**

Classification, biochemical role, sources, RDA and deficiency state of each vitamin (including diagnostic tests for deficiency and treatment), hypervitaminosis

### **Minerals**

Classification, biochemical role, sources, requirement and deficiency state of each mineral (including diagnostic tests for deficiency and treatment)

### **Metabolism of xenobiotics**

Free radicals and anti-oxidant defence systems in the body and associations with disease processes

### **Paper III**

## **Molecular biology, molecular and genetic aspects of cancer, immunology and effects of environmental pollutants on the body**

### ***Structure and organization of chromosomes and chromatin re-modelling DNA replication***

- DNA replication in prokaryotes and eukaryotes (including important differences between the two):
- Roles of DNA polymerase, helicase, primase, topoisomerase and DNA ligase
- Replication fork
- Okazaki fragments and its importance in replication.
- Overview of role of major DNA repair mechanisms – mismatch repair, base excision repair, nucleotide excision repair and double strand break repair.
- Diseases associated with abnormalities of DNA repair systems
- DNA recombination

### **Transcription**

- Structure of a gene - exons and introns, promoter, enhancers/ repressors and response elements.
- Process of transcription in prokaryotes and eukaryotes – initiation, elongation and termination (including important differences).
- Post-transcriptional processing – capping, tailing and splicing.

### **Genetic code and mutations**

- Characteristics of the genetic code
- Molecular basis of degeneracy of the genetic code (Wobble hypothesis)
- Mutagens- examples of physical, chemical and biological mutagens.
- Types of mutations – point mutations and chromosomal mutations
- Relationship of mutations with specific diseases

### **Translation**

- Basic structure of prokaryotic and eukaryotic ribosomes.
- Structure of tRNA (diagram of clover leaf model of tRNA structure) and its function in protein synthesis.
- Function of aminoacyl tRNA synthase.
- Process of protein synthesis (translation) – initiation, elongation and termination (including important differences between prokaryotic and

eukaryotic translation).

- Inhibition of prokaryotic translation by antibiotics.
- Post-translational modifications

### **Regulation of gene expression in prokaryotes and eukaryotes**

- The operon concept in prokaryotes
- Role of general and gene specific transcription factors
- Small interference RNA (siRNA) and micro RNA (miRNA).
- Other modes of regulation of gene expression: alternative splicing, alternative promoter usage, DNA methylation, Histone acetylation / deacetylation, RNA editing, alterations of RNA stability

### **Recombinant DNA technology and its applications in modern medicine**

- Concepts of recombinant DNA, genetic engineering, biotechnology and cloning.
- Restriction endo nucleases.
- Vectors for cloning – plasmids and phages.
- Genomic and cDNA libraries.
- Applications of recombinant DNA technology in medicine.
- Gene therapy
- Diagnosis of genetic diseases and genetic counseling
- DNA fingerprinting
- DNA sequencing
- Microarrays
- Fluorescent in situ hybridization (FISH)
- DNA vaccines
- Transgenic animals
- Application of molecular techniques in forensic investigation and medico-legal cases

### **Overview of Human Genome Project**

## **Basics of bioinformatics**

### **Principles of human genetics**

- Alleles, genotypes and phenotypes
- Patterns of inheritance: monogenic and polygenic inheritance
- Population genetics
- Genetic factors in causation of diseases
- Types of genetic diseases: Chromosomal, monogenic and polygenic disorders, mitochondrial disorders, nucleotide repeat expansion disorders, imprinting disorders
- Screening for genetic diseases and prenatal testing
- Ethical and legal issues related to medical genetics

### **Stem cells in clinical medicine**

- Basic concepts regarding stem cells
- Types of stem cells: embryonic and induced pluripotent stem cells (iPSC)
- Potential applications in the clinical medicine
- Ethical and legal issues related to use of stem cells in medicine

### **Cancer**

- Cell cycle and its regulation, mitosis, meiosis
- Mechanisms of cell death, Apoptosis
- Carcinogens: physical, chemical and biological
- Clonal origin of cancers
- Genetic basis of carcinogenesis
- Role of oncogenes and tumour suppressor genes
- Familial cancer syndromes
- Cancer stem cells
  
- Epigenetic regulation in cancer
- Gene expression profiling in cancer
- Cancer cell biology: cell cycle abnormalities, telomerase activity, proliferative capacity and decreased apoptosis
- Metastasis
- Tumor markers
- Biochemical basis of cancer chemotherapy and drug resistance
- New methods of anti-cancer therapy: targeted cancer therapy, cancer immunotherapy.



## **Immunology**

- Innate and acquired immunity
- Humoral and cell-mediated immunity
- Cells and organs of the immune system - T and B cells, macrophages, dendritic cells, NK cells, granulocytes
- Antigens, epitopes and haptens
- Immunoglobulin classes, isotypes, allotypes, idiotypes, monoclonal antibodies, organization and expression of immunoglobulin genes, immunoglobulin gene rearrangement, class switching
- Antigen-antibody interaction - immunochemical techniques
- Major histocompatibility complex, antigen processing and presentation,
- T cell and B cell receptor, toll like receptors
- T cell maturation/activation/differentiation
- B cell generation/activation/differentiation
- Cytokines
- Complement system, cell
- Immune response to infections
- Hypersensitivity reactions
- Immunologic tolerance, Immunosuppression and immunopotential
- Vaccines
- Immuno-deficiency syndromes
- Autoimmunity
- Transplantation immunology
- Cancer and immune system,
- Immunodiagnostics
- Immunotherapy

*Environmental Biochemistry: Toxic elements and effects of environmental pollutants on the body, health and population*

## Paper IV

**Basic principles and practice of clinical biochemistry, Laboratory management along with Total quality management and analytical techniques, Clinical correlates and analytical procedures including molecular diagnostics related to different body systems/organs, endocrinology, and recent advances in biochemistry**

### Paper IV

**Clinical biochemistry and molecular diagnostics related to different body systems/organs, endocrinology, and recent advances in biochemistry**

#### *Basic principles and practice of clinical biochemistry*

- Units of measurement, conventional and SI units, interconversion of units, reference material, testing of water purity, calibration of commonly used laboratory equipment, reagents, clinical laboratory supplies, basic separation techniques, laboratory calculations, specimen collection and processing (Collection of blood, urine and body fluids, handling of specimens, storage and preservatives, anticoagulants), Preanalytical variations (Biological variation, specimen collection related variation, post collection variations) safety in the laboratory, clinical utility of laboratory tests (including sensitivity, specificity, ROC curves, etc), analysis in the laboratory, evidence-based laboratory medicine, establishment and use of reference values, critical alerts. Biomedical waste management, Basics of laboratory accreditation

#### **Laboratory management**

- Method evaluation: analytical goals, precision, accuracy, bias, sensitivity and specificity, selection of method and evaluation
- Total quality management: Fundamental concepts, control of preanalytical, analytical and postanalytical variables, internal and external quality control programs, ; aboraotryinformation system
- Automation: Definition, instrumental concepts, analysers, selection of analysers, trends in automation

#### **Analytical techniques and instrumentation**

- Principles of basic techniques used in a clinical biochemistry laboratory (spectrophotometry, electrochemistry, electrophoresis, osmometry, chromatography, mass spectrometry, immunochemical techniques, molecular techniques, automation, point of care testing.

#### **Clinical correlates and analytical procedures**

- Amino acids, peptides and proteins; non-protein nitrogenous compounds
- Enzymes
- Carbohydrates
- Lipids, lipoproteins and apolipoproteins and other cardiovascular risk factors
- Electrolytes
- Blood gases and pH
- Hormones and associated disorders
- Catecholamines and serotonin
- Vitamins; trace and toxic elements
- Hemoglobin, and bilirubin
- Porphyrins and associated disorders
- Bone and mineral metabolism
- Tumour markers
- Assessment of organ functions (hypothalamus and pituitary, adrenal glands, gonads, thyroid, parathyroid, liver, kidney, heart, stomach, pancreas, intestine, etc) and associated disorders
- Pregnancy and maternal and fetal health
- Reproduction related disorders -infertility
- Newborn screening
- Inborn errors of metabolism
- Hemostasis
- Therapeutic drug monitoring
- Clinical toxicology
- Molecular diagnostics
- Body fluid analyses

**Regulation of fluid and electrolyte balance and associated disorders**

**Regulation of acid-base balance and associated disorders**

## **Biochemistry of the endocrine system**

- Cell signalling: Introduction of concept of Autocrine, paracrine, juxtacrine, endocrine systems
- Classification and general mechanism of action of hormones
- Chemistry, Biosynthesis, secretion, regulation, transport and mode of action of hypothalamic peptides, adenohipophyseal and neurohipophyseal hormones, thyroid and parathyroid hormones, calcitonin, pancreatic hormones, adrenocortical and medullary hormones, gonadal hormones, gastrointestinal hormones, opioid peptides, parahormones.
- Biochemistry of conception, reproduction and contraception
- Endocrine interrelationship and their involvement in metabolic regulation
- Neuro-modulators and their mechanism of action and physiological significance
- Biochemical aspects of diagnosis and treatment of endocrinal disorders.
- Autoimmune polyglandular syndromes
- Other biomolecules: Autocrine, paracrine molecules like nitric oxide, endothelins.

## **Hematopoietic disorders**

- Iron deficiency and other hypoproliferative anaemias- iron metabolism, laboratory tests of iron status, iron therapy
- Anaemia of chronic disease, anaemia of renal disease
- Hemoglobinopathies - sickle cell anaemia, methaemoglobinemias, thalassemia syndromes, Megaloblastic anaemia
- RBC membrane and metabolism
- Hemolytic anaemia - inherited defects in RBC membrane and enzymes (G6PD deficiency), immunologic causes of hemolysis
- ABO blood group system - biochemical basis, transfusion biology.
- Plasma cell disorders - multiple myeloma.

## **Hemostasis and thrombosis**

- Biochemical mechanisms, related laboratory tests, antiplatelet/ anticoagulant/fibrinolytic therapy

## **Biochemistry of AIDS**

### **Nervous system**

- CSF and its composition
- Neurotransmitters and their receptors
- Ion channels and channelopathies
- Neuro trophic factors
- Protein aggregation and neuro degeneration
- Alzheimer's disease, Parkinson's disease, Huntington's disease, multiple sclerosis
- Prions and prion diseases
- Guillain-Barre syndrome -immune pathogenesis
- Myasthenia gravis -patho physiology
- Hereditary myopathies - Duchenne muscular dystrophy
- Inherited disorders of muscle energy metabolism
- Mitochondria myopathies
- Pathophysiology of psychiatric disorders such as anxiety, depression and schizophrenia

### **Cardiovascular system**

- Atherosclerosis - pathogenesis, risk factors, prevention and treatment Cardiac failure, acute coronary syndrome, cardiac biomarkers

### **Respiratory system**

- Gaseous exchange in lungs - physiological features and disturbances, arterial blood gases, Pathogenesis of cystic emphysema, alpha-1 anti-trypsin deficiency

### **Gastrointestinal system**

- Gastric physiology
- Pathophysiology of peptic ulcer disease, including role of *H. pylori*; gastric function tests; Zollinger-Ellison syndrome
- Digestion and absorption of nutrients and the associated disorders; evaluation of malabsorption (steatorrhea, lactose intolerance)
- Celiac disease
- Inflammatory bowel disease

- Protein losing enteropathy
- Regulatory peptides in the gut
- Neuro endocrine tumours

### **Kidney**

Kidney function tests; pathophysiology, biochemistry, laboratory findings and management in acute kidney injury and chronic kidney disease; estimation of GFR; glomerular diseases - pathogenesis and mechanisms of glomerular injury, nephritic syndrome, diabetic nephropathy; tubular disorders - renal tubular acidosis, proteinuria, nephrolithiasis, kidney transplant; biochemical aspects of renalstones.

### **Liver**

- Liver function tests
- Hyper bilirubinemias
- Viral hepatitis
- Serologic/virologic markers
- Alcoholic liver disease, fatty liver, chronic liver disease, cirrhosis and its complications
- Pathogenesis of ascites
- Hepatic encephalopathy
- Metabolic diseases affecting liver
- Reye's syndrome
- Diseases of gall bladder/bile ducts - pathogenesis of gall stones
- Pancreas - acute and chronic pancreatitis, cystic fibrosis, pancreatic function tests.

### **Bone and mineral metabolism**

- Bone structure and metabolism; metabolism of calcium, phosphate and magnesium; regulation and abnormalities of bone metabolism; vitamin D; parathyroid hormone; calcitonin; parathyroid hormone-related (PTHrP); osteoporosis - pathophysiology; markers of bone turnover

## PRACTICAL

**By the end of the course, the post graduate student should have acquired practical skills in the following:**

- Use of common laboratory equipments like centrifuge, balance, colorimeter, pH meter
- Preparation of reagents
- Performance of reactions of carbohydrates, amino acids and proteins, and lipids
- Experiments to demonstrate constituents of milk
- Experiments to demonstrate normal and abnormal constituent so furine
- Determination of iodine number and saponification number of fats
- Estimation of ammonia and amino acids by Sorenson formal titration
- Estimation of nitrogen estimation in a given amino acid solution by micro Kjeldahl method
- Estimation of phosphorus by Fiske Subbarao method
- Estimation of ascorbic acid in lime
- Estimation of calcium content in milk
- Estimation of proteins by Folin's method and dye binding method.
- Two-dimensional paper chromatography for separation of amino acids
- Preparation and estimation of starch, glycogen, cholesterol, casein (phosphorus in casein) and hemoglobin from biological samples  
Determination of enzyme activity and study of enzyme kinetics, using any 2 suitable enzymes (eg, catalase from rat liver and acid phosphatase from potatoes).
- Estimation of clinical analytes as detailed below:
  - Blood glucose, glycated haemoglobin; performance of glucose tolerance test
  - Electrolytes, arterial blood gas analysis
  - Cholesterol, triglycerides, free fatty acids, phospholipids, Lp (a), urea, creatinine, uric acid, ammonia, micro albuminuria
  - Parameters of liver function tests (bilirubin, hepato-biliary enzymes such as AST, ALT, ALP, GGT, serum proteins/albumin and prothrombin time)
  - Calcium, magnesium, copper (and ceruloplasmin), serum iron, TIBC and ferritin
  - Markers of myocardial damage (CK, CK MB, troponins, LDH)
  - Other enzymes of diagnostic relevance (eg. phosphatases, amylase etc)
  - Vitamins D and B12 and folate

- Routine urine analysis, creatinine clearance, eGFR calculation, analysis of renal calculi, other screening tests
- Electrophoresis of serum proteins
- Electrophoresis of lipoprotein (*Optional*)
- Electrophoretic separation of LDH isozymes or any other isoenzymes
- Clearance tests
- CSF analysis
- Tumor marker analysis, Thyroid function tests and other hormone assays by ELISA/RIA/Chemiluminescence Analysis of electrolytes, blood gases
- Preparation of buffers.

### **Clinical Laboratory**

- Laboratory work up of patients/subjects: for routine clinical chemistry investigations, specific assays, screening tests
- Taking any one parameter, students should prepare a Levy Jennings chart and plot inter-assay and intra-assay variation for the laboratory.
- Implementation of West gard rules.
- Computers and statistical analysis: Calculation of mean, median, mode, standard deviation, correlation, linear and nonlinear regression, tests of significance, nonparametric tests, Basics of computers, use of micro soft excel spreadsheets solutions, SPSS, EPI-Info, Information retrieval, use of internet

### **Optional:**

- Determination of reference values for any one parameter for the clinical laboratory
- In addition, all efforts should be made to ensure that students at least see a demonstration of the following techniques.
- Separation of peripheral blood lymphocytes using ficollhpaque
- Sub cellular fractionation/marker enzymes for organelles to demonstrate fractionation
- Ultracentrifugation
- Isolation of high molecular weight DNA from tissues/blood
- Isolation of RNA; synthesis of cDNA by reverse transcription; PCR (both conventional and real-time)
- Isolation of plasmids and agarose gel electrophoresis for proteins and



- nucleic acids
- Basic techniques in cell culture
- High performance liquid chromatography(HPLC)

### Practical and skills training

	MONTHS	LAB	Objective	Teaching/Learning method	Assessment	
	<b>1<sup>st</sup>YEAR</b>					
1	MAY	CLINICAL LAB	Understand workflow in clinical laboratory	Practical training during posting	Theory examination Group discussion Viva-voce Spotters Case discussion	
			Know the reference ranges of analytes including sensitivity and linearity of methods used	Resource material		
2	JUNE	CLINICAL LAB	Types of sample, sample collection precautions and anticoagulants and preservatives used in sample collection	Assignment		
			Should know about pre-analytical, analytical and post analytical variables	Resource material		
			Should validate and report results under supervision	Practical training during posting Simulation exercises		
			Know the types of water used in the clinical laboratory	Resource material		
			Cleaning and maintenance of glassware and plastic ware used in the laboratory	Relevant case discussions, Resource material		
			Use of computers and LIS	Resource material Assignment Simulation exercises		
						Theory examination OSPE

3	JULY	Research LAB	Learn basics of Research methodology and Biostatistics Should be able to perform using Microsoft excel spreadsheets data entry and graphical presentation of data Commonly used Biostatistical tools for comparison of means, correlation and prediction Journal club presentation Learn writing research protocols	Resource material Discussions Simulation exercises	Theory examination OSPE
4	AUGUST	UG LAB	Must be able to perform the undergraduate experiments both qualitative and quantitative Participate in MBBS Practical classes	Hands on training Resource material	Practical examination - Same pattern as MBBS (Qualitative)
5	SEPTEMBER	UG LAB	Must be able to prepare reagents and solutions commonly used in the UG practicals Participate in MBBS Practical classes		
6	OCTOBER	UG LAB	Should learn to handle equipment - colorimeter, centrifuge, physical balance, pH meter Participate in MBBS Practical classes	Resource material	Theory examination
7	NOVEMBER	UG LAB	Gain knowledge regarding types of glassware, plastic ware, pipettes and types of water -distilled water preparation Should know about the safe practices in the laboratory and types of accidents which can occur and first aid in case of chemical burns Participate in MBBS Practical classes Train paramedical students	Resource material	
8	DECEMBER	UG LAB			

9	JANUARY	CLINICAL LAB	Learn details of patient preparation, instructions to patient	Seminars Case discussions	OSPE Spotters
10	FEBRUARY	CLINICAL LAB	Learn about interpretation of the pre-analytical, analytical and post-analytical variables,		
11	MARCH	CLINICAL LAB	anti-coagulants,preservatives and interferences in the lab reports		
12	APRIL	CLINICAL LAB	Validate the reports under guidance To be trained in handling, maintenance and operating of auto analyser QC Measures-internal QC- Interpreting control charts advanced clinical laboratory investigations		
<b>II<sup>nd</sup>YEAR</b>					
13	MAY	PG LAB	Gain knowledge regarding types of glassware, plastic ware, pipettes, PG lab equipment and types of water -distilled water preparation Preparation of normal and molar solutions and Buffers Calculations and conversions Must prepare reagents for the experiments to be performed	Resource material Practical	Practical examination (End point assays Kinetic assays Techniques Method evaluation experiments)  OSPE
14	JUNE	PG LAB	Must be able to run standard curves and endpoint estimations and perform kinetic estimations and report the results, Perform precision check, recovery experiments and report the results, Should be able to carry out method evaluation experiments for kinetic and endpoint assays		
15	JULY	PG LAB	Must gain expertise in performing techniques electrophoresis, chromatography, flame photometry and PAGE.		



16	AUGUST	PG LAB	Calibration of pipettes and other instruments, Standardization of methods selected for thesis.	Resource material Practical	OSPE
17	SEPTEMBER	PG LAB	Handling of cooling centrifuge, Separation of cell components, Should be able to perform a PCR technique and DNA isolation Western blotting technique	Resource material	
18	OCTOBER	CLINICAL LAB	Perform advanced clinical laboratory investigations	Resource material	Practical Examination
19	NOVEMBER	CLINICAL LAB	Validate the reports, Present QC results, Program methods in Analyzers	Practical	OSPE
20	DECEMBER	CLINICAL LAB			
21	JANUARY	CLINICAL LAB			
22	FEBRUARY	UG LAB	Student must get acquainted with teaching and conducting undergraduate practicals Maintenance of the equipment and glassware used in UG lab Should learn about corrosive chemicals used and precautions to be taken in handling such chemicals such as storage and discarding the reagents after use.	Resource material Hands on experience	Theory examination Practical examination (Qualitative and Quantitative) Viva-voce
23	MARCH	PERIPHERAL POSTINGS	Posted in allied branches as microbiology, pathology, transfusion medicine and Endocrinology	---	The postgraduate shall work in the allied departments in the morning session and report to the parent department for practical work (UG/PG) in
24	APRIL				

					the afternoon session
	<b>III<sup>rd</sup>YEAR</b>				
25	MAY-June15	RESEARCH LAB	Gain knowledge on Research methodology Journal club presentations, Should be able to perform statistical analysis using appropriate software Should be able to interpret an output and draw conclusions Journal club presentations	Seminars, Lectures	OSPE, Theory examination
26	JUNE16-30th	RURAL POSTINGS	District hospital		
27	JULY	RURAL POSTINGS	District hospital		
28	AUGUST-SEPTEMBER 15	RURAL POSTINGS	District hospital		
29	SEPTEMBER 16 <sup>th</sup> - 30th	CLINICAL LAB	Validate the reports independently, Programming of the analyser methods independently	Case discussions	OSPE Simulation exercises
30	OCTOBER	CLINICAL LAB	To train paramedical students, To manage the clinical lab independently on Sundays	Case discussions	
31	NOVEMBER	CLINICAL LAB	To train the 1st year MD student	Case discussions	
32	DECEMBER	UG LAB	Conducting undergraduate practical independently	-----	Observation
33	JANUARY	UG LAB			
34	FEBRUARY	UG LAB			
35	MARCH	RESEARCH LAB	Should know the working principles of specialized equipment available for research	Resource material Demonstration	Viva-voce
36	APRIL	RESEARCH LAB	Should be able to design a pilot study		

## VI. TEACHING AND LEARNING METHODS

### Teaching methodology

Active and interactive learning should be the mainstay of the program. The following methods are to be used to facilitate learning by and training of MD students.

#### 1. Interactive lectures, tutorials, problem-based learning, case discussions, seminars, guest lectures, E-learning

The above teaching learning methods are employed for the post graduate students to acquire updated knowledge on various aspects of basic and clinical biochemistry, immunology and molecular biology, and their application in modern medicine and also to learn to communicate effectively.

#### 2. Journal club

Journal club sessions are used by post graduate students to learn to search medical literature, to learn how scientific data is to be disseminated, to develop skills in presentation of research papers, to critically analyse and evaluate data, to become familiar with research methodologies, to keep oneself updated on new developments/emerging trends in biochemistry and to learn to communicate effectively

#### 3. Practical exercises

These exercises are used by post graduate students to equip themselves with knowledge and hand-on skills in various techniques used for laboratory bench-work in biochemistry and molecular biology and in a diagnostic laboratory, and to learn to analyze and interpret data obtained.

#### 4. Thesis

Under the supervision of a Professor or Associate Professor in the Department of Biochemistry, each PG student is expected to generate a hypothesis/research question and design a research protocol to test/answer it. The protocol should have clearly defined objectives and a work plan. The post graduate student will carry out the experimental research work proposed, analyze data, interpret results and write thesis/dissertation based on the work done and results obtained.

#### **5. Presentation of work done on thesis to peers**

A post graduate student of a postgraduate degree course in MD Biochemistry is required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his/her postgraduate studies so as to make him/her eligible to appear at the postgraduate degree examination.

#### **6. Teaching of undergraduates**

Postgraduate students in Biochemistry shall participate in teaching and training programmes of undergraduate students. They should learn how to organize, conduct and co-ordinate UG laboratory teaching in practical classes, to participate in clinical case-based teaching sessions and small group discussions (as part of a team that includes faculty members and senior residents of the department), to develop skills of self-directed learning, effective communication and leadership. They should learn how to work as part of a team and to facilitate learning by students.

#### **7. Horizontal and vertical integration of teaching of Biochemistry with other pre-clinical, para-clinical and clinical departments**

The post graduate students shall take part in integrated teaching of undergraduates by participation in joint teaching sessions and seminars with different departments, participation in clinical rounds for discussing cases of interest and by small group discussions of case-based problems.

#### **8. Training in the basics of medical education and technology**

The post graduate students shall be provided with training in the basics of medical education and technology through workshops at the departmental and/or institutional level.

#### **9. Development of communication skills**

The post graduate students shall develop effective communication skills by making presentations at seminars and journal club sessions and by teaching undergraduates.



#### **10. Training in clinical Biochemistry:**

The post graduate students shall receive hands-on training in a diagnostic laboratory in Biochemistry; such training shall be extensive and rigorous enough for each post graduate student to acquire adequate skills and expertise to manage and supervise such a laboratory. The post graduate students shall be posted in all sections of the laboratory in the institution, starting from sample collection and processing. They shall become proficient in working with the auto analysers in the laboratory, in quality control methods, setting up of a clinical biochemistry laboratory, specialized assays and statistical analysis of data. It acquire experience in running a 24-hours diagnostic laboratory; towards this end, it would help if they are posted in the laboratory out of regular hours as well.

#### **11. Rotation in clinical departments**

The post graduate students shall be posted in clinical departments after their training period in the diagnostic laboratory, for up to 2 months of the course. Suggested departments and durations of postings are as follows:

General medicine - 10days

Endocrinology - 10 days

Hematology - 10 days

Microbiology/Virology -1week

Pediatrics - 1 week

Nephrology- 1 week

These postings will help post graduate students get a better perspective on diagnostic tests in clinical practice and will enable them to contribute more effectively to patient care.

They shall also be posted in the district hospitals as suggested by the NMC ordinance for a period of up to 3 months.

Log Book:

All post graduate students shall maintain a log book that documents all the work that they have done during their years of training. This log book should be checked and assessed periodically by the faculty members involved in the training programme.

12. Department should encourage e-learning activities.

**During the training programme, patient safety is of paramount importance, therefore skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.**

**Suggested reading material:**

**Books (latest editions to be followed)**

1. Harpers Illustrated Biochemistry, Victor W. Rodwell , David Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil, McGraw-Hill Education/Medical.
2. Textbook of Biochemistry with Clinical Correlations, Thomas M. Devlin, John Wiley & Sons.
3. Biochemistry (Stryer), Jeremy M. Berg , John L. Tymoczko, Lubert Stryer, W. H. Freeman.
4. Lehninger Principles of Biochemistry, David L. Nelson, Michael M. Cox. W H Freeman & Co(Sd).
5. Biochemistry: A Case-oriented Approach, Rex Montgomery, Thomas W. Conway, Arthur A. Spector, David Chappell, Mosby
6. The Metabolic and Molecular Bases of Inherited Disease (four volumes). Charles Scriver
7. Biochemistry (Voet & Voet), Donald Voet, Judith G. Voet, John Wiley & Sons Inc.
8. Biochemistry (Lippincott's Illustrated Reviews), Denise R Ferrier , Lippincott Williams and Wilkins.
9. Practical clinical Biochemistry. H. Varley.
10. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, Carl A. Burtis, Edward R. Ashwood, Saunders.
11. Clinical Chemistry - Theory, Analysis, Correlation (Kaplan and Pesce), Mosby
12. Interpretation of Diagnostic tests, Jacques Wallach, Lippincott Williams & Wilkins.
13. Clinical Chemistry: Principles, Techniques, and Correlations, Michael L Bishop, Edward P Fody, Larry E Schoeff, Lippincott Williams and Wilkins.
14. Clinical Biochemistry: Metabolic and Clinical Aspects, William J. Marshall & Márta Lapsley & Andrew Day & Ruth Ayling, Imprint - Church and Livingstone.
15. Textbook of Biochemistry. West and Todd.

16. Kuby Immunology, Judy Owen, Jenni Punt , Sharon Stranford, W. H.Freeman.
17. Harrison's Principles of Internal Medicine, Dennis L. Kasper, AnthonyS.
18. Fauci, Stephen L. Hauser, Dan L. Longo, J. Larry Jameson, Joseph Loscalzo, McGraw- Hill Education / Medical.
19. Davidson's Principles and Practice of Medicine, Walker, Elsevier Health Sciences – UK.
20. Methods in Biostatistics. B.K.Mahajan.
21. Basic Biotechnology. R.Colin. Cambridge.

### **Journals**

03-05 international Journals and 02 national (all indexed) journals

#### **International Journals:**

1. Clinical Chemistry
2. Annals of Clinical Biochemistry
3. Clinical Biochemistry
4. Clinica Chimica Acta
5. Biochemia Medica
6. Journal of Clinical Investigation
7. Annual Review of Biochemistry
8. Clinical chemistry reviews
9. Journal of Clinical Endocrinology and Metabolism
10. Diabetes care
11. Free Radical Biology and Medicine
12. Annual review of Biochemistry

#### **Indian Journals**

1. Journal of Clinical and Scientific Research
2. Indian Journal of Clinical Biochemistry
3. Indian Journal of Medical Biochemistry
4. Indian Journal of Medical Research
5. Indian Journal of Endocrinology and Metabolism
6. Indian Journal of Nephrology

**VII. ANNEXURE 1**

**POSTGRADUATE STUDENTS APPRAISAL FORM**

Name of the Department :

Name of the PG Student :

Period of Training :FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis / Research work										
7.	Log Book Maintenance										

Publications Yes/No

Remarks\* \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For Score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE of ASSESSEE

SIGNATURE OF COURSE IN-CHARGE  
FACULTY

SIGNATURE OF HOD

## **VIII. ASSESSMENT**

### **FORMATIVEASSESSMENT, ie. during the training**

#### **General Principles**

Internal Assessment shall be frequent covering all domains of learning and used to provide feedback to improve learning; it shall also cover professionalism and communication skills. The Internal Assessment shall be conducted in theory and practical/clinical examination.

#### **Quarterly assessment during the MD training shall be based on:**

1. Journal based / recent advances learning
2. Patient based / Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

**SUMMATIVE ASSESSMENT** ie., assessment at the end of training . The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 as amended from time to time. The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

#### **Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.

2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfill attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination , by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three concerned examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

**Format of the Examination:**

1. Postgraduate examinations, consists of Thesis , Theory Papers, and Clinical/Practical and Oral examinations.

2. **Thesis:** Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.
- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.
- **The thesis topic shall be chosen before the end of eight months from the date of joining the course.** The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report (as per university regulations) six months before the Theory and Clinical / Practical examination.
- The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis

## **Theory:**

i) There shall be 4 theory papers each of three hours duration:

**Paper I: Biomolecules, cell biology, biochemical techniques, biostatistics and research methodology, basics of medical education in teaching and assessment of biochemistry**

**Paper II: Enzymes, bioenergetics, biological oxidation, metabolism of biomolecules, intermediary metabolism and regulation, inborn errors of metabolism and nutrition**

**Paper III: Molecular biology, molecular and genetic aspects of cancer, immunology and effects of environmental pollutants on the body**

**Paper IV: Basic principles and practice of clinical biochemistry, Laboratory management along with Total quality management and analytical techniques, Clinical correlates and analytical procedures including molecular diagnostics related to different body systems/organs, endocrinology, and recent advances in biochemistry**

ii) The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.

iii) Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.

The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.

iv) Moderation of Question Papers :

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers

1. One Senior Faculty member each from medical and surgical specialty, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean



## 1. Practical and oral/viva voce examination:

This should be held over two days.

**Practical examination for the subjects in Basic Medical Sciences shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/Laboratory studies and his ability to perform such studies as are relevant to his subject.**

The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

### **Practical examination**

A. A clinical case for which an actual patient or a paper-based case may be used, as per the facilities available in each institution running the course. The clinical features of the patient and relevant laboratory investigation of biochemical abnormalities present will be discussed

#### **[Experiment 1**

50 Marks

Question involving estimation of at least two parameters using end point assay. One of them to be estimated along with calibration curve and within run precision.]

B. Performance of ELISA technique for assay of hormone/tumor marker and its interpretation.

#### **[Experiment 2**

40 Marks

Question involving assay of hormone/ tumor marker by ELISA.]

C. Question involving screening tests for inborn errors/body fluid analysis]

#### **[Experiment 3**

20 Marks

Question involving Screening tests for inborn errors/body fluid analysis]

D. Identification the carbohydrate/amino acid provided and confirm of its identity by paper chromatography, Urine analysis /Performance of an electrophoresis for serum proteins and discussion of electrophoretic pattern.

#### **[Experiment 4**

50 Marks

Question involving performance of Chromatography Or Electrophoresis.]

**E.** Quality Control data and its interpretation, Data analysis using Microsoft excel spread sheets, Clinical investigation graphs and their interpretation: to assess interpretative skills

**[Experiment 5**

**40 Marks**

Data presentation and analysis using excel spreadsheet solutions along with drawing of conclusions Clinical investigation reports in the form of lab reports, graphs, charts etc – for interpretation of results.]

Viva-voce Examination

**Viva-voce Examination: This shall be done under two headings and shall carry 100 marks**

1. A. Thesis presentation (of about 15 mins duration)  
B. Pedagogy (20 mins duration plus 10 mins for questions) (A and B: 20 marks)
2. Grand viva: 80 marks

**Scheme of examination**

**a) The examination for the degree shall consist of written exams, clinicals / practicals and viva voce. b) The examination shall be conducted ordinarily twice a year.**

Paper	Duration	Marks
Theory paper-1	3 hours	100
Theory paper-2	3 hours	100
Theory paper-3	3 hours	100
Theory paper-4	3 hours	100
Clinicals/Practicals		200
Viva-voce		100

**Clinical/Practical and viva-voce examination will be of two days duration.**

**Thesis**

The student should submit Thesis six months before the final examination. Those students who have not submitted the thesis shall not be allowed to appear for the final examination. Only those students whose theses have been approved by three examiners shall be eligible to appear for the final examination.

Thesis work shall be done under the guidance of the faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

Co-guide: Faculty of the cadre of Assistant Professor and above from the same or other departments who are involved in guiding the student may be proposed as co-guides by the guide subject to approval by the head of the department and the dean.

### **Internal assessment**

Periodically assessment of the candidate shall be done at least twice in a year. The internal assessment includes Theory and Practical examinations. The marks obtained will not be considered for university examination.

### **Eligibility for award of degree**

A candidate shall be declared to have become eligible for the award of M.D. degree in biochemistry provided he/ she obtains in the final examination 40% marks in each theory paper and not less than 50% cumulatively in all the four papers and 50% of the marks in clinicals/ practicals and viva voce put together.

### **Panel of examiners**

a) There shall be a panel of eight external examiners as advised by the Head of the department and approved by the Director.

b) Theory paper setting to be done by the examiners from outside the state of Andhra Pradesh who may or may not involved in the concerned Clinical/Practical examination.

c) No. of Examiners Required - Four  
No. of Internal Examiners - Two  
No. of External Examiners - Two

At least 50% of the external examiners should be from outside the state of Andhra Pradesh.

Internal examiners may be from within the institute / within or outside Andhra Pradesh.

### **Appointment of Examiners:**

1. No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
2. If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
3. An examiner shall ordinarily be appointed for not more than two consecutive terms
4. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.
5. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .
6. There shall be a panel of 8 External Examiner as advised by the HOD concerned. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

#### **Marking System for the Examination:**

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

### **EXAMINATION PATTERN**

#### **THEORY EXAMINATION**

- Paper I: Biomolecules, cell biology, biochemical techniques, biostatistics and research methodology, basics of medical education in teaching and assessment of biochemistry
- Paper II: Enzymes, bioenergetics, biological oxidation, metabolism of biomolecules, intermediary metabolism and regulation, inborn errors of metabolism and nutrition
- Paper III: Molecular biology, molecular and genetic aspects of cancer, immunology and effects of environmental pollutants on the body

Paper IV: Basic principles and practice of clinical biochemistry, Laboratory management along with Total quality management and analytical techniques, Clinical correlates and analytical procedures including molecular diagnostics related to different body systems/organs, endocrinology, and recent advances in biochemistry

### MODEL QUESTION PAPER

Each theory paper : Duration 3 hours 100 X 4 = 400 Marks

1. Ten questions 10 marks each

Practical examination: Duration : 2 days 200 Marks

1. Experiment 1 50 Marks

Question involving estimation of at least two parameters using end point assay. One of them to be estimated along with calibration curve and within run precision.

2. Experiment 2 40 Marks

Question involving assay of hormone/ tumor marker by ELISA.

3. Experiment 3 20 Marks

Question involving Screening tests for inborn errors/body fluid analysis

4 Experiment 4 50 Marks

Question involving performance or Chromatography Or Electrophoresis

5. Experiment 5 40Marks

Interpretative skills –

Data presentation and analysis using excel spreadsheet solutions along with drawing of conclusions Clinical investigation reports in the form of lab reports, graphs, charts etc – for interpretation of results.

**Viva voce examination** 100 Marks

1. General viva voce. 80 Marks

2. Thesis presentation (of about 15 mins duration)

Pedagogy (20 mins duration plus 10 mins for questions) 20 Marks

**Total 700 Marks**

### **IX. (LOG BOOK)**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUPATI  
(A University Established Under the State Act)**



**LOG BOOK FOR POSTGRADUATES  
MD [Biochemistry].**

**Name of the Candidate** :.....

**Date of Admission** : .....

**Admn. No.** : .....

**DETAILS OF POSTINGS OVER 3 YEARS**

**1<sup>ST</sup> YEAR**

MONTH	AREA OF POSTING
May	
June	
July	
August	
September	
October	
November	
December	
January	
February	
March	
April	

Signature of Faculty:

Total:

**2<sup>nd</sup> YEAR**

MONTH	AREA OF POSTING
May	
June	
July	
August	
September	
October	
November	
December	
January	
February	
March	
April	

Signature of Faculty:

Total:

**3<sup>rd</sup> YEAR**

MONTH	AREA OF POSTING
May	

June	
July	
August	
September	
October	
November	
December	
January	
February	
March	
April	
May	
June	

**Signature of Faculty:**

**Total:**

**NIGHT DUTY 1st year :** Timings :- 6 PM-6 AM, with 2 hours break in between  
**Nature of work :-** To attend to emergency and critical samples reporting.

**They should inform any problems in the laboratory to the faculty on call.**

Month	Dates	
May		
June		
July		
August		
September		
October		
November		
December		
January		
February		
March		
April		

**Signature of Faculty:**

**Total:**

**NIGHT DUTY 2<sup>nd</sup> year :** Timings :- 6 PM-6 AM, with 2 hours break in between  
**Nature of work :-** To attend to emergency and critical samples reporting.  
**They should inform any problems in the laboratory to the faculty on call.**



Month	Dates	
May		
June		
July		
August		
September		
October		
November		
December		
January		
February		
March		
April		

Signature of Faculty:

Total:

NIGHT DUTY 3<sup>rd</sup>year : Timings :- 6 PM-6 AM, with 2 hours break in between  
 Nature of work :- To attend to emergency and critical samples  
 reporting.

They should inform any problems in the laboratory to the faculty on call.

Month	Dates	
May		
June		
July		
August		
September		
October		
November		
December		
January		
February		
March		
April		

HOD

Signature of the student

PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

NAME OF THE POSTGRADUATE

:

PERIOD OF ASSESSMENT

:

DATE

TO  
YEAR

MONTH  
DATE

YEAR  
MONTH

DATE

TO  
YEAR

MONTH  
DATE

YEAR  
MONTH

DATE

TO  
YEAR

MONTH  
DATE

YEAR  
MONTH

POSTING DURING ABOVE PERIOD

: CLINICAL LAB

Areas of exposure : Validation of clinical laboratory reports, method evaluation, internal quality assurance.

ASSESSMENT DONE BY :

QUALITY BEING ASSESSED

GRADE

1. Lab reporting/ student training
2. Academic Knowledge About laboratory
3. Curiosity about unexplained Observations
4. Academic Presentation
5. Punctuality / discipline

OVERALL GRADE

A- Good

B- Satisfactory

C- Poor

PROFORMASHOWN TO POSTGRADUATE CONCERNED :

SIGNATURE OF CONCERNED POSTGRADUATE :

CONCERNED FACULTY :

**PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES**

**NAME OF THE POSTGRADUATE :**

**PERIOD OF ASSESSMENT :**

**DATE**

**DATE**

**DATE**

**TO  
YEAR**

**TO  
YEAR**

**TO  
YEAR**

**MONTH YEAR**

**DATE**

**MONTH YEAR**

**DATE**

**MONTH YEAR**

**DATE**

**MONTH**

**MONTH**

**MONTH**

**POSTING DURING ABOVE PERIOD**

**: UG LAB**

**Areas of exposure : Undergraduate practicals, basics of laboratory work preparation of reagents and solutions end point and kinetic assays.**

**ASSESSMENT DONE BY :**

**QUALITY BEING ASSESSED**

**GRADE**

1. **Lab reporting/ student training**
2. **Academic Knowledge About laboratory**
3. **Curiosity about unexplained Observations**
4. **Academic Presentation**
5. **Punctuality / discipline**

**OVERALL GRADE**

**A- Good**

**B- Satisfactory**

**C- Poor**

**PROFORMASHOWN TO POSTGRADUATE CONCERNED :**

**SIGNATURE OF CONCERNED POSTGRADUATE :**

**CONCERNED FACULTY :**

**PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES**

**NAME OF THE POSTGRADUATE :**

**PERIOD OF ASSESSMENT :**

**DATE**    **TO**   **YEAR** **MONTH YEAR**  
**DATE**   **MONTH**

**DATE**    **TO**   **YEAR** **MONTH YEAR**  
**DATE**   **MONTH**

**DATE**    **TO**   **YEAR** **MONTH YEAR**  
**DATE**   **MONTH**

**DATE**    **TO**   **YEAR** **MONTH YEAR**  
**DATE**   **MONTH**

**POSTING DURING ABOVE PERIOD : PG LAB**

**ASSESSMENT DONE BY :**

**QUALITY BEING ASSESSED** **GRADE**

- 1. **Lab reporting/ student training**
- 2. **Academic Knowledge About laboratory**
- 3. **Curiosity about unexplained Observations**
- 4. **Academic Presentation**
- 5. **Punctuality / discipline**

**OVERALL GRADE**

**A- Good** **B- Satisfactory** **C- Poor**

**PROFORMA SHOWN TO POSTGRADUATE CONCERNED :**

**SIGNATURE OF CONCERNED POSTGRADUATE :**

**CONCERNED FACULTY :**

**THEORY/TUTORIAL/PRACTICAL CLASSES TAKEN**

<b>TOPIC</b>	<b>COURSE FOR WHICH TAKEN</b>

**PRACTICAL CLASSES**


**HOD**

## SEMINARS PRESENTATIONS

S.No.	Date	Topic	Moderator	Signature of Moderator

HOD

### Guide lines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\*Corollary Grading in all Checklists:

Poor-0,Satisfactory-1,Average-2,Good-3,VeryGood-4.

**JOURNAL CLUB PRESENTATIONS**

S.No.	Date	Topic	Moderator	Signature of Moderator



Guidelines for evaluation of Journal presentations

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material, Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper/ subject
6.	Audio-Visual aids used
7.	Ability to analyse the paper and co-relate with the Existing knowledge
8.	Clarity of presentation
9.	Any other observation

\*Corollary Grading in all Checklists:  
 Poor-0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**INTERDEPARTMENTAL SEMINARS**

S.No.	Date	Topic	Moderator	Signature of Moderator

**AUDIENCE :** The interdepartmental seminars are attended by faculty and post graduate students of all the departments in the institute as well as by the Dean and Director of the institute.

**Thesis topic** :

**Ethical committee approval** :

**Thesis committee approval** :

**Guide** :

**Co-guide** :

**HOD**

**LIST OF CASE DISCUSSIONS PRESENTED / ATTENDED**

<b>Date</b>	<b>Topic</b>	<b>Moderator</b>	<b>Signature of supervising Faculty</b>

**HOD**

**EQUIPMENT FOR WHICH HANDS ON EXPERIENCE GAINED**

S.No.	EQUIPMENT

**HOD**

**CONFERENCES ATTENDED**

<b>Date</b>	<b>Name</b>	<b>Role</b>

**PUBLICATIONS**

<b>Date</b>	<b>Topic</b>	<b>Journal</b>	<b>Role</b>

**HOD**

**LEAVES TAKEN**

Date	Reason	Signature of Head of Department

### SUMMARY OF LOGBOOK

(To be filled at the end of the course & retained in this book)

Name of the student: \_\_\_\_\_ Admn.No. \_\_\_\_\_

Name of the Course: \_\_\_\_\_ From \_\_\_\_\_ To \_\_\_\_\_

Name of the Institute: \_\_\_\_\_

- |    |                                  |                 |               |
|----|----------------------------------|-----------------|---------------|
| 1) | No.of Seminar presentations      | :Presented..... | Attended..... |
| 2) | No.of Journal club Presentations | :Presented..... | Attended..... |
| 3) | No.of Clinical Presentations     | :Presented..... | Attended..... |
| 4) | No.of Case Presentations         | :Presented..... | Attended..... |
| 5) | No.of UG Teaching Programms      | :Conducted..... | Attended..... |

(Theory class/ Clinics/ Practicals/ Demonstrations/ Tutorials)

- |     |  |                 |               |
|-----|--|-----------------|---------------|
| 6)  | No.of PG Teaching Programmes           | :Attended       |               |
| 7)  | Special techniques:                    |                 |               |
|     | Performed                              | Assisted        |               |
| 8)  | No.of Clinico Pathological Conference  | : Attended..... |               |
| 9)  | No.of special investigations           | :Performed..... | Assisted..... |
| 10) | No.of events attended Conferences..... | Symposia.....   |               |
|     |  | Workshops.....  | CME.....      |
| 11) | Any other activities                   | :               |               |

*Signature of the candidate*

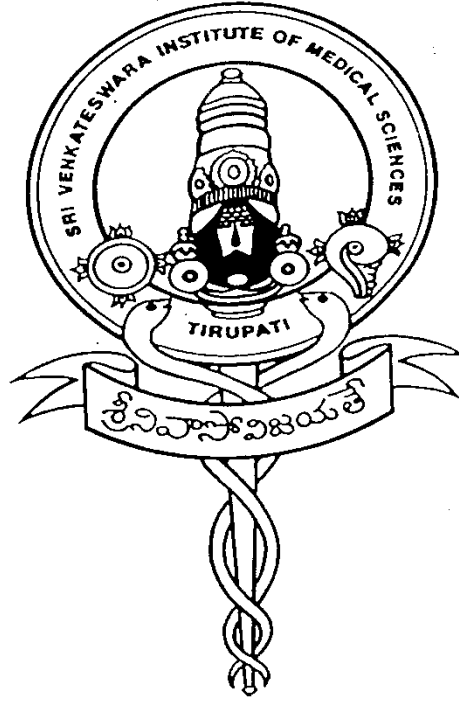
*Signature of the Course In-charge*

*Signature of the HoD  
With seal*

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI - 517 507**



**M.D. - EMERGENCY MEDICINE**

**COMMON BOARD OF STUDIES MEETING**

**ON 22.07.2021**

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**TIRUMALA TIRUPATI DEVASTHANAMS**



**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES  
TIRUAPATI**

**M.D. (EMERGENCY MEDICINE)**

**COMMON BOARD OF STUDIES MEETING ON 22.07.2021**

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# SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI

## M.D. (EMERGENCY MEDICINE)

### COMMON BOARD OF STUDIES MEETING ON 22.07.2021

#### List of Members

1. Dr. B.Siddhartha Kumar - Vice Chairman  
Dean, SVIMS, Tirupati.
2. Dr. K.V.Sreedhar Babu - Member  
Registrar, SVIMS, Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr Vivekanandan - External expert  
Professor & Head  
Dept. of Emergency Medicine  
JIPMER, Pondicherry
5. Dr A. Krishna Simha Reddy - Internal Expert  
Professor  
Dept. of Emergency Medicine  
SVIMS, Tirupati
6. Dr. Ram - Internal Expert  
Professor and HOD of Nephrology  
SVIMS, Tirupati

## I. REGULATIONS

a) **Short Title and Commencement**

The programme shall be called Doctor of Medicine ( Emergency Medicine )

b) **Eligibility for admission:**

A candidate seeking admission into the course shall have MCI / NMC recognized MBBS qualification.

c) **Admission:**

In order to be **eligible** for admission to any postgraduate course in a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in 'National Eligibility-cum- Entrance Test for Postgraduate courses' held for the said academic year.

d) **Duration of the course:**

The duration of the course shall be three calendar years (including the period of examination).

e) **Bond:**

- i. The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/- value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. **5,00,000/- (Rupees Five Lakhs only)** along with the full stipend amount received by him/her back to the Institute.
- ii. The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.**20,00,000 (Rupees Twenty lakhs only)**.

**f) Training Programme:**

The candidate joining the course must work as full time Resident during the period of Post Graduate Training.

*Note: In-Service candidate will not be paid stipend if He / She draws leave salary in that parent institution.*

**g) External training:**

The residents are permitted for external posting during the training period on payment of stipend for a period not exceeding one month as per the need and on recommendation of the HoD. The request for such training shall be submitted to the Dean, SVIMS through proper channel, two months in advance in order to process with the institution where the posting is required. The expenditure towards travel, accommodation and fees shall be borne by the individual.

**h) Research Methodology:**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

**i) Attendance:**

All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

**j) Thesis:**

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the examiners.

**k) District Residency Programme (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as **“District Residency Programme (DRP)”** and the postgraduate medical student undergoing training shall be termed as a **“District Resident”**.

**POSTING SCHEDULE**

During 1<sup>st</sup> and 3<sup>rd</sup> years , the post graduates are posted in the department and in 2<sup>nd</sup> year they are rotated in other departments as follows;

2<sup>nd</sup> Year

Sl. No.	Month	Area of posting	Department / unit	No. of night duties
1.	1 <sup>st</sup>	Medicine		
2.	2 <sup>nd</sup>	Cardiology		
3.	3 <sup>rd</sup>	General Surgery		
4.	4 <sup>th</sup>	Orthopedics		
5.	5 <sup>th</sup>	Pediatrics		
6.	6 <sup>th</sup>	ICU		
7.	7 <sup>th</sup>	ENT and Skin & VD		
8.	8 <sup>th</sup>	Ophthalmology and Psychiatry		
9.	9 <sup>th</sup>	Anesthesiology and Radiology		
10.	10 <sup>th</sup>	OBG & Gynecology and Neurology		
11.	11 <sup>th</sup>	Neurosurgery and Plastic Surgery		
12.	12 <sup>th</sup>	Casualty		

## II. ASSESSMENT

### a) FORMATIVE ASSESSMENT:

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

#### General Principles:

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based / Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form. The results of formative assessment should be maintained in the student appraisal form itself and communicated in the same format to the Examination Section while applying for the Summative Examination.

- **Internal Assessment:**

Internal assessment should be done daily to assess the training and to identify the strengths and weaknesses of the postgraduate student.

1. Log Book (Appendix 1) with details of duration of postings, skills performed with remarks of the Teacher / Faculty member will be maintained and periodically updated by the postgraduate student.
2. Research work to be assessed and reviewed once in four months by the guide and the Head of the Department.
3. Evaluation sheets for seminar and journal clubs with the following points for the purpose of assessment.

- (i) Choice of article / topic (unless specifically allotted).

- (ii) Completeness of presentation.
- (iii) Clarity and cogency of presentation.
- (iv) Understanding of the subject and ability to convey the same.
- (v) Whether relevant references have been consulted.
- (vi) Ability to convey points in favour and against the subject under discussion.
- (vii) Use of audio-visual aids.
- (viii) Ability to answer questions.
- (ix) Time scheduling.
- (x) Overall performance.

#### **b) SUMMATIVE ASSESSMENT:**

**Summative Assessment** i.e., assessment at the end of training . The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 as amended from time to time. The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

#### **Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than

eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.

3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three examiners concerned.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

### **III. FORMAT OF THE EXAMINATION**

The examinations shall be organized to evaluate and certify candidate level of knowledge, skill and competence at the end of the training. The examination for MD in Emergency Medicine shall be held at the end of 3<sup>rd</sup> academic year.

Postgraduate examinations, in any subject shall consist of Thesis , Theory Papers, and Clinical/Practical and Oral examinations.

#### **1. Thesis**

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a thesis. The thesis work is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.



- **Guide :**

The thesis work shall be done under the guidance of the faculty recognized as post graduate teacher as per the norms laid down by the MCI. However, the decision of the HOD concerned is final in allocation of guide to each post graduate.

- **Co-guide:**

The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.

- **The Thesis topic:**

The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the thesis protocol approval committee (TPAC) constituted by the institution, during its meeting proposed to be held in the month of January every year.

- After obtaining approval from TPAC, the thesis protocol shall be submitted in February to Institutional Ethics Committee (IEC) for clearance.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II), six months before the Theory and Clinical / Practical examination
- The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical / Viva examination. .
- The Guide and Co-Guides cannot be nominated as external or internal examiners for evaluation of thesis.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the Head of the Department.. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

- **Change of guide:**

In the event of a registered guide leaving the college for any reason or in the event of death, the guide, may be changed with prior permission from the Committee constituted by the Head of the Department and the Dean.

## **2. Theory:**

There shall be four theory papers, each of 3 hours duration. Out of these one shall be of Basic Medical Sciences and one shall be on recent advances

4 Theory papers 100 marks for each paper. Total - 400 Marks

Applicable to all papers uniformly: 10 questions x 10 marks = 100 marks

Total - 400 Marks

Choices: Nil

<b>Paper Title</b>	<b>Duration</b>	<b>Marks</b>
1) Applied Basic Sciences applicable to Emergency Medicine	3 Hrs	100
2) Medical Emergencies in Adult and Pediatrics	3 Hrs	100
3) General Principles of Emergency Care in Surgery and Surgical Specialties	3 Hrs	100
4) Recent Advances in Emergency Medicine	3 Hrs	100

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.

- Moderation of Question Papers :

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

**3. Clinical/Practical & Viva Voce Examination :**

- Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.
- The maximum number of candidates to be examined in Clinical and Oral on any day shall not exceed eight for M.D degree .

**Marks for Practical/Clinical & Viva voce ( Total 300 marks)**

Practical/Clinical examination shall consist of carrying out special investigative techniques for Diagnosis and Therapy.

**Practical / Clinicals (one day) 200 marks**

- One long case - 100 marks
- Short cases 2 (50x2) - 100 marks

**Viva Voce: 100 marks**

Skill stations

- ACLS - ABG
- ATLS - Drugs
- 2D Echo - Instruments
- ECG - Ventilator
- Radiology station

Total: -----  
300 marks  
-----

### **Marking System for the Examination :**

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.
4. The above class will not be awarded if the candidate shall not complete the course within the duration of the course period. Such candidates will be treated under "Pass" category.

### **Appointment of Examiners :**

- All the Post Graduate Examiners shall be recognized Post Graduate Teachers holding recognized Post Graduate qualifications in the subject concerned.
- No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
- As per MCI, the Teachers in a medical college or institution having a total of 8 years teaching experience out of which at least 4 years teaching experience as Assistant Professor with at least one research publication in indexed journals gained after obtaining postgraduate degree shall be recognized as post graduate teacher in broad specialties.
- For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .
- There shall be a panel of eight external examiners from outside the state as advised by the Head of the department. The Controller of Examinations shall have the

powers to appoint two examiners from among the panel of examiners recommended by the HOD.

- Total number of examiners required - Four
  - Internal Examiners - Two
  - External Examiners - Two
  
- The Controller of Examinations shall have the powers to appoint two external examiners from among the panel of examiners recommended by the HOD.
  
- No. of Internal Examiners - Two (HoD and one eligible PG Teacher). If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
  
- An examiner shall ordinarily be appointed for not more than two consecutive terms.
  
- The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

#### IV. SYLLABUS

##### **Pre-hospital Care**

Emergency Medical Services  
Prehospital Equipment and Adjuncts  
Air Medical Transport  
Neonatal and Pediatric Transport  
Mass Gatherings

##### **Disaster Preparedness**

Disaster Medical Services

- Bioterrorism Response: Implications for the Emergency Clinician
- Disaster management for Chemical Agents of Mass Destruction
- Blast and Crush Injuries
- Radiation Injuries

## **Resuscitative Problems and Techniques**

Sudden Cardiac Death  
Basic Cardiopulmonary Resuscitation in Adults,  
Neonatal Resuscitation and Emergencies,  
Pediatric Cardiopulmonary Resuscitation and  
Pediatric Airway Management  
Resuscitation Issues in Pregnancy,  
Ethical Issues of Resuscitation  
Noninvasive Airway Management  
Tracheal Intubation and Mechanical Ventilation  
Surgical Airway Management,  
Vascular Access  
Invasive Monitoring,  
Pacing Techniques, and  
Automatic and Implantable Defibrillators  
Cerebral Resuscitation, Newer Resuscitative Techniques and Acid-Base Disorders  
Blood Gases: Pathophysiology and Interpretation Fluid and Electrolyte Problems  
Disturbances of Cardiac Rhythm and Conduction, Pharmacology of  
Antidysrhythmic and Vasoactive medications

## **TRAUMA CARE**

### **Traumatic Disorders**

#### **Principles of care**

Prehospital trauma care and Triage  
Resuscitation and stabilization  
Hemorrhagic shock, Neurogenic shock  
Role of emergency physician, Team response, Reassessment and monitoring  
Diagnosis, Treatment, Consultation, Disposition  
Injury prevention and control

#### **Cause of injury**

Homicide, Suicide, Family violence, Motor vehicle crashes, Falls, Drowning/near drowning, Poisoning, Burns and fire related injuries, Occupational injuries

#### **Radiological evaluation**

Plain radiography, Contrast radiography, CT scan, Angiography, MRI, Ultrasound

#### **Mechanism of injury**

Blunt, Penetrating

- Gunshot wounds
- Stab wounds Kinematics

## **Diagnosis and management by anatomic areas**

Head trauma

Scalp lacerations/avulsions, Skull fractures, Brain concussions, contusions, Intracranial hematomas, Brain stem injuries, Penetrating head trauma, Cerebro spinal fluid leaks

## **Spinal cord and peripheral nervous system trauma**

Complete spinal cord injuries, Incomplete cord injuries, Cauda equina injuries  
Nerve root injuries Brachial and lumbo sacral injuries, Peripheral nerve injuries

## **Injuries of the spine**

Fractures

- Cervical, Thoracic, Lumbar, Sacral/coccygeal
- Dislocations/subluxations
- Dislocations/subluxations
- Unilateral facet
- Bilateral facet Ligamentous injuries
- Ligamentous injuries

## **Facial fractures**

Frontal sinus, Mandibular, Maxillary, Nasal, Orbital  
Dental fractures and avulsions, Zygomatic

## **Soft tissue facial injuries**

Complex lacerations, Avulsions, Severe abrasions, Parotid gland/duct injuries,  
Nerve injuries

## **Ophthalmologic trauma**

Corneal abrasions/lacerations, Foreign bodies, Iritis, Hyphema, Lens dislocations,  
Retinal detachment, Penetrating globe injuries, Eyelid lacerations, Lacrimal duct  
injuries Corneal burns

- Acid
- Alkali
- Ultra violet

## **Otologic trauma**

Lacerations and Avulsions  
Sub-pericondrial hematoma Tympanic membrane perforation

## **Neck trauma**

Vascular injuries

Carotid artery, Internal and external jugular veins, Thoracic duct Penetrating neck  
trauma, Anterior and posterior triangle injuries

## **Laryngotracheal injuries**

Lacerations and Crush injuries  
Vocal cord avulsions/hematomas Fracture larynx  
Tracheal transection Compression with hematomas

## **Chest trauma**

Penetrating chest trauma, Rib fractures, Sternal fractures, Flail chest, Clavicle fracture/dislocation, Aortic disruption, Myocardial contusion, Pulmonary contusion, Pericardial tamponade, Vascular injuries, Tracheo bronchial tree injuries, Pneumo thoraces, Hemothorax

## **Abdominal trauma**

Penetrating abdominal trauma Abdominal wall contusion Solid-viscus injuries, Hollow viscus injuries Vascular injuries Diaphragmatic rupture Evisceration, Mesenteric avulsion, hematoma Bladder rupture, contusion Renal injuries, Ureteral injuries

## **Upper extremity bones and joints**

## **Lower extremity bones and joints**

### **Pelvic fractures**

Pubic rami, Straddle, Iliac crest, Malgaigne

### **Soft tissue extremity injuries**

Tendon injuries, Periarticular injuries, Injuries to joints, Compartment syndromes/crush injuries, Penetrating soft tissue injuries, Degloving injuries, Amputations/replantation, Vascular injuries

## **Injuries of the genitalia**

### **Cutaneous injuries**

Lacerations, Avulsions, Burns, Puncture wounds, Bite wounds

### **Poly trauma / multiple skeletal injuries**

### **Trauma in pregnancy**

Principles of care, Clinical assessment and management  
Anatomic/physiologic alterations in the pregnant woman

Fetal monitoring, Emergency department cesarean section Type of injuries, Uterine rupture, Placental abruption, Preterm labor, inutero injuries to the fetus, Penetrating injuries to the uterus

## **Special considerations for pediatric trauma victim**



## UROGENITAL / GYNAECOLOGICAL DISORDERS

### Genital tract/ female

#### Ovarian disorders

Ovarian cyst, Ovarian torsion

### Vagina and vulva

#### Uterus

Endometriosis, Dysfunctional uterine bleeding, Tumors

### Infectious disorders

#### Genital tract/ Male

Congenital, Structural, Inflammatory/ infection

### Sexual assaults

### When Pregnancy is not likely -abdominal pain and abnormal vaginal bleeding

Ectopic pregnancy, Abortions - Molar pregnancy, Twisted ovarian tumors, Emergency contraception, Rape victims, Domestic battering

## CLINICAL PHARMACOLOGY

### Principles

Pharmacokinetics  
Drug interactions  
Allergic reactions  
Drugs in pregnancy / breast feeding  
Effect of age  
Withdrawal syndrome  
Neonatal / pediatric considerations

### Drug classes

- Drugs acting on various systems
- CVS
  - Nervous System
  - Respiratory System
  - GIT
  - Blood
  - Genito Urinary System
  - Immune System
  - Drugs used in Anaesthesia
  - Psychiatric Drugs
  - Antibiotics

## MEDICINE

### ENDOCRINE, METABOLIC AND NUTRITIONAL DISORDERS

Acid base balance and its disturbances

Fluid and electrolyte and its disturbances

Normal Glucose metabolism

Diabetes mellitus

- Diabetic ketoacidosis
- Hyper osmolar coma
- Hypoglycemic syndrome

Nutritional disorders

Endocrine Emergencies

### ENVIRONMENTAL DISORDERS

Diving emergencies by drowning

Acute gas embolism

Decompression sickness

**Submersion incidence**

Cold water immersion+

Near drowning

Electrical injury

Lightning injury

AC/DC current

High voltage

High altitude illness

Acute mountain sickness

High-altitude cerebral edema

High-altitude pulmonary edema

Radiation injury

Poisonous plants

Smoke inhalation

Temperature related illness

Heat

Cold

- Hypothermia
- Frost bite

## **Bites and stings**

- Insects
- Scorpions
- Reptiles
- Snake

## **HEMATOLOGICAL DISORDERS**

### **Hemostatic disorders**

#### **Congenital and acquired disorders of clotting and bleeding**

### **Red Blood cell disorders**

Anemias  
Polycythemia  
Haemoglobinopathies

### **Transfusions**

Principles of blood transfusion

- Auto transfusion
- Massive transfusions
- Component therapy
- Synthetic blood replacement
- Indications for transfusion

## **IMMUNE SYSTEM DISORDERS**

### **Hypersensitivity**

Anaphylactic/anaphylactoid reactions, Angioedema  
Allergic rhinitis, Drug allergies, Serum sickness

## **SYSTEMIC INFECTIOUS DISORDERS**

### **Bacterial**

- Botulism
- Gas gangrene
- Bacteremia and sepsis
- SIRS
- Mycobacterial infections
  
- Meningococemia
- Plague
- Tetanus
- Dengue
- Typhoid
- Toxic shock syndrome
- Spirochaetes
- Chlamydia
- Mycoplasma

## **Protozoal - parasites**

Malaria

## **Viral**

HIV

Infectious mononucleosis

Dengue

Chicken pox

Influenza, H, N,

Mumps

Polio

Rabies

Rubella

Roseola

Varicella/zoster

Herpes simplex

## **Travel related**

### **Prevention**

Prophylaxis

Immunisations

## **MUSCULOSKELETAL DISORDERS (NON TRAUMATIC)**

### **Joint abnormalities**

Arthritis

- Septic
- Gout
- Collagen vascular
- Degenerative Osteochondritis dissecans

### **Disorders of the spine**

Ankylosing spondylitis

Spondylolysis / spondylolisthesis

Disc disorders

- Herniated nucleus pulposus
- Discitis

Low back syndromes

- Acute sprain
- Sacroiliitis
- Sciatica
- Cauda equina syndrome
- Spinal stenosis
- Overuse syndromes
- Tendinitis
- Bursitis
- Fibrositis

- Muscle strains
- Carpal tunnel syndrome Muscle abnormalities
- Muscular dystrophies
- Rhabdomyolysis
- Myositis
- Soft tissue infections
- Necrotising fasciitis
- Gangrene
- Paronychia
- Felon
- Tenosynovitis

## **NERVOUS SYSTEM DISORDERS**

### **Cerebro vascular accidents**

### **Cranial nerve disorders**

Bell's palsy

Trigeminal neuralgia

Other cranial nerves

### **Demyelinating disorders**

Multiple sclerosis

### **Infections/ inflammatory disorders**

Abscess

- Brain
- Epidural Encephalitis
- Meningitis
- Myelitis
- Neuritis

### **Neuromuscular disorders**

Landry's / Guillain - Barre syndrome

Myasthenia gravis

Amyotrophic lateral sclerosis

### **Peripheral neuropathy**

Compression syndromes

Toxic and other neuropathies

### **Spinal cord compression**

### **Seizure disorders**

Status epilepticus

Focal seizures

Generalised seizures  
Pseudo seizures

Headache  
Acute spinal cord injury  
Management of radiculopathy  
Myopathy Status epileptus  
Acute neuro muscular respiratory failures  
Management Unconscious patients

### **PSYCHOBEHAVIORAL DISORDERS**

Acute psychiatric emergencies and complications of drug abuse  
overdose of psychiatric

### **RENAL DISORDERS**

- AKI
- Dialysis
- CCRT
- Obstruction Uropathy

### **RESPIRATORY DISORDERS**

Acute upper airway obstruction  
Acute upper airway infection  
Foreign body airway  
Disorders of pleura, mediastinum and chest wall

- Costochondritis
- Mediastinal masses
- Mediastinitis
- Pleural effusions/ empyema
- Pleurisy
- Pneumomediastinum
- Pneumothorax
  - Spontaneous Pneumothorax
  - Iatrogenic
  - Tension Pneumothorax

Non cardiogenic pulmonary edema

- Obstructive restrictive lung disease
- Asthma
- Bronchitis
- Chronic obstructive pulmonary disease
- Industrial exposure of Physical and chemical irritants
- Corrosive agents

- Aspiration of gastric contents
- Pulmonary embolism
- Pulmonary infarcts
- Thoracic outlet syndrome
- Sleep apnea syndrome

## TOXICOLOGICAL DISORDERS

Principles

Toxicology information

Toxicology diagnostic modalities

Toxidromes

Treatment modalities

- Antidotes
- Skin decontamination
- Gastric decontamination
  - Emetics
  - Lavage Enhanced elimination Activated charcoal

Cathartics/ Diuresis

Dialysis

Withdrawal syndrome

Drugs and chemical classes causing toxicity

- Acetaminophen
- Alcohol
  - Ethanol
  - Ethylene glycol
  - Isopropyl alcohol
  - Methanol
- Analgesics/ Anaesthetics
- Anti cholinergics/ Cholinergics
- Anti coagulants
- Anti convulsants
- Anti depressants
  - Lithium
  - Monoamine oxidase inhibitors
  - Cyclic antidepressants
- Anti parkinsonism drugs
- Anti histamines
- Anti psychotics
- Bronchodilators
- Cannabis
- Carbon monoxide
- Cardiovascular drugs
- Caustic agents

- Cocaine
- Cyanides
- Corrosive acids
- Corrosive alkalies
- Hydrogen sulphides
- Food addictives
- Halucinogens
- Hazardous material spills
- Heavy metals and chelation
- Household / industrial poisons
- Hormones and steroids
- Hydrocarbons / Halogenated hydrocarbons
- Hypoglycemics
- Inhaled toxins
- Iron
- Isonizid
- Local anaesthetics
- Local acting drugs
- Irritant bases
- Marine toxins
- Methemoglobinemia
- Mushrooms/ poisonous plants
- Nitrogen compounds
- NSAID's
- Organophosphates
- Opioids
- Oliandar
- Rat poison
- Salicylates
- Sedatives
- Stimulants
- Strychnine
- Weed killer

### **CRITICAL CARE**

Anti microbial therapy in critical care setting  
 Catheter colonization and Catheter related bacteremia  
 Invasive and noninvasive monitoring  
 Infections after solid organ transplantation  
 Management of HIV and AIDS related infection in the ICU  
 Malaria and Other tropical infections in the ICU  
 Intra abdominal sepsis  
 Laboratory diagnosis of infections  
 Mechanical ventilation  
 Noninvasive ventilation



Acute hypoxic respiratory failure

- Pathology of Acute Lung injury
- Pathophysiology and Management of Acute Respiratory distress syndrome
- Pulmonary aspiration
- Weaning from ventilatory support in hypoxic respiratory failure

Acute ventilatory failure

- Life threatening asthma
- Acute respiratory failure in patients with COPD
- Weaning from respiratory support in airflow obstruction states

Brain death

- Definition
- Determination
- Physiological effects on donor organs

Shock and various types

Inotropic therapy in critically ill patient Sedatives and analgesics in critical care

Neuro muscular blocking drugs in patients in the ICU Critical care imaging of chest

CT and MRI of the abdomen in the Critical care patient Interventional radiology in the critical ill patient

Imaging of the central nervous system in the critical care patient Echocardiography in critical care

## **CARDIOLOGY**

### **CARDIOVASCULAR DISORDERS**

Pathophysiology

- Congenital disorders
- Acquired disorders
- Aging

Diseases of the myocardium – acquired

- Cardiac failure
- Cardiomyopathy
- Ischemic heart disease
- Endocarditis
- Valvular heart disease
- Myocarditis

Diseases of the pericardium

- Pericarditis
- Pericardial effusion/tamponade

## Diseases of the conduction system

- Dysrhythmias
  - Atrial flutter / fibrillation
  - Atrial / junctional ectopy
  - Preexcitation syndromes
  - Supraventricular tachycardia / bradycardia
  - Ventricular flutter / fibrillation
  - Ventricular tachycardia
  - Ventricular ectopy
  - QT-Interval syndrome
- Conduction blocks
  - Sinotrial block
  - Sick sinus syndrome
  - Atrioventricular blocks (1; 2; 3)
  - Bundle - branch blocks

## Diseases of the circulation

- Acute arterial , venous and lymphatic disorders

## Hypertension

- Acute hypertensive crisis
- Chronic hypertension
  - Essential
  - Secondary

## Myocardial manifestations of the systemic diseases

### Treatment modalities

- Thrombolytic therapy
- Pharmacologic agents
- Cardiac pacemakers
  - Temporary
  - Permanent

## DERMATOLOGY

### CUTANEOUS DISORDERS

#### Dermatitis

- Acne
- Atopic
- Contact
- Dyshidrotic eczema
- Exfoliative

- Lichen simplex
  - Psoriasis
  - Seborrhea
  - Photosensitivity Infections
  - Bacterial
    - Abscess
    - Cellulitis/lymphangitis
    - Erysipelas
    - Folliculitis
    - Impetigo
    - Bacterial exanthems
  - Parasitic
    - Pediculosis
    - Scabies
  - Viral
    - Aphthous ulcers
    - Herpes simplex
    - Herpes zoster
    - Molluscum contagiosum
    - Warts
    - Viral exanthems Maculopapular lesions
  - Pupura and petechiae
  - Urticaria
  - Erythema multiforme
  - Erythema nodosum Vesicular / Bullous lesions
  - Pemphigus / pemphigold
  - Scalded skin syndrome
  - Toxic epidermal necrolysis
- Cutaneous manifestations of allergic reactions  
 Cutaneous manifestations of systemic diseases

## PAEDIATRICS

### **G I Tract**

Colic, formula intolerance Foreign body Gastroenteritis

Viral / Bacterial / Parasite / Allergic / Inflammatory bowel disease Gastro oesophageal reflux

GI bleeding

- Upper
- Lower

Surgical emergencies

- Tracheo oesophageal fistula / esophageal atresia
- Pyloric stenosis

- Malrotation / volvulus
- Intussuception
- Hernia - inguinal, umbilical
- Appendicitis

Acute pancreatitis

Hepatic coma / Fulminant hepatic failure

### **Cardio Vascular**

Arrhythmia

Congenital heart disease

- Left to right shunt
- Right to left shunt with hypoxic spells
- Obstructive lesions - Pulmonary / systemic Acquired heart diseases
- Pericardial effusion / pericarditis
- Infective endocarditis
- Myocarditis
- Rheumatic fever.

Congestive cardiac failure

Hypertension

### **Endocrine / Metabolic Disorders**

Diabetes mellitus / Diabetic Ketoacidosis

Hypoglycemia

Diabetes insipidus

SIADH

Hyper and hypoparathyroidism / hypocalcemia

Hypo and hyper thyroidism

Congenital adrenal hyperplasia / crisis

Cushing's syndrome

Inborn errors of metabolism

### **Hematologic**

Anaemia - Aplastic, nutritional, hemoglobin

Thalassemia, Sickle cell anaemia, Spherocytosis

Hemostatic disorders

- ITP
- DIC
- Inherited disorders of Hypercoagulation states
- Methemoglobinemia
- Leukemias

### **Neurology**

Acute encephalopathies - including Reye's syndrome

Meningitis / Encephalitis - viral, bacterial, tuberculosis Seizures

Febrile, Non-febrile, Epilepsy Status epilepticus

Hypoxic ischaemic encephalopathy Coma  
Raised intracranial tension – hydrocephalus, pseudo tumour cerebri Acute flaccid  
paralysis  
Chorea  
Migraine CNS tumours  
Nerocysticerosis

### **Orthopedics**

Septic arthritis Osteomyelitis  
Transient synovites / reactive arthritis Tumours  
• Ewing's sarcoma

### **ENT**

Epistaxis  
Foreign body  
Naso pharyngitis  
Otitis externa  
Otitis media  
Tonsillitis  
Ludwig's angina  
Torticollis

### **R S Croup**

- ACTB
- Epiglottitis
- Spasmodic croup
- Foreign body
- Bronchiolitis
- Asthma

### **Status asthmaticus Pneumonia**

- Bacterial
- Viral
- Myoplasma
- Chlamydial
- Tuberculosis Aspiration pneumonia Pulmonary edema

Pleural effusion / emphysema Pneumothorax

Congenital abnormalities in respiratory tract Congenital diaphragmatic hernia

Apnea / Respiratory failure / Respiratory distress ARDS

Acute psychiatric problems in children

## **Infection**

Diphtheria  
Tetanus  
Pertussis  
Viral hemorrhagic fever / dengue  
Poliomyelitis  
Staphylococcus infection  
Meningococcus  
Hemophilus influenza  
Pneumococcus  
Rabies  
Herpes simplex  
Cholera  
Food poisoning  
Bacteremia / septicemia  
Viral exanthematous fevers  
Immunization  
Fever without localizing signs

## **Rheumatology**

Juvenile Rheumatoid arthritis  
Henoch-schonlein purpura / vasculitis  
Kwasaki syndrome  
SLE

## **Skin**

Cellulitis / Impetigo  
Urticaria / angioedema

## **Renal / genitourinary**

Congenital abnormalities of kidney  
Urinary tract infection - uncomplicated  
Complicated Acute glomerulonephritis  
Nephrotic syndrome Urolithiasis  
Renal tubular acidosis Acute renal failure

- Chronic renal failure Hemolytic uremic syndrome Penis
- Balanitis
- Phimosis / paraphimosis Testis
- Torsion

Undescended Testis

## **New born**

Resuscitation Transport  
Assessment - gestational age, sick new born Preterm / IUGR  
Jaundice

Sepsis – local, general Seizures

Birth asphyxia Birth trauma Bleeding neonate

Temperature regulation and hypothermia Hyaline membrane disease

### **Fluid and electrolytes**

General principles including type of fluid, composition, daily requirements Fluids in special situation including newborn

Specific disturbance

- Hyponatremia
- Hypernatremia
- Hypokalemia
- Hyperkalemia
- Disorders of calcium/magnesium Acid base balance

### **Critical care / problems**

BLS, PALS in children

Airway management

Rapid sequence intubation

Post intubation

Assisted ventilation

Pre hospital care

Transport of sick child

Post resuscitation stabilization Shock

Anaphylaxis

Temperature regulation

Component transfusion

Infection control

Vascular access

Drugs

### **Drug therapy in neonate and children**

#### **Poisoning and animal bites**

General principles of management

Salicylate poisoning

Acetaminophen poisoning

OPC, Organochlorines

Hydrocarbons

Acids / alkali

Oleander, Datura

Dapsone, anti convulsants, anti histamine, iron

Scorpion sting

Snake bite

**Environment**

Electrical injuries  
CO poisoning / smoke injuries  
Near drowning / drowning  
Heat stroke

**Burns****Paediatric trauma**

Epidemiology of child hood injuries  
Setting up of regional pediatric trauma centre  
Trauma score  
Thoracic injuries  
Abdominal trauma  
Genitourinary trauma

Evaluation of hand, soft tissue injuries,  
Envenomation injuries  
Musculoskeletal trauma  
CNS injuries  
Spinal injuries  
Vascular injuries

**Child abuse - physical, sexual****Emergency procedures**

Passing NG tube  
Catheterization  
ICT drainage, pleural tap  
Umbilical vein cannulation  
Ascitic tap  
Pericardial tap

**OBSTETRICS & GYNAECOLOGY****OBSTETRICS AND DISORDERS OF PREGNANCY**

Pregnancy, Uncomplicated  
Pregnancy, complicated

- Ectopic
- Hyperemesis gravidarum
- Abortion
  - Threatened
  - Inevitable
  - Incomplete
  - Complete



- Septic
- Missed
- Abruptio placenta
- Placenta praevia
- Toxemia / pregnancy induced hypertension
  - Pre-eclampsia
  - Eclampsia
- Rh Incompatibility
- Hydatiform mole
- Underlying illness
- Labor uncomplicated
- Labor complicated
  - Premature rupture of membranes
  - Preterm labor
  - Failure to progress
  - Fetal distress
  - Ruptured uterus
- Delivery, uncomplicated
  - Presentation
  - Position
  - Lie
- Episiotomy Delivery complicated
  - Presentation
  - Dystocia
  - Prolapsed cord
  - Retained placenta
  - Uterine inversion
  - Multiple births
  - Still birth
- Emergency cesarean section Post partum complication
  - Retained products of conception
  - Hemorrhage
  - Endometritis
  - Mastitis

### **When Pregnancy is suspected**

- Bleeding in pregnancy - SHOCK Retained placenta
- Abdominal pain during pregnancy
- Vomiting in pregnancy
- Seizures in pregnancy
- Headache and fever in pregnancy/ puerperal
- Injury to a pregnant woman (RTA)
- Recognition of risk factors in pregnancy
- Septic shock (CPR in Pregnancy)

## GENERAL SURGERY

### ABDOMINAL AND GASTROINTESTINAL DISORDERS

#### Oesophagus

Motor abnormalities

- Rupture
- Perforation (Boerhaave's syndrome)
- Tears (Mallory - Weiss syndrome)
- Hematoma
- Foreign body
- Diaphragmatic hernia
- Diverticula
- Caustic injury
- Herpetic esophagitis
- Acute amoebic hepatitis

#### Liver

- Hepatitis
  - Viral
  - Bacterial
  - Parasitic
  - Drug and toxin
- Alcoholic
- Prophylaxis
- Cirrhosis
  - Alcoholic
  - Viral
  - Biliary obstructive
  - Drug-induced
  - Toxin-induced
- Hepatic hepatorenal failure
- Abscess
  - Primary abscess
  - Metastatic abscess
- Hydatid liver
- Portal hypertension

#### Gall bladder and biliary tract

- Cholecystitis
- Cholangitis
- Cholelithiasis and choledocholithiasis
- Gallstone ileus
- Tumours

- Inflammatory disorders
- Gall stones

### **Pancreas**

#### Inflammatory disorders

- Acute pancreatitis
- Chronic pancreatitis
- Pseudocyst/abcess
- Pancreatic insufficiency Tumours
- Islet cell tumors
- Carcinoma

### **Stomach**

#### Structural lesions

- Volvulus
- Foreign bodies
- Rupture
- Gastric outlet obstruction Inflammatory disorders
- Acute gastritis
  - Stress-related
  - Corrosive gastritis
  - Drug induced Peptic ulcer disease
- Duodenal ulcer
- Gastric ulcer
- Acute gastrointestinal hemorrhage Tumours

### **Small bowel**

#### Motor abnormalities

- Obstruction
  - Mechanical
  - Adynamic
- Pseudoobstruction Structural disorders
- Aortoenteric fistula
- Malabsorption
- Meckel's diverticulum Inflammatory disorders
- Acute appendicitis
- Regional enteritis/crohn's disease Infectious disorders
- Viral
- Bacterial
- Parasitic

#### Tumours

#### Vascular disorders

- Mesenteric ischemia
- Ischemic colitis

## **Large bowel**

### Motor abnormalities

- Irritable bowel
  - Constipation
  - Aganglionic megacolon/Hirschsprung's
  - Obstruction / pseudo obstruction
- ### Structural disorders
- Diverticular disease
  - Volvulus
  - Vascular dysplasia (angiodyplasia)
- ### Inflammatory disorders
- Ulcerative colitis
  - Radiation colitis

### Infectious disorders

- Bacterial
- Viral
- Parasitic
- Antibiotic-associated Tumors

## **Rectum and Anus**

### Structural disorders

- Anal fissure
  - Anal hematoma
  - Anorectal fistula
  - Hemorrhoids
    - Internal
    - External
  - Rectal prolapse
  - Foreign body
  - Perirectal abscess
  - Perianal / pilonidal abscess
- ### Inflammatory disorders
- Proctitis
  - Perianal hematoma

## **Abdominal wall**

### Hernias

### **Peritoneum**

### Ascites

### Peritonitis

### Breast

### Inguinal hernia

### Hydrocele

### Testis

### Oesophago gastroscopy

## PLASTIC & RECONSTRUCTIVE MICRO SURGERY

### LECTURES

Wound healing

Wound care and dressings

Suturing

Skin grafting

Hand injury

- History and examination
- First AID
- Emergency room management
- Definitive treatment

### Burns

Types / classification / medicolegal aspects

Assessment of depth / % surface area and management of shock respiratory burns and complication First AID at site

Management - initial at emergency room Management subsequently

Other types of burns - Electrical, Chemical and Radiation

### Microsurgical emergency

Limbs / digits with vascular compromise

Amputation

Preservation of amputated part and care of stump

Do's and Don't's

### Degloving injuries of limbs

### Management and counselling in plastic surgical birth anomalies

Life threatening

Non life threatening

### Management of hand infection

### Basic Surgical Skills

- Suturing with fine suture 6.0 - 4.0 size
- I & D in hand infection
- I & D in facial abscesses
- Hand injury: debridement, repair, splinting
- Emergency escharotomy in burns

## OPHTHALMOLOGY

### Eye

Foreign body chemical in eyes

- External eye
- Anterior pole
- Posterior pole
- Orbit

Cavernous sinus thrombosis

Basic techniques of ophthalmic examination

- Orbit
- Adnexa
- Ocular motility
- Anterior segment
- Pupillary examination
- Posterior segment
- Orbital trauma
- Adnexal trauma
- Anterior segment trauma
- Optic nerve trauma

## PROCEDURE/SKILLS

- Bedside ophthalmic examination
- Direct ophthalmoscopy
  
- Eye patching, use of protective eye shield
- Taping of lids to prevent exposure
- Temporary tarsorrhaphy
- Eyelid laceration repair

## OTO-RHINO-LARYNGOLOGY

### EAR

Cellulitis / abscess of external ear

Foreign body

Labrynthitis

Malignant otitis externa

Mastoiditis

Otitis externa

Otitis media

Tympanic membrane perforation

Acute inflammation of ear

- Furuncle
- Otomycosis

Emergency management of Foreign bodies of external and middle ear

- Diagnosis and management

Trauma to external ear

- Haematoma auris
- Trauma to external auditory canal
- Fracture of temporal bone Trauma to tympanic membrane
- Traumatic perforation
- Blast injuries
- Fracture of skull base Neoplasam of external ear
- Impacted cerumen of external ear - diagnosis and management Inflammation of middle ear
- Acute ottits media with effusion
- Chronic ottits media - acute manifestations
- Complications of ottits media inter cranial and extra cranial
- Diabetic ottits media
- Fracture of temporal bone - classification, mechanism, diagnosis and management
- Management of acute vertigo - etiology, diagnosis and management
- Benign paroxismal, positional vertigo
- Labrinthits - viral, bacterial
- Noise induced hearing loss - blast injuries

## NOSE

Epistaxis

Nasal foreign body Rhinitis

Sinusitis

Anatomy of nose and para nasal sinosis Basic physiology

Epistaxis etio - pathology clinical features and management Vestbulitis - anterior rhinitis sinusitits

Fracture nasal bone

Tumours of nose, paranasal sinosis and nasopharynx, benign and malignant tumours of CFS Rhinorrhea

Fracture maxilla (le forts) Proptosis

Choanal atresia

## OROPHARYNX / THROAT

Foreign body

Gingivitis

Laryngitis

Ludwigs angina

Oral candidiasis

Pericondriitis

Periodental abscess

Tonsilitis / Peritonsilar abscess

Pharyngitis

Retropharyngeal abscess  
Stomatitis  
Temporomandibular joint disorders  
Uvulitis

#### Diseases of oral cavity & pharynx

- Stomatitis
- Ludwig's angina
- Tumours of oral cavity
- Ranula
- Haemangioma
- Lymphangioma
- Leucoplakia Tonsillitis & adenoiditis
- Acute
- Chronic Peritonsillar abscess

#### Acute & chronic pharyngitis

- Retropharyngeal abscess/parapharyngeal abscess
- Foreign bodies in pharynx
- Globus hystericus
- Sleep-apnoea syndrome
- Chemical trauma to pharynx
- Tumours of pharynx
- Temporomandibular joint dislocation
- Oesophagus
  - Anatomy & physiology of oesophagus
  - Oesophagitis
  - Foreign bodies of oesophagus
  - Dysphagia
  - Achalasia cardia
  - Malignant disease of oesophagus

## LARYNX

Anatomy of larynx

Physiology of larynx

Injuries of larynx (open & closed) Laryngo-tracheal stenosis

Acute laryngitis, epiglottitis, laryngo tracheo bronchitis Foreign bodies in the larynx  
(diagnosis & management) Benign & malignant tumours of larynx

Vocal cord paralysis Airway obstruction (stridor)



## **TRACHEA & BRONCHI**

Anatomy of trachea & bronchi Acute laryngo-tracheo-bronchitis  
Foreign bodies in the air & food passage  
(diagnosis & management) Neoplasms of trachea & bronchi Tracheostom

## **HEAD & NECK**

Anatomy of neck  
Benign tumors of neck  
Thyroid tumors  
Parapharyngeal space tumors & infection  
Fracture cervical spine  
Fracture skull base  
Fascial spaces of the neck  
Facial palsy

### **Special Situations**

Injection Drug Users  
The elder patient  
Adults with Physical Disabilities  
The Mentally Retarded Adult  
The Homeless Patient  
The Morbidly Obese Patient  
Patient Safety in Emergency Medicine  
Medico legal aspects of emergencies

## **PROCEDURES/ SKILLS**

### **Airway techniques**

Patent Airway Maintenance.....Jaw Thrust, Chin Lift

Use of Airways---Nasal , Oral

Cricothyrotomy Tracheostomy

Heimlechs maneuver

Intubation

- Esophageal obturator airway, LMA Insertion , I Gel
- Nasotracheal
- Oratracheal
- Rapid sequence intubation
- Fiber optic Mechanical ventilation
- Transport Ventilation
- Use of Ambu Bag and Bain Circuit

Percutaneous transtracheal ventilation Airway adjuncts Jet Ventilation

Local

Regional

Intravenous anaesthesia

Regional nerve blocks

General anaesthesia

Diagnostic procedures

Arthrocentesis, Cystourethrogram, Lumbar puncture, Nasogastric intubation  
Pericardiocentesis, Peritoneal lavage,

Bed side USG

F.A.S.T and E- F.A.S.T

Anoscopy

Thoracocentesis Tonometry

Fundal Examination

Slit lamp examination, ECG interpretation, Radiographic interpretation

Central venous line placement, Chest tube placement

**Genital / Urinary**

Bladder catheterization

Suprapubic catheterisation

Delivery of new born

**Head and neck**

Control of epistaxis

Laryngoscopy

Naso / Pharyngeal endoscopy

**Hemodynamic techniques**

Arterial catheter insertion

Central venous access

- Femoral
- Jugular
- Subclavian
- Umbilical
- Venous cut down
- Intraosseous infusion

Military anti shock trouser suit application and removal Peripheral venous cut  
down Pulmonary artery catheter insertion

## **Skeletal procedures**

Fracture dislocation immobilization techniques

Fracture dislocation reduction techniques

## **Spine**

- Cervical traction techniques
- Immobilization techniques (manual inline stabilization)
- Back board techniques
- MILS

## **Thoracic**

Cardiac pacing

- Cutaneous
- Transvenous

Defibrillation

Cardioversion

Pericardiotomy

Thorocostomy

Intra aortic balloon insertion

## **Other techniques**

End tidal CO<sub>2</sub> Monitoring Gastric lavage

Incision and drainage Intestinal tube insertion Burr holes

Pulse oximetry

Sengstaken blakemore insertion technique Wound closure techniques

Traphanisation - Nails

Peak expiratory flow rate measurement Excision of thrombosed hemorrhoids Foreign body removal

Conscious sedation Wound debridement

## **Laboratory skills**

Venepuncture

Arterial blood gas sampling

Microscopy

Gram stain

Preparation / interpretation

Use of point of care lab instruments

## **Multiple patient management**

### **Universal precautions**

### **ACLS**

### **Pericardio centesis**

### **Intraosseous needle**

## **V. RECOMMENDED BOOKS AND JOURNALS**

### **(a) Books:**

1. Emergency Medicine – A comprehensive Study Guide – VII Edition. – Judith Tintinalli
2. Text Book of Emergency Medicine, Chief Editor - Dr Suresh David , Ist edition 2012
3. Emergency Medicine – Concept and Clinical Practice –VII Edition, Rosen Barkin
4. Principle and Practice of Emergency Medicine – George Schwartz - IV Edition
5. Emergency Medicine – Hamilton
6. Essential of Immediate Medical Care, II Edition – Dr. C. John Eaton
7. Clinical Management of Drug Overdose and Poisoning, - Haddad, Shannon, Winchester
8. Emergency Department Management Principles and Application - Richard F Salluzzo
9. The Five Minute Emergency Medicine Consult - Rosen Barkin – III Edison
10. Disaster Medicine - David E Hugan
11. Text Book of Paediatric Emergency Medicine – Fleisher – XVII Edition
12. Medical Emergencies In Children - Meherban Singh
13. Drugs Therapy in Emergency Medicine - Joseph P. Ornato/Edgar R. Gonzalez
14. Hamilton Bailey's 1995 - Emergency Surgery - BW Ellis, 12<sup>th</sup> edition.
15. Davidson's Principles and Practices of Medicine
16. Clinical Medicine - Kumar & Clark
17. Harrisons Principles of Internal Medicine
18. Text Book of Critical Care – V Edition – Shoe maker
19. Gold frank's Toxicologic Emergencies – V Edition
20. Pediatric Emergency Medicine: A Comprehensive Study Guide by Gary R. Strange, William R. Ahrens, Steven Lelyveld, William Ahrens- McGraw-Hill Professional; 1st edition (August 1, 1995)
21. Emergencies in Obstetrics and Gynaecology (Oxford Handbooks in Emergency Medicine, Vol 8) by Lindsey Stevens, Anthony Kenney- Oxford University Press; (July 1, 1994)
22. Principles of Critical Care by Jesse B. Hall, Gregory A. Schmidt, Lawrence D. H. Wood- McGraw-Hill Professional Publishing; 2nd edition (January 1, 1998)

23. Critical Care by Joseph M. Civetta, Robert W. Taylor, Robert R. Kirby- Lippincott Williams & Wilkins; 3rd edition (January 15, 1997)
24. Emergency Medicine: Topics and Problems for Students by Jelinek- Blackwell Science Ltd; (September 28, 1999)
25. Accidents and Emergencies in Children (Oxford Handbooks in Emergency Medicine)
26. Acute Medical Emergencies by Ursula Guly, Drew Richardson- Oxford University Press; 3<sup>rd</sup> edition (January 15, 1996)
27. Outline of Fractures (Churchill Livingstone), 12<sup>th</sup> Edition, John Crawford Adams, David L. Hamblen
28. Outline of Orthopedics (Churchill Livingstone), 14<sup>th</sup> Edition, John Crawford Adams, David L. Hamblen.

**(b) Journals**

1. Emergency Medical Journal BMJ
2. Canadian journal of emergency medicine
3. Annals of Emergency Medicine
4. Paediatric Emergency Medicine journals
5. Journal of Accident and Emergency Medicine
6. The American journal of Emergency Medicine

## Postgraduate Students Appraisal Form

## Pre / Para /Clinical Disciplines

\*\*\*

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sl. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based/recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis/Research work										
7.	Log Book Maintenance										

Publications

Yes/No

Remarks\*

\_\_\_\_\_

\_\_\_\_\_

**\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGN.OF ASSESSEE

SIGN.OF FACULTY I/C

SIGN.OF HOD

Annexure II

# PLAGIARISM

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI  
(A University established by an Act of A.P. State Legislature)

## GUIDELINES FOR 'PLAGIARISM' CHECK WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D students

**Ref.: Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for ThefRses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

### **1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

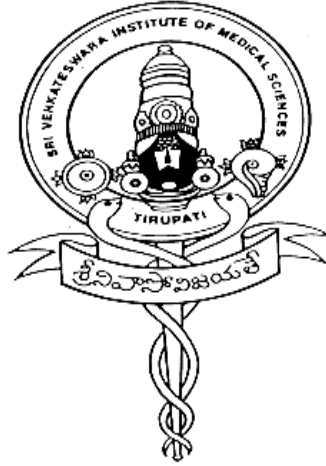
They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,

(A University established by an Act of Andhra Pradesh Legislature)

TIRUPATI - 517 507



LOG BOOK

COMMON FOR MD/ MS/ DM/ M.Ch. POSTGRADUATES

Name of the Candidate .....

Subject / Course .....

Admn. No. ....



## PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :

*(Preferably be done by the faculty with whom the resident worked for most part of the period)*

Quality being Assessed

1. Patient Evaluation
2. Academic Knowledge About Patients Problems
3. Curiosity about unexplained Observations
4. Patient Care
5. Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

*Signature of the candidate*

*Signature of the guide    Signature of the HoD with seal*

### DETAILS OF POSTINGS OVER 3 YEARS

**1st YEAR**

**From..... To.....**

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

*Signature of Faculty :*

**2nd YEAR From..... To.....**

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

3rd YEAR From..... To.....

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

*Signature of Faculty :*

**Thesis Topic:**

**Guide:**

**Co-Guides :**

### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

## JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Journal Review Presentations

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material , Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyse the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**CASES PRESENTED IN MORTALITY CONFERENCE**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LAB / INVASIVE PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>

### CONFERENCES ATTENDED

S. No.	Name	Role	Signature of supervising Faculty

### PUBLICATIONS

S. No.	Topic	Journal	Role

### BEDSIDE CASE DISCUSSION

S. No.	Date	Diagnosis	Signature of Faculty Presented to

## SUMMARY OF LOG BOOK

(To be filled at the end of the course & retained in this book)

Name of the student : Admn.No.

Name of the Course : From\_\_\_\_\_ To\_\_\_\_\_

Name of the Institute:

- |  |   |                |
|--|---|----------------|
| 1) No. of Journal Review Presentations   | : Presented .....                         | Attended ..... |
| 2) No. of Seminar Presentations  | : Presented .....                         | Attended ..... |
| 3) No. of Clinical Presentations   | : Presented .....                         | Attended ..... |
| 4) No. of Case Presentations   | : Presented .....                         | Attended ..... |
| 5) No. of UG Teaching Programms<br>(Theory class / Clinics / Practicals /<br>Demonstrations / Tutorials) | : Conducted .....                         | Attended ..... |
| 6) No. of PG Teaching Programmes   | : Attended                                |                |
| 7) No. of Investigative Procedures   | : Performed .....Assisted.....Observed... |                |
| 8) No. of Major Operations /<br>Procedures /<br>Experiments  | : Performed .....Assisted.....Observed... |                |
| 9) No. of Minor Operations /<br>Procedures /<br>Experiments  | : Performed .....Assisted.....Observed... |                |
| 10) No. of Emergencies   | : Performed .....Assisted.....Observed... |                |
| 11) No. of Medicolegal work  | : Performed .....Assisted.....Observed... |                |
| 12) No. of Public Health Visit /<br>Social work /<br>Survey /<br>Immunization /<br>Camps                 |   |                |
| 13) No. of Clinico Pathological Conference:  | Presented .....                           | Attended ..... |
| 14) No.of special investigation /<br>Procedure   | : Conducted .....                         | Attended ..... |
| 15) No. of events attended   | Conferences..... Symposia .....           |                |
|  | Workshops ..... CME .....                 |                |
| 16) Any other activities   | :   |                |

*Signature of the candidate*

*Signature of the guide*

*Signature of the HoD with seal*

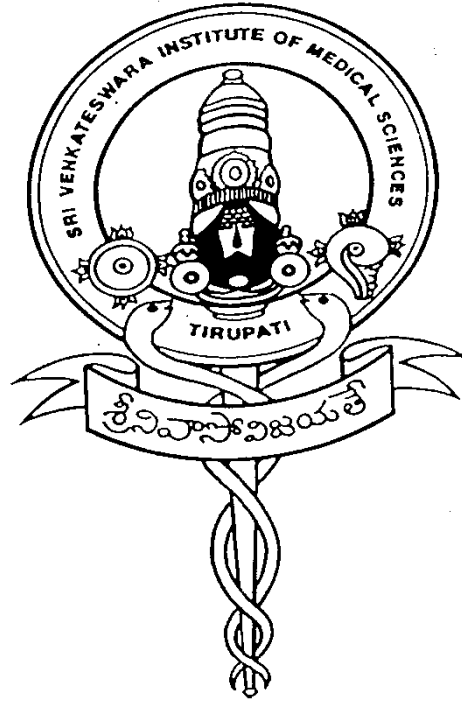
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**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI – 517 507**



**M.S. - GENERAL SURGERY**

**COMMON BOARD OF STUDIES MEETING  
ON 22.07.2021**

---

**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUAPATI**

**M.S. (GENERAL SURGERY)**

**MD/MS COMMON BOARD OF STUDIES MEETING HELD ON 22.07.2021**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**

**M.S. (GENERAL SURGERY)**

**MD/MS COMMON BOARD OF STUDIES MEETING  
HELD ON 22.07.2021**

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## GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN GENERAL SURGERY

### I. PREAMBLE:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A post graduate specialist having undergone the required training should be able to recognize the health needs of the community should be competent to handle effectively medical / surgical problems and should be aware of the recent advances pertaining to his specialty. The PG student should be competent to provide professional services with empathy and humane approach. The PG student should acquire the basic skills in teaching of medical / para-medical students and is also expected to know the principles of research methodology and self-directed learning for continuous professional development.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

### II. REGULATIONS:

- a) **Eligibility for admission:** A candidate seeking admission into the course shall have MCI / NMC recognized MBBS qualification.
- b) **Admission:** In order to be **eligible** for admission to any postgraduate course in a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in '**National Eligibility-cum- Entrance Test for Postgraduate courses**' held for the said academic year.
- c) **Duration of the course:** The duration of the course shall be three calendar years (including the period of examination).
- d) **Bond:**
  - i) The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/- value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. **5,00,000/- (Rupees Five Lakhs only)** along with the full stipend amount received by him/her back to the Institute.
  - ii) The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful

completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.20,00,000 (Rupees Twenty lakhs only).

- e) **Training Programme:** The candidate joining the course must work as full time Resident during the period of Post Graduate Training.

*Note: In-Service candidate will not be paid stipend if He / She draws leave salary in that parent institution.*

- f) **External training:** The residents are permitted for external posting during the training period on payment of stipend for a period not exceeding one month as per the need and on recommendation of the HoD. The request for such training shall be submitted to the Dean, SVIMS through proper channel, two months in advance in order to process with the institution where the posting is required. The expenditure towards travel, accommodation and fees shall be borne by the individual.

#### g) **Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

- h) **Attendance:** All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

### **i) District Residency Programme (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as “**District Residency Programme (DRP)**” and the postgraduate medical student undergoing training shall be termed as a “**District Resident**”.

### **III. SUBJECT SPECIFIC LEARNING OBJECTIVES:**

#### **Clinical Objectives**

At the end of postgraduate training, the PG student should be able to;

1. Diagnose and appropriately manage common surgical ailments in a given situation.
2. Provide adequate preoperative, post-operative and follow-up care of surgical patients.
3. Identify situations calling for urgent or early surgical intervention and refer at the optimum time to the appropriate centers.
4. Counsel and guide patients and relatives regarding need, implications and problems of surgery in the individual patient.
5. Provide and coordinate emergency resuscitative measures in acute surgical situations including trauma.
6. Organize and conduct relief measures in situations of mass disaster including triage.
7. Effectively participate in the National Health Programs especially in the Family Welfare Programs.
8. Discharge effectively medico-legal and ethical responsibilities and practice his specialty ethically.
9. Must learn to minimize medical errors.
10. Must update knowledge in recent advances and newer techniques in the management of the patients.
11. Must learn to obtain informed consent prior to performance of operative procedure.
12. Perform surgical audit on a regular basis and maintain records (manual and/or electronic) for life.
13. Participate regularly in departmental academic activities by presenting Seminar, Case discussion, Journal Club and Topic discussion on weekly basis and maintain logbook.
14. Demonstrate sufficient understanding of basic sciences related to his specialty.
15. Plan and advise measures for the prevention and rehabilitation of patients belonging to his specialty.

**Research:**

The student should:

1. Know the basic concepts of research methodology, plan a research project and know how to consult library.
2. should have basic knowledge of statistics.

**Teaching:**

The student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students.

**Professionalism:**

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.

**IV. SUBJECT SPECIFIC COMPETENCIES:**

**By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:**

**A. Cognitive domain**

- Demonstrate knowledge of applied aspects of basic sciences like applied anatomy, physiology, biochemistry, pathology, microbiology and pharmacology.
- Demonstrate knowledge of the bedside procedures and latest diagnostics and therapeutics available.
- Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.
- Demonstrate the theoretical knowledge of general principles of surgery.
- Demonstrate the theoretical knowledge of systemic surgery including disaster management and recent advances.
- Demonstrate the theoretical knowledge to choose, and interpret appropriate diagnostic and therapeutic imaging including ultrasound, Mammogram, CT scan, MRI.
- Demonstrate the knowledge of ethics, medico-legal aspects, communication skills and leadership skills. The PG student should be able to provide professional services with empathy and humane approach.

## **B. Affective domain**

- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- Develop communication skills to word reports, obtain a proper relevant history and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.
- Obtain informed consent for any examination/procedure and explain to the patient and attendants the disease and its prognosis with a humane approach.
- Provide appropriate care that is ethical, compassionate, responsive and cost effective and in conformation with statutory rules.

## **C. Psychomotor domain**

- Perform a humane and thorough clinical examination including internal examinations and examinations of all organs/systems in adults and children
- Write a complete case record with all necessary details.
- Arrive at a logical working diagnosis / differential diagnosis after clinical examination.
- Order appropriate investigations keeping in mind their relevance (need based).
- Choose, perform and interpret appropriate imaging in trauma - ultrasound FAST (Focused Abdominal Sonography in Trauma).
- Perform minor operative procedures and common general surgical operations independently and the major procedures under guidance.
- Provide basic and advanced life saving support services in emergency situations
- Provide required immediate treatment and comprehensive treatment taking the help of specialist as required.
- Perform minimally invasive surgery in appropriate clinical settings. Must have undergone basic training in operative laparoscopy related to general and GI Surgery.
- Undertake complete patient monitoring including the preoperative and post operative care of the patient.
- Write a proper discharge summary with all relevant information.



## **V. SYLLABUS:**

### **Course Contents:**

No limit can be fixed and no fixed number of topics can be prescribed as course contents. She/he is expected to know the subject in depth, however, emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competence in surgical skills commensurate with the specialty (actual hands - on training) must be ensured.

### **1. General topics:**

A student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to his specialty. Further, the student should acquire in-depth knowledge of his subject including recent advances and should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.

1. History of medicine with special reference to ancient Indian texts
2. Health economics - basic terms, health insurance
3. Medical sociology, doctor-patient relationship, family adjustments in disease, organizational behavior, conflict resolution
4. Computers - record keeping, computer aided learning, virtual reality, robotics
5. Hazards in hospital and protection:  
AIDS, hepatitis B, tuberculosis, radiation, psychological
6. Environment protection - bio-medical waste management
7. Surgical audit, evidence based surgical practice, quality assurance
8. Concept of essential drugs and rational use of drugs
9. Procurement of stores and material & personal management
10. Research methodology - library consultation, formulating research, selection of topic, writing thesis protocol, preparation of consent form from patients
11. Bio-medical statistics, clinical trials
12. Medical ethics
13. Consumer protection
14. Newer antibiotics
15. Problem of resistance.
16. Sepsis - SIRS
17. Nosocomial infection
18. Advances in imaging technologies
19. Disaster management, mass casualties, Triage
20. O.T. design, technologies, equipment

21. Critical care in surgical practice
22. Response to trauma
23. Wound healing
24. Fluid and electrolyte balance
25. Nutrition
26. Blood transfusion
27. Brain death
28. Cadaveric organ retrieval

## 2. Systemic Surgery

The student must acquire knowledge in the following important topics are but teaching should not be limited to these topics. A standard text-book may be followed, which will also identify the level of learning expected of the trainees.

- Wound healing including recent advances
- Asepsis, antisepsis, sterilization and universal precaution
- Surgical knots, sutures, drains, bandages and splints
- Surgical infections, causes of infections, prevention
- Common aerobic and anaerobic organisms and newer organisms causing infection including *Helicobacter Pylori*
- Tetanus, gas gangrene treatment & prevention
- Chronic specific infections TB, Filariasis
- Boils, cellulites, abscess, narcotizing fasciitis and synergistic infection
- Antibiotic therapy rationale including antibiotic prophylaxis, misuse, abuse
- Hospital acquired nosocomial infection causes and prevention including MRSA etc.
- HIV, AIDS and Hepatitis B & C, Universal precautions when dealing with patients suffering from these diseases
- Fluid and electrolyte balance including acid - base disturbance, consequences, Interpretation of blood gas analysis data and management
- Rhabdomyolysis and prevention of renal failure
- Shock (septicaemic, hypovolaemic, Neurogenic, anaphylactic), etiology, pathophysiology and management
- Blood and blood components, transfusion indication, contraindication, mismatch and prevention and management of complications of massive blood transfusion
- Common preoperative preparation (detailed preoperative workup, risk assessment according to the disease and general condition of the patient as per ASA grade) and detailed postoperative complications following major and minor surgical procedures

- Surgical aspects of diabetes mellitus particularly management of diabetic foot and gangrene, preoperative control of diabetes, consequences of hypo- and hyper- glycaemia in a postoperative setting
- Consequences and management of bites and stings including snake, dog, human bites
- Mechanisms and management of missile, blast and gunshot injuries
- Organ transplantation: Basic principles including cadaver donation, related Human Organ Transplant Acts, ethical and medicolegal aspects.
- Nutritional support to surgical patients
- Common skin and subcutaneous condition
- Sinus and fistulae, pressure sores
- Acute arterial occlusion, diagnosis and initiate management
- Types of gangrene, Burger's disease and atherosclerosis
- Investigations in case of arterial obstruction, amputation, vascular injuries: basic principles and management
- Venous disorders: Varicose veins
- Diagnosis, principles of therapy, prevention of DVT: basic principles and management
- Lymphatic: Diagnosis and principles of management of lymphangitis and lymphedema
- Surgical management of Filariasis
- Burns: causes, prevention and management
- Wounds of scalp and its management
- Recognition, diagnosis and monitoring of patients with head injury, Glasgow coma scale
- Undergo advanced trauma and cardiac support course (certified) before appearing in final examination
- Recognition of acute cerebral compression, indication for referrals.
- Cleft lip and palate
- Leukoplakia, retention cysts, ulcers of tongue
- Oral malignancies
- Salivary gland neoplasms
- Branchial cyst, cystic hygroma
- Cervical lymphadenitis nonspecific and tuberculous, metastatic lymph nodes and lymphomas.
- Diagnosis and principles of management of goitre
- Thyroglossal cyst and fistula
- Thyrotoxicosis
- Thyroid neoplasms
- Management of solitary thyroid nodule

- Thoracic outlet syndrome
- Management of nipple discharge
- Breast abscess
- Clinical breast examination, breast self examination
- Screening and investigation of breast lump
- Concept of Single Stop Breast Clinic
- Cancer breast diagnosis, staging and multimodality management (common neoadjuvant and adjuvant and palliative chemotherapy protocols and indications of radiation and hormonal therapy, pathology and interpretation of Tumour Markers, breast cancer support groups and counseling)
- Recognition and treatment of pneumothorax, haemothorax
- Pulmonary embolism: Index of suspicion, prevention/recognition and treatment
- Flail chest, stove in chest
- Postoperative pulmonary complication
- Empyema thoracis
- Recognition of oesophageal atresia and principles of management
- Neoplasms of the lung including its prevention by tobacco control
- Cancer oesophagus: principles of management including importance of early detection and timely referral to specialist
- Achalasia cardia
- Gastro-oesophageal reflux disease (GERD)
- Congenital hypertrophic pyloric stenosis
- Aetiopathogenesis, diagnosis and management of peptic ulcer including role of H. Pylori and its diagnosis and eradication
- Cancer stomach
- Signs and tests of liver dysfunction
- Amoebic liver abscess and its non-operative management
- Hydatid cyst and its medical and surgical management including laparoscopic management
- Portal hypertension, index of suspicion, symptoms and signs of liver failure and timely referral to a specialist center
- Obstructive jaundice with emphasis on differentiating medical vs surgical Jaundice, algorithm of investigation, diagnosis and surgical treatment options
- Neoplasms of liver
- Rupture spleen
- Indications for splenectomy
- Clinical features, diagnosis, complications and principles of management of cholelithiasis and cholecystitis including laparoscopic cholecystectomy

- Management of bile duct stones including endoscopic, open and laparoscopic management
- Carcinoma gall bladder, incidental cancer gallbladder, index of suspicion and its staging and principles of management
- Choledochal cyst
- Acute pancreatitis both due to gallstones and alcohol
- Chronic pancreatitis
- Carcinoma pancreas
- Peritonitis: causes, recognition, diagnosis, complications and principles of management with knowledge of typhoid perforation, tuberculous peritonitis, postoperative peritonitis
- Abdominal pain types and causes with emphasis on diagnosing early intra-abdominal acute pathology requiring surgical intervention
- Intestinal amoebiasis and other worms manifestation (Ascariasis) and their surgical complications (Intestinal Obstruction, perforation, gastrointestinal bleeding, involvement of biliary tract)
- Abdominal tuberculosis both peritoneal and intestinal
- Intestinal obstruction
- **Appendix:** Diagnosis and management of acute appendicitis
- Appendicular lump and abscess

### **Colon**

- Congenital disorders, Congenital mega colon
- Colitis infective / non infective
- Inflammatory bowel diseases
- Premalignant conditions of large bowel
- Ulcerative colitis
- Carcinoma colon
- Principles of management of types of colostomy

### **Rectum and Anal Canal:**

- Congenital disorders, Anorectal anomalies
- Prolapse of rectum
- Carcinoma rectum
- Anal Canal: surgical anatomy, features and management of fissures, fistula - in - ano.
- Perianal and ischiorectal abscess
- Haemorrhoids - Non-operative outpatient procedures for the control of bleeding (Banding, cryotherapy, injection) operative options - open and closed haemorrhoidectomy and stapled haemorrhoidectomy

- Anal carcinoma
- Clinical features, diagnosis, complication and principles of management of inguinal hernia including laparoscopic repair
- Umbilical, femoral hernia and epigastric hernia
- Open and Laparoscopic repair of incisional/primary ventral hernia
- Urinary symptoms and investigations of urinary tract
- Diagnosis and principles of management of urolithiasis
- Lower Urinary tract symptoms or prostatism
- Benign prostatic hyperplasia; diagnosis and management
- Genital tuberculosis in male
- Phimosi and paraphimosi
- Carcinoma penis
- Diagnosis and principles of treatment of undescended testis
- Torsion testis
- Hydrocele, haematocele and pyocele Varicocele: Diagnosis (Medical Board for fitness)
- Varicocele: Diagnosis (Medical Board for fitness)
- Acute and chronic epididymo-orchitis
- Testicular tumours
- Principles of management of urethral injuries
- Management of soft tissue sarcoma
- Prosthetic materials used in surgical practice
- Telemedicine, teleproctoring and e-learning
- Communication skills

## **VI. BIOSTATISTICS, RESEARCH METHODOLOGY & EPIDEMIOLOGY:**

1. Introduction to health research
2. Formulating research question
3. Literature review
4. Measures of disease frequency
5. Descriptive study designs
6. Analytical study designs
7. Experimental study designs: Clinical trials
8. Validity of epidemiological studies
9. Qualitative research methods: An overview
10. Measurement of study variables
11. Sampling methods
12. Calculating sample size and power
13. Selection of study population
14. Study plan and project management
15. Designing data collection tools
16. Principles of data collection
17. Data management
18. Overview of data analysis
19. Ethical framework for health research

20. Conducting clinical trials
21. Preparing a concept paper for research projects
22. Elements of a protocol for research studies
23. Publication Ethics

A student should be expert in good history taking, physical examination, providing basic life support and advanced cardiac life support, common procedures like FNAC, Biopsy, aspiration from serous cavities, lumbar puncture etc. The student should be able to choose the required investigations.

**Clinical cases and Symptoms-based approach to the patient with:**

1. Ulcers in oral cavity
2. Solitary nodule of the thyroid
3. Lymph node in the neck
4. Suspected breast lump
5. Benign breast disease
6. Acute abdominal pain
7. Blunt Trauma Abdomen
8. Gall stone disease
9. Dysphagia
10. Chronic abdominal pain
11. Epigastric mass
12. Right hypochondrium mass
13. Right iliac fossa mass
14. Renal mass
15. Inguino-scrotal swelling
16. Scrotal swelling
17. Gastric outlet obstruction
18. Upper gastrointestinal bleeding
19. Lower gastrointestinal bleeding
20. Anorectal symptoms
21. Acute intestinal obstruction
22. Obstructive jaundice
23. Acute retention of Urine
24. Bladder outlet obstruction
25. Haematuria
26. Peripheral vascular disease
27. Varicose veins
28. New born with developmental anomalies
29. Hydronephrosis , Pyonephrosis, perinephric abscess
30. Renal tuberculosis
31. Renal tumors
32. Carcinoma prostate
33. Genital tuberculosis in male

**At the end of the course, post graduate students should be able to perform independently (including perioperative management) the following;**

- Start IV lines and monitor infusions
- Start and monitor blood transfusion
- Venous cut-down
- Start and manage a C.V.P. line
- Conduct CPR (Cardiopulmonary resuscitation)
- Basic/ advance life support
- Endotracheal intubation
- Insert nasogastric tube
- Proctoscopy
- Urethral catheterisation
- Surgical management of wounds
- Biopsies including image guided
- Manage pneumothorax / pleural space collections
- Infiltration, surface and digital Nerve blocks
- Incise and drain superficial abscesses
- Control external hemorrhage
- Vasectomy (Preferably non-scalpel)
- Circumcision
- Surgery for hydrocele
- Surgery for hernia
- Surgery and Injection/banding of piles
- Management of all types of shock
- Assessment and management of burns
- Hemithyroidectomy
- Excision of thyroglossal cyst
- Excision Biopsy of Cervical Lymphnode
- Excision of benign breast lump
- Modified Radical mastectomy
- Axillary Lymphnode Biopsy
- Excision of gynaecomastia
- Excision of skin and subcutaneous swellings
- Split thickness skin graft
- Management of hernias
- Laparoscopic and open cholecystectomy
- Management of Liver abscess
- appendectomy
- Management of intestinal obstruction, small bowel resection, perforation and anastomosis
- Colostomy



**The student must have observed or assisted (the list is illustrative) in the following:**

- Hartmann's procedure for cancer rectum
- Splenectomy (emergency)
- Stomach perforation
- Varicose Vein surgery
- Craniotomy (Head Injury)
- Superficial parotidectomy
- Sub mandibular gland excision
- Soft tissue tumours including sarcoma
- Pancreaticoduodenal resection
- Hydatid cyst liver
- Pancreatic surgery
- Retroperitoneal operations

## **VII. TEACHING AND LEARNING METHODS**

### **Teaching methodology**

Didactic lectures are of least importance; small group discussion such as seminars, journal clubs, symposia, reviews and guest lectures should get priority for theoretical knowledge. Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning with appropriate emphasis on e-learning. Student should have hand-on training in performing various procedures and ability to interpret various tests/investigations. Exposure to newer specialized diagnostic/therapeutic procedures concerning her/his subject should be given. Self-learning tools like assignments and case-based learning may be promoted.

### **1. Clinical postings**

A major portion of posting should be in General Surgery. It should include in-patients, out-patients, ICU, trauma, emergency room and speciality clinics.

#### **Rotation of posting**

- Inter-unit rotation in the department should be done for a period of up to one year.
- Rotation in appropriate related subspecialties for a total period not exceeding 06 months.

### **2. Clinical meetings:**

There should be intra- and inter- departmental meetings for discussing the uncommon / interesting cases involving multiple departments.

**3. Log book:** Each student must be asked to present a specified number of cases for clinical discussion, perform procedures/tests/operations/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book. The Log books shall be checked and assessed periodically by the faculty members imparting the training.

**4. Thesis writing and research:**

Thesis writing is compulsory.

5. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

6. A postgraduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

7. The student should know the basic concepts of research methodology, plan a research project, be able to retrieve information from the library. The student should have a basic knowledge of statistics.

8. Department should encourage e-learning activities.

**During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in the medical colleges is mandatory.**

**VIII. ASSESSMENT:**

Assessment should be comprehensive & objective. It should address the stated competencies of the course. The assessment needs to be spread over the duration of the course.

**A) FORMATIVE ASSESSMENT, i.e., assessment during the training would include: Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.**

**General Principles**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

**Quarterly assessment during the MS training should be based on following educational activities:**

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

**The student shall be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).**

**B) SUMMATIVE ASSESSMENT, ie., assessment at the end of training**

- The summative examination would be carried out as per the Postgraduate Medical Education Regulations, 2000 amended from time to time.
- The examination shall be conducted at the end of the third academic year.
- The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

**Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.

3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three examiners concerned.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

#### **IX. FORMAT OF THE EXAMINATION:**

Postgraduate examinations, in any subject shall consist of Thesis, Theory Papers, and Clinical/Practical and Oral examinations.

##### **1. Thesis:**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

##### *Guide*

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

##### *Co-guide*

- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides by the guide subject to approval by a Committee consisting of the Head of the Department and the Dean. There will be no restriction on the number of co-guides; as many eligible faculty who are postgraduate teachers as deemed appropriate may be permitted to act as co-guides.

### *Change of guide*

- In the event of a registered guide leaving the college for any reason or in the event of death, the guide, may be changed with prior permission from the Committee constituted by the Head of the Department and the Dean
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II) 6 months before the Theory and Clinical / Practical examination.
- Students who have not submitted the thesis within the stipulated time frame as notified by the University shall not be allowed to appear for the final examination.
- For MD/ MS Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

### **2. Theory:**

There shall be four theory papers, each of 3 hours duration. Out of these one shall be of Basic Medical Sciences and one shall be on recent advances.

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.
- Moderation of Question Papers :

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

Theory shall consist of four papers of 3 hours each.

**Paper I:** Basic Sciences

**Paper II:** Principles and Practice of Surgery

**Paper III:** Principles and practice of Operative Surgery

**Paper IV:** Recent Advances in Surgery & Biostatistics, Research Methodology, Epidemiology.

• **Distribution of Marks**

	<u>Duration</u>	<u>Marks</u>
Theory paper-1	3 hours	100
Theory paper-2	3 hours	100
Theory paper-3	3 hours	100
Theory paper-4	3 hours	100
Clinical / Practical		200
Viva-voce		100

**Theory examination duration: 3 Hours**

<b>Paper</b>	<b>Pattern and marks</b>	<b>Syllabus to be included</b>
Paper I	10 questions each carrying 10 marks. All the questions are to be answered. Total = 100 marks	<b>Basic Sciences in Surgery</b>
Paper II	10 question each carrying 10 marks. All the questions are to be answered. Total = 100 marks	Principles and Practice of Surgery
Paper III	10 questions each carrying 10 marks. All the questions are to be answered. Total = 100 marks	Principles and practice of Operative Surgery
Paper IV	10 questions, each carrying 10 marks (8 questions from recent advances in general surgery 2 questions from biostatistics, research methodology & epidemiology)  All the questions are to be answered. Total 100 marks	Recent Advances in Surgery & Biostatistics, Research Methodology, Epidemiology

**3. Clinical / Practical and viva voce Examination**

- Clinical examination shall be conducted to test the knowledge, skills, attitude and competence of the post graduate students for undertaking independent work as a specialist/Teacher, for which post graduate students shall examine a minimum one long case and two short cases.
- The Oral examination shall be thorough and shall aim at assessing the post graduate student's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.
- Assessment may include Objective structured clinical examination.(OSCE). Oral/Viva-voce examination needs to assess knowledge on X-rays, instrumentation, operative procedures. Due weight age should be given to Log Book Records and day- to-day observation during the training
- **Practical / Clinical & Viva Examination pattern:**

	Description	Marks
Long Cases* (one) Short cases (two)	-	100 marks 2 X 50 marks each = 100 marks
	Clinical / practical <b>Total marks</b>	= 200
Viva	Radiology (Radiographs, Ultrasonography, CT, MRI, etc.,)	25
	Operative procedures	25
	Instruments and specimens	25
	Recent advances and post operative management	25
	<b>Total marks</b>	100

- **Marking System for the Examination :**

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

• **Appointment of Examiners :**

1. All the Post Graduate Examiners shall be recognized Post Graduate Teachers holding recognized Post Graduate qualifications in the subject concerned.
2. No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
3. As per MCI, the Teachers in a medical college or institution having a total of 8 years teaching experience out of which at least 4 years teaching experience as Assistant Professor with at least one research publication in indexed journals gained after obtaining postgraduate degree shall be recognized as post graduate teacher in broad specialties.
4. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .
5. There shall be a panel of eight external examiners from outside the state as advised by the Head of the department. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

Total number of examiners required	-	Four
a. Internal Examiners	-	Two
b. External Examiners	-	Two

6. The Controller of Examinations shall have the powers to appoint two external examiners from among the panel of examiners recommended by the HOD.
7. If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
8. An examiner shall ordinarily be appointed for not more than two consecutive terms.
9. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

**X. RECOMMENDED READING:**

Books (latest edition)

1. *Text Book of Surgery*, by Christopher Davis



2. ASI Text Book of Surgery
3. *Surgery of Colon, Rectum and Anal canal*, by Goligher J C
4. *Schwartz Text Book of Surgery*
5. *Textbook on Laparoscopic Surgery*
6. *Trauma (Mattox)*
7. *Recent Advances in Surgery-irving taylor*
8. *Year Book of Surgery*
9. *Surgical Clinics of North America*
10. *Short practice of Surgery* by Bailey and Love
11. *A manual of clinical Surgery*, by S Das
12. Hamilton Bailey's demonstration of clinical signs
13. *Pye's Surgical Handicraft*
14. Text book of surgery - Sabiston
15. Operative surgery - Rob & Smith
16. Maingot's abdominal operative surgery

#### **BIOSTATICS, EPIDEMIOLOGY, RESEARCH METHODOLOGY**

- Rothman and Green land, Modern Epidemiology
- David Sachett, Epidemiology
- A.B. Hill, Medical Statistics

#### **Journals**

03-05 international Journals and 02 national (all indexed) journals

**Annexure I**

**Postgraduate Students Appraisal Form Pre / Para /Clinical Disciplines**

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis / Research work										
7.	Log Book Maintenance										

Publications Yes/ No

Remarks\*

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**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD



**PLAGIARISM**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**  
**(A University established by an Act of A.P. State Legislature)**

**GUIDELINES FOR 'PLAGIARISM' CHECK**  
**WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D**  
**students**

**Ref.: Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for ThefRses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

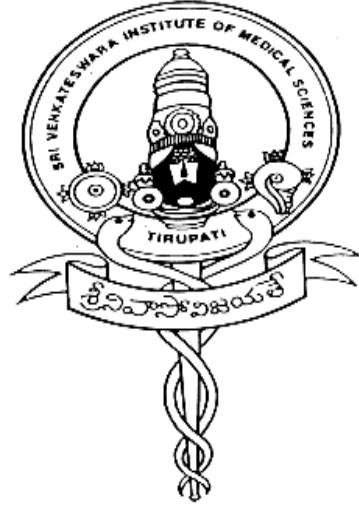
They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

####

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
(A University established by an Act of Andhra Pradesh Legislature)

TIRUPATI - 517 507



COMMON FOR MD/ MS/ DM/ M.Ch. POSTGRADUATES

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

## PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :

*(Preferably be done by the faculty with whom the resident worked for most part of the period)*

### **Quality parameters being Assessed:**

1. Donor / Patient Evaluation
2. Academic Knowledge about Donor / Patient's Problems
3. Curiosity about unexplained Observations
4. Donor / Patient Care
5. Donor / Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

*Signature of the candidate*

*Signature of the guide*

*Signature of the HoD with seal*

**DETAILS OF POSTINGS OVER 3 YEARS**

**1st YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>

Total :

*Signature of Faculty :*

**2nd YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>

Total :

3rd YEAR From..... To.....

MONTH	AREA OF POSTING	DEPARTMENT / UNIT

Total :

*Signature of Faculty.*

**Thesis Topic :**

**Guide :**

**Co-Guides :**



### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Journal Review Presentations:

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material, Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyze the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**CASES PRESENTED IN MORTALITY CONFERENCE**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LAB / INVASIVE PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>

**CONFERENCES ATTENDED**

<b>S. No.</b>	<b>Name</b>	<b>Role</b>	<b>Signature of supervising Faculty</b>

**PUBLICATIONS**

<b>S. No.</b>	<b>Topic</b>	<b>Journal</b>	<b>Role</b>

**BEDSIDE CASE DISCUSSION**

<b>S. No.</b>	<b>Date</b>	<b>Diagnosis</b>	<b>Signature of Faculty Presented to</b>

## SUMMARY OF LOG BOOK

*(To be filled at the end of the course & retained in this book)*

- Name of the student : Admn. No.
- Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_
- Name of the Institute:
- 1) No. of Journal Review Presentations : Presented ..... Attended .....
  - 2) No. of Seminar Presentations : Presented ..... Attended .....
  - 3) No. of Clinical Presentations : Presented ..... Attended .....
  - 4) No. of Case Presentations : Presented ..... Attended .....
  - 5) No. of UG Teaching Programmes : Conducted ..... Attended .....
  - (Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
  - 6) No. of PG Teaching Programmes : Attended
  - 7) No. of Investigative Procedures : Performed .....Assisted.....Observed...
  - 8) No. of Major Operations /  
Procedures /  
Experiments : Performed .....Assisted.....Observed...
  - 9) No. of Minor Operations /  
Procedures /  
Experiments : Performed .....Assisted.....Observed...
  - 10) No. of Emergencies : Performed .....Assisted.....Observed...
  - 11) No. of Medico-legal work : Performed .....Assisted.....Observed...
  - 12) No. of Public Health Visit /  
Social work /  
Survey /  
Immunization /  
Camps
  - 13) No. of Clinico-PathologicalConference : Presented ..... Attended.....
  - 14) No. of special investigation /  
Procedure : Conducted ..... Attended .....
  - 15) No. of events attended Conferences..... Symposia .....
  - Workshops ..... CME .....
  - 16) Any other activities :

*Signature of the candidate*

*Signature of the guide*

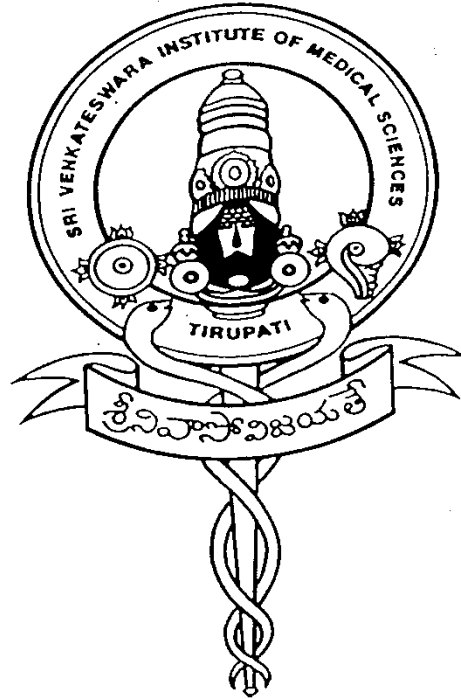
*Signature of the HoD with seal*

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**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI – 517 507**



**M.D. - MEDICINE**

**COMMON BOARD OF STUDIES MEETING  
ON 22.07.2021**

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**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUAPATI**

**COMMON BOARD OF STUDIES MEETING HELD ON 22.07.2021**

**DOCTOR OF MEDICINE (MEDICINE)**

**INDEX**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**

**M.D (MEDICINE)**

**COMMON BOARD OF STUDIES MEETING ON 22.07.2021**

**List of Members:**

1. Dr B. Siddhartha Kumar - Chairman  
Dean, SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar, SVIMS, Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr YS Raju - External Expert  
Professor  
Department of General Medicine  
NIMS, Hyderabad  
Telangana
4. Dr Alladi Mohan - Internal Expert  
Professor (Senior Grade) & HoD  
Dept. of Medicine  
SVIMS, Tirupati.
6. Dr D.T. Katyarmal - Internal Expert  
Professor  
Dept. of Medicine  
SVIMS, Tirupati



**I. Regulations**

**Governing the Doctor of Medicine (Medicine) programme**

**1. Title of the programme**

The programme shall be called **Doctor of Medicine (Medicine)**

**2. Eligibility for admission**

A candidate who has passed final year M.B.B.S. examination after pursuing study in a medical college recognized by the Medical Council of India (MCI) and has completed one year compulsory rotating internship in a teaching Institution or other Institution recognized by the MCI, and has obtained permanent registration of any State Medical Council shall be eligible for admission.

**3. Duration of the programme**

The programme shall be a three full-academic year residency programme. As per current MCI regulations, the academic year begins on 1 May of each year.

**4. Syllabus**

The Board of Studies shall prepare and approve syllabus. Also it shall review the same periodically (Appendix II).

**5. Admission**

Admission to the MD (Medicine) course will be based on merit through PG-NEET/NEXT or other examinations conducted by NMC for the said academic year time to time

**6. Bond**

- i) The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/- value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. **5,00,000/- (Rupees Five Lakhs only)** along with the full stipend amount received by him/her back to the Institute.

- ii) The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.20,00,000 (Rupees Twenty lakhs only).

## **7. Attendance**

All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

## **8. Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

## **9. District Residency Programme (No.MCI-18(1)/2020-Med./121415)**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as "**District Residency Programme (DRP)**" and the postgraduate medical student undergoing training shall be termed as a "**District Resident**".

## **9. Plagiarism**

While submitting the thesis, the plagiarism clearance report to be attached as per the regulations of SVIMS university (for detailed regulations see the Appendix III).

## **II. ASSESSMENT:**

**FORMATIVE ASSESSMENT**, during the training programme Formative assessment will be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

### **General Principles**

Internal Assessment will be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment will be conducted in theory and practical/clinical examination.

### **Quarterly assessment during the MD training will be based on:**

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

Internal assessment is done daily to assess the training and to identify the strengths and weaknesses of the postgraduate student.

- (a) Log Book (Appendix-I) with details of duration of postings, skills performed with remarks of the Teacher/Faculty member will be maintained and periodically updated by the postgraduate student.
- (b) Research work to be assessed and reviewed once in four months by the Chief-guide and the Head of the Department.

(c) Evaluation sheets for seminar and journal clubs with the following points for the purpose of assessment.

- (i) Choice of article/topic (unless specifically allotted).
- (ii) Completeness of presentation.
- (iii) Clarity and cogency of presentation.
- (iv) Understanding of the subject and ability to convey the same.
- (v) Whether relevant references have been consulted.
- (vi) Ability to convey points in favour and against the subject under discussion.
- (vii) Use of audio-visual aids.
- (viii) Ability to answer questions.
- (ix) Time scheduling.
- (x) Overall performance.

(d) The student will be assessed periodically as per categories listed in postgraduate student appraisal form (Appendix -I).

#### **B) SUMMATIVE ASSESSMENT, namely, assessment at the end of training**

- The summative examination would be carried out as per The Postgraduate Medical Education Regulations, 2000 as amended from time to time.
- The examinations shall be conducted at the end of the third academic year.
- The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

#### **Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension

of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.

2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three examiners concerned.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

### III. Format of the Examination:

Postgraduate examinations, in any subject shall consist of Thesis , Theory Papers, and Clinical/Practical and Oral examinations.

**1. Thesis:** Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

#### *Guide*

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

#### *Co-guide*

- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.

#### *Change of guide*

- In the event of a registered guide leaving the college for any reason or in the event of death, the guide, may be changed with prior permission from the Committee constituted by the Head of the Department and the Dean.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II) six months before the Theory and Clinical / Practical examination.

- Students who have not submitted the thesis within the stipulated time frame shall not be allowed to appear for the final examination. Only those students whose theses have been approved by the panel of external examiners shall be eligible to appear for the final examination.
- For MD Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

## 2. Theory:

The examinations shall be organised on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four theory papers, each of 3 hours duration. As detailed below; Out of these one shall be of Basic Medical Sciences and one shall be on recent advances.;

**Paper I :** Basic Medical Sciences

**Paper II :** Medicine and allied specialties including dermatology & psychiatry

**Paper III:** Tropical Medicine and Infectious Diseases

**Paper IV:** Recent Advances in Medicine, Biostatistics, Biostatistics, Research Methodology and Epidemiology

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the Faculty in the concerned subject from outside the state of Andhra Pradesh, who shall be a recognized PG teacher as per NMC norms and who may or may not be involved in the clinical/practical examination. The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state

- **Moderation of Question Papers :**

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

- **3. Clinical/Practical & Oral Examination :**

- Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.
- The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

The final clinical examination will include:

- cases pertaining to major systems
- stations for clinical, procedural and communication skills
- Log Book Records and day-to-day observation during the training



### **Marking System for the Examination :**

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

### **Appointment of Examiners :**

- All the Post Graduate Examiners shall be recognized Post Graduate Teachers holding recognized Post Graduate qualifications in the subject concerned.
- No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
- As per MCI, the Teachers in a medical college or institution having a total of 8 years teaching experience out of which at least 4 years teaching experience as Assistant Professor with at least one research publication in indexed journals gained after obtaining postgraduate degree shall be recognized as post graduate teacher in broad specialties.
- For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognized university, from outside the State .
- There shall be a panel of eight external examiners from outside the state as advised by the Head of the department.
- Total number of examiners required - Four  
Internal Examiners - Two  
External Examiners - Two

- The Controller of Examinations shall have the powers to appoint two external examiners from among the panel of examiners recommended by the HOD.
- If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
- An examiner shall ordinarily be appointed for not more than two consecutive terms.
- The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

### Scheme of examination

#### Distribution of Marks

	<u>Duration</u>	<u>Marks</u>
Theory paper-1	3 hours	100
Theory paper-2	3 hours	100
Theory paper-3	3 hours	100
Theory paper-4	3 hours	100
Clinicals / Practicals		200
<i>Viva-voce</i>		100
Total marks :		700

### IV. EXAMINATION PATTERN

#### Theory examination duration: 3 Hours

Paper	Pattern and marks	Syllabus to be included
Paper I	10 questions each carrying 10 marks. All the questions are to be answered.  Total = 100 marks	Basic Sciences in Medicine, Clinical Pharmacology, Genetics and Nutrition
Paper II	10 questions each carrying 10 marks. All the questions are to be answered.  Total = 100 marks	Medicine and allied specialties including Dermatology and Psychiatry.
Paper III	10 questions each carrying 10 marks. All the questions are to be answered.	Tropical Medicine and Infectious Diseases.

	Total = 100 marks	
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PaperIV	10 questions each carrying 10 marks. All the questions are to be answered.  Total = 100 marks	Recent advances in Medicine, Biostatistics, Research Methodology and Epidemiology
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### Practical / Clinical Examination :

Not more than 8 postgraduate students shall be examined per day in Clinical/Practical and *viva-voce*.

	Description	Marks
Long Cases*	-	100 marks
(one) Short cases (two)		2 X 50 marks each = 100 marks
	Clinicals / practicals <b>Total marks</b>	= 200
Viva	Radiology (Radiographs, Ultrasonography, CT, MRI, etc.,)	25
	ECG / Lab Investigations	25
	Therapeutics / Emergencies	25
	Recent advances	25
	<b>Total marks</b>	100

A structured three year training programme for MD (Medicine) arranged in the form of postings to different medical specialties for specified periods as outlined for duration of 36 months. *Postings of schedules may be modified depending on needs, feasibility and exigencies.*

(i) First Year Residency

- a) Out-patient and in-patient care
- b) Managing medical emergencies
- c) Learning diagnostic/ therapeutic procedures and interventions
- d) Interpreting Reports
- e) Writing up a thesis protocol, obtaining institutional ethical committee clearance, submitting the same and starting the thesis work
- g) Use of computers in medicine

(ii) Second Year Residency

- a) Out-patient and in-patient care
- b) Rotation (one year) in existing allied specialities such as Cardiology, Neurology, Endocrinology, Gastroenterology, Nephrology, Medical Oncology, Casualty and Medical Intensive Care Unit
- c) Conducting medical procedures independently
- d) Continuation of thesis work.
- e) District Residency Programme

(iii) Third Year Residency

- a) Out-patient and in-patient care
- b) Independent management of emergencies
- c) Teaching junior Residents / under-graduate students enrolled in the subject
- d) Analysis and submission of thesis

## V. READING MATERIAL

### (a) Text Books

#### MEDICINE

- Harrison's principles of internal medicine
- Oxford textbook of medicine
- Cecil's textbook of medicine
- API Textbook of medicine
- Hutchison's clinical methods
- Macleod's clinical methods
- Chamberlain's clinical methods
- Alagappan, Clinical methods
- Manual of Medical Therapeutics (Washington Manual)

#### NEUROLOGY

- Bickerstaff, Clinical methods in neurology
- Victor Adams, Neurology
- John Patten Localization in Neurology
- Paul Brazis, Localization in Neurology

- Dejong, Neurological examination

## **CARDIOLOGY**

- Braunwald, Cardiology
- Hurst, Cardiology
- Somaraju, Clinical methods in cardiology
- Jules Constant, Bedside cardiology
- Perloff, Congenital heart disease
- Goldberger, Electrocardiography

## **GASTROENTEROLOGY**

- Sheila Sherlock, Diseases of the liver and biliary system
- Schleisinger, diseases of the gastrointestinal system
- Tandon and Nundy, Tropical Gastroenterology

## **RESPIRATORY MEDICINE AND TUBERCULOSIS**

- Crofton Douglas, Diseases of the respiratory system
- Murray and Nadel, Respiratory diseases
- Fraser and Pare, Respiratory diseases
- JN Pande, Respiratory medicine in the tropics
- Richard Light, Pleural diseases
- Sharma and Mohan, Tuberculosis and nontuberculous mycobacterial diseases

## **TROPICAL MEDICINE**

- Manson Bahr, Tropical Medicine
- Reese, A practical Approach to Infectious Diseases

## **NEPHROLOGY**

- Brenner, Rector, Nephrology
- Oxford textbook of nephrology
- Oxford textbook of rheumatology
- Kelley's textbook of rheumatology

## **ENDOCRINOLOGY**

- William's Endocrinology

## **HAEMATOLOGY**

- Wintrobe's Haematology

## **GERIATRICS**

- Geriatric Medicine

## **BIOSTATISTICS, EPIDEMIOLOGY, RESEARCH METHODOLOGY**

- Rothman and Greenland, Modern Epidemiology
- David Sackett, Epidemiology
- A.B. Hill, Medical Statistics

## **MEDICAL ONCOLOGY**

- Devita, Principles and practice of Oncology

## **RECENT ADVANCES**

- MMS Ahuja, Progress in clinical medicine series (5 volumes)
- MMS Ahuja, Advances in clinical medicine
- Sharma and Mohan, Recent advances in respiratory medicine(all volumes in the series)

## **JOURNALS**

New England Journal of Medicine

The Lancet

JAMA

BMJ

Postgraduate Medical Journal

Annals of Internal Medicine

QJM

Clinical Infectious Diseases

Archives of Internal Medicine

Transactions of the Royal Society of Tropical Medicine and Hygiene

Medical Clinics of North America

European Respiratory Journal

Thorax

National Medical Journal of India

Indian Journal of Medical Research

J Assoc Physicians India

J Indian Med Assoc

J Indian Assoc Clinical Med

Indian Journal of Chest Diseases and Allied Sciences

American Journal of Respiratory and Critical Care Medicine

International Journal of Tuberculosis and Lung Diseases

Chest

## **MONOGRAPHS**

Medicine Update series (APICON)

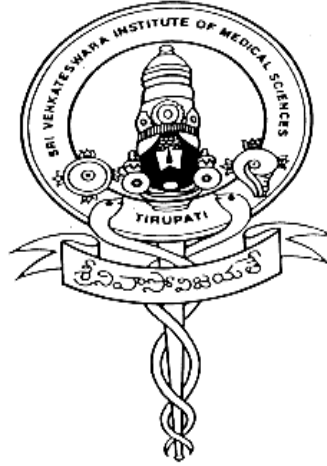
Postgraduate Medicine series (APICON)

Monographs of the Indian College of Physicians (ICP)

**Appendix I**

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES, TIRUPATI**

(A University established by an Act of Andhra Pradesh Legislature)



**LOG BOOK FOR POSTGRADUATES  
MD/MS/DM/M.Ch.**

Name of the Candidate : .....

Subject / Course : .....

Date of Admission : .....Admn. No. ....

**PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES**

NAME OF THE POSTGRADUATE :

SUBJECT :

PERIOD OF ASSESSMENT :

DATE      MONTH      YEAR      TO      DATE      MONTH      YEAR  
                                  

POSTING DURING ABOVE PERIOD:

ASSESSMENT DONE BY :

(Should preferably be done by the faculty with whom the resident worked for most part of above period)

**QUALITY BEING ASSESSED**

1. Patient Evaluation
2. Academic Knowledge About Patients Problems
3. Curiosity about unexplained Observations
4. Patient Care
5. Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

PROFORMA SHOWN TO POSTGRADUATE CONCERNED :

SIGNATURE OF CONCERNED POSTGRADUATE :

CONCERNED FACULTY :



## **DETAILS OF POSTINGS OVER 3 YEARS**

### **1st YEAR**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

Total :

Signature of Faculty :

### **2nd YEAR**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

Total :

Signature of Faculty :

**3rd YEAR**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

Signature of Faculty :

THESIS TOPIC : 1.

CHIEF GUIDE : 2.

CO-GUIDES : 3.





### CASES PRESENTED IN MORTALITY CONFERENCE

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

### LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

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### LAB / INVASIVE PROCEDURES PERFORMED

S. No.	Date	Procedures	Complications if any	Signature of supervising Faculty

### CONFERENCES ATTENDED

S. No.	Name	Role	Signature of supervising Faculty

### PUBLICATIONS

S. No.	Citation


**BEDSIDE CASE DISCUSSION**

S. No.	Date	Diagnosis	Signature of Faculty Presented to


-000-



## SUMMARY OF LOG BOOK

*(To be filled at the end of the course & retained in this book)*

- Name of the student : Admn. No.
- Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_
- Name of the Institute:
- 1) No. of Journal Review Presentations : Presented ..... Attended .....
  - 2) No. of Seminar Presentations : Presented ..... Attended .....
  - 3) No. of Clinical Presentations : Presented ..... Attended .....
  - 4) No. of Case Presentations : Presented ..... Attended .....
  - 5) No. of UG Teaching Programmes : Conducted ..... Attended .....  
(Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
  - 6) No. of PG Teaching Programmes : Attended
  - 7) No. of Investigative Procedures : Performed .....Assisted.....Observed...
  - 8) No. of Major Operations / : Performed  
.....Assisted.....Observed...  
Procedures /  
Experiments
  - 9) No. of Minor Operations / : Performed  
.....Assisted.....Observed...  
Procedures /  
Experiments
  - 10) No. of Emergencies : Performed  
.....Assisted.....Observed...
  - 11) No. of Medico-legal work : Performed  
.....Assisted.....Observed...
  - 12) No. of Public Health Visit /  
Social work /  
Survey /  
Immunization /  
Camps
  - 13) No. of Clinico-PathologicalConference : Presented ..... Attended.....
  - 14) No. of special investigation / : Conducted ..... Attended .....
  - Procedure
  - 15) No. of events attended Conferences..... Symposia .....  
Workshops ..... CME .....
  - 16) Any other activities :
- Signature of the candidate* *Signature of the HoD with seal*

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## Postgraduate Students Appraisal Form

### Pre / Para /Clinical Disciplines

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Name of the Department/Unit :  
 Name of the PG Student :  
 Period of Training : FROM.....TO.....

Sl. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based/recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis/Research work										
7.	Log Book Maintenance										

**Publications**

**Yes/No**

**Remarks\***

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**\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

**SIGN.OF ASSESSEE**

**SIGN.OF HOD**

**SYLLABUS**

**Appendix II**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The competency based training programme aims to produce a post-graduate student who after undergoing the required training should be able to deal effectively with the needs of the community and should be competent to handle all problems related to his/her specialty including recent advances. The student should also acquire skill in teaching of medical/para-medical students in the subject that he/she has received his/her training. He She should be aware of his/her limitations. The student is also expected to know the principles of research methodology and modes of accessing literature.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the pndurpcoosnetenat. This has necessitated retention of "domains of learning" under the heading "competencies".

### ***SUBJECT SPECIFIC OBJECTIVES***

The postgraduate training should enable the student to:

1. Practice efficiently internal medicine specialty, backed by scientific knowledge including basic sciences and skills
2. Diagnose and manage majority of conditions in his specialty (clinically and with the help of relevant investigations
3. Exercise empathy and a caring attitude and maintain professional integrity, honesty and high ethical standards
4. Plan and deliver comprehensive treatment using the principles of rational drug therapy
5. Plan and advise measures for the prevention and rehabilitation of patients belonging to his specialty;
6. Manage emergencies efficiently by providing Basic Life Support (BLS) and Advanced Life Support (ALS) in emergency situations
7. Recognize conditions that may be outside the area of the specialty/ competence and refer them to an appropriate specialist
8. Demonstrate skills in documentation of case details including epidemiological data

9. Play the assigned role in the implementation of National Health Programs
10. Demonstrate competence in basic concepts of research methodology and clinical epidemiology; and preventive aspects of various disease states
11. Be a motivated 'teacher' - defined as one keen to share knowledge and skills with a colleague or a junior or any learner
12. Continue to evince keen interest in continuing education irrespective of whether he/she is in a teaching institution or is practicing and use appropriate learning resources
13. Be well versed with his medico-legal responsibilities
14. Undertake audit, use information technology tools and carry out research - both basic and clinical, with the aim of publishing the work and presenting the work at scientific forums.
15. The student should be able to recognize the mental condition characterized by self absorption and reduced ability to respond to the outside world (e.g. Autism), abnormal functioning in social interaction with or without repetitive behaviour and/or poor communications, etc.

The intended outcome of a competency based program is a consultant specialist who can practice medicine at a defined level of competency in different practice settings. i.e., ambulatory (outpatient), inpatient, intensive care and emergency medicine. No limit can be fixed and no fixed number of topics can be prescribed as course contents. The student is expected to know his subject in depth; however, emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competence in skills commensurate with the specialty (actual hands-on training) must be ensured.

#### ***SUBJECT SPECIFIC COMPETENCIES***

<b>Course code</b>	<b>Name of the Course</b>
IM101	Basic Medical Sciences
IM102	Medicine and Allied Specialities including Dermatology & Psychiatry
IM103	Tropical Medicine and Infectious Diseases
IM104	Recent advances in Medicine
IM105	Practical / Clinical and Viva voce

IM106	Thesis / Research work
IM107	Soft Skills, Attitude, Ethics and Communication

## COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD GENERAL MEDICINE

### Aims of the program: PROGRAM OBJECTIVES:

<b>Program outcomes</b>
<b>A post graduate student upon successfully qualifying in the MD GENERAL MEDICINE examination will be able to:</b>
<ul style="list-style-type: none"> <li>• Practice efficiently internal medicine specialty, backed by scientific knowledge including basic sciences and skills</li> <li>• Diagnose and manage majority of conditions in his specialty (clinically and with the help of relevant investigations)</li> <li>• Exercise empathy and a caring attitude and maintain professional integrity, honesty and high ethical standards</li> <li>• Plan and deliver comprehensive treatment using the principles of rational drug therapy</li> <li>• Plan and advise measures for the prevention and rehabilitation of patients belonging to his specialty;</li> <li>• Manage emergencies efficiently by providing Basic Life Support (BLS) and Advanced Life Support (ALS) in emergency situations</li> <li>• Recognize conditions that may be outside the area of the specialty/ competence and refer them to an appropriate specialist</li> <li>• Demonstrate skills in documentation of case details including epidemiological data</li> <li>• Play the assigned role in the implementation of National Health Programs</li> <li>• Demonstrate competence in basic concepts of research methodology and clinical epidemiology; and preventive aspects of various disease states</li> <li>• Be a motivated 'teacher' - defined as one keen to share knowledge and skills with a colleague or a junior or any learner</li> <li>• Continue to evince keen interest in continuing education irrespective of whether he/she is in a teaching institution or is practicing and use appropriate learning resources</li> <li>• Be well versed with his medico-legal responsibilities</li> <li>• Undertake audit, use information technology tools and carry out research - both basic and clinical, with the aim of publishing the work and presenting the work at scientific forums.</li> </ul>

- The student will be able to recognize the mental condition characterized by self absorption and reduced ability to respond to the outside world (e.g. Autism), abnormal functioning in social interaction with or without repetitive behaviour and/or poor communications, etc.

## COURSE CONTENT - KNOWLEDGE AND SKILLS

<b>Course Outcomes</b>	
<b>Competencies - A. Cognitive Domain</b>	<b>Competency Mapping Course Code</b>
<b>Basic Sciences</b>	
1. Basics of human anatomy as relevant to clinical practice e.g. surface anatomy of various viscera, neuro-anatomy, important structures/organs location in different anatomical locations in the body; common congenital anomalies	IM101
2. Basic functioning of various organ-system, control of vital functions, patho-physiological alteration in diseased states, interpretation of symptoms and signs in relation to patho-physiology	IM101, IM102
3. Common pathological changes in various organs associated with diseases and their correlation with clinical signs; understanding various pathogenic processes and possible therapeutic interventions possible at various levels to reverse or arrest the progress of diseases.	IM101 IM102
4. Knowledge about various microorganisms, their special characteristics important for their pathogenetic potential or of diagnostic help; important organisms associated with tropical diseases, their growth pattern/life-cycles, levels of therapeutic interventions possible in preventing and/or eradicating the organisms	IM101 IM103
5. Knowledge about pharmacokinetics and pharmaco-dynamics of the drugs used for the management of common problems in a normal person and in patients with diseases kidneys/liver etc. which may need alteration in metabolism/excretion of the drugs; rational use of available drugs	IM101 IM102
6. Knowledge about various poisons with specific reference to different geographical and clinical settings, diagnosis and management.	IM102
7. Research Methodology and Studies, epidemiology and basic Biostatistics	IM101
8. National Health Programmes.	IM102

9. Biochemical basis of various diseases including fluid and electrolyte disorders; Acid base disorders etc.	IM101 IM102
10. Recent advances in relevant basic science subjects	IM101 IM104
<b>Systemic Medicine</b>	
1. Preventive and environmental issues, including principles of preventive health care, immunization and occupational, environmental medicine and bio-terrorism.	IM103
2. Aging and Geriatric Medicine including Biology, epidemiology and neuro-psychiatric aspects of aging	IM101
3. Clinical Pharmacology - principles of drug therapy, biology of addiction and complementary and alternative medicine	IM101
4. Genetics - overview of the paradigm of genetic contribution to health and disease, principles of Human Genetics, single gene and chromosomal disorders and gene therapy.	IM101
5. Immunology - The innate and adaptive immune systems, mechanisms of immune mediated cell injury and transplantation immunology.	IM101
6. Cardio-vascular diseases - Approach to the patient with possible cardio-vascular diseases, heart failure, arrhythmias, hypertension, coronary artery disease, valvular heart disease, infective endocarditis, diseases of the myocardium and pericardium and diseases of the aorta and peripheral vascular system	IM102, IM101
7. Respiratory system - approach to the patient with respiratory disease, disorders of ventilation, asthma, Congenital Obstructive Pulmonary Disease (COPD), Pneumonia, pulmonary embolism, cystic fibrosis, obstructive sleep apnoea syndrome and diseases of the chest wall, pleura and mediastinum	IM102, IM101

8. Nephrology - approach to the patient with renal diseases, acid-base disorders, acute kidney injury, chronic kidney disease, tubulo-interstitial diseases, nephrolithiasis, Diabetes and the kidney, obstructive uropathy and treatment of irreversible renal failure	IM102, IM101
9. Gastro-intestinal diseases - approach to the patient with gastrointestinal diseases, gastrointestinal endoscopy, motility disorders, diseases of the oesophagus, acid peptic disease, functional gastrointestinal disorders, diarrhea, irritable bowel syndrome, pancreatitis and diseases of the rectum and anus.	IM102, IM101
10. Diseases of the liver and gall bladder - approach to the patient with liver disease, acute viral hepatitis, chronic hepatitis, alcoholic and non-alcoholic steatohepatitis, cirrhosis and its sequelae, hepatic failure and liver transplantation and diseases of the gall bladder and bile ducts	IM102, IM101
11. Haematologic diseases - haematopoiesis, anaemias, leucopenia and leucocytosis, myelo-proliferative disorders, disorders of haemostasis and haemopoietic stem cell transplantation	IM102, IM101
12. Oncology - epidemiology, biology and genetics of cancer, paraneoplastic syndromes and endocrine manifestations of tumours, leukemias and lymphomas, cancers of various organ systems and cancer chemotherapy	IM102, IM101
13. Metabolic diseases - inborn errors of metabolism and disorders of metabolism.	IM102, IM101
14. Nutritional diseases - nutritional assessment, enteral and parenteral nutrition, obesity and eating disorders.	IM102, IM101
15. Endocrine - principles of endocrinology, diseases of various endocrine organs including diabetes mellitus	IM102, IM101
16. Rheumatic diseases - approach to the patient with rheumatic diseases, osteoarthritis, rheumatoid arthritis, spondyloarthropathies, systemic lupus erythematosus (SLE), polymyalgia, rheumatic fibromyalgia and amyloidosis	IM102, IM101
17. Infectious diseases - Basic consideration in Infectious Diseases, clinical syndromes, community acquired clinical syndromes. Nosocomial infections, Bacterial diseases - General consideration, diseases caused by gram - positive bacteria, diseases caused by gram - negative bacteria, miscellaneous bacterial infections, Mycobacterial diseases, Spirochetal diseases, Rickettsia, Mycoplasma and Chlamydia, viral	IM103, IM101



diseases, DNA viruses, DNA and RNA respiratory viruses, RNA viruses, fungal infections, protozoal and helminthic infections	
18. Neurology - approach to the patient with neurologic disease, headache, seizure disorders and epilepsy, coma, disorders of sleep, cerebrovascular diseases, Parkinson's disease and other movement disorders, motor neuron disease, meningitis and encephalitis, peripheral neuropathies, muscle diseases, diseases of neuromuscular transmission and autonomic disorders and their management	IM102, IM101
19. The mental condition characterized by complete self absorption with reduced ability to communicate with the outside world (Autism), abnormal functioning in social interaction with or without repetitive behaviour and/or poor communication etc.	IM102, IM101
20. Dermatology - Structure and functions of skin, infections of skin, papulo-squamous and inflammatory skin rashes, photo-dermatology, erythroderma, cutaneous manifestations of systematic diseases, bullous diseases, drug induced rashes, disorders of hair and nails, principles of topical therapy.	IM102, IM101
<b>B. Affective Domain:</b>	
<ol style="list-style-type: none"> <li>1. Will be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.</li> <li>2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.</li> <li>3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching</li> </ol>	IM107
<b>B. Psychomotor domain</b>	
<b>1. Clinical Assessment Skills</b>	
<ul style="list-style-type: none"> <li>• Elicit a detailed clinical history</li> <li>• Perform a thorough physical examination of all the systems</li> </ul>	IM105

<b>2. Procedural skills</b>	
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<ul style="list-style-type: none"> <li>• Test dose administration</li> <li>• Mantoux test</li> <li>• Sampling of fluid for culture</li> <li>• IV- Infusions</li> <li>• Intravenous injections</li> <li>• Intravenous canulation</li> <li>• ECG recording</li> <li>• Pleural tap</li> <li>• Lumbar puncture</li> <li>• Cardiac <ul style="list-style-type: none"> <li>▪ TMT</li> <li>▪ Holter Monitoring</li> <li>▪ Echocardiogram</li> <li>▪ Doppler studies</li> </ul> </li> <li>• Cardio Pulmonary Resuscitation (CPR)</li> <li>• Central venous line insertion, CVP monitoring</li> <li>• Blood and blood components matching and transfusions</li> <li>• Arterial puncture for ABG</li> <li>• Fine needle aspiration cytology (FNAC) from palpable lumps</li> <li>• Bone marrow aspiration and biopsy</li> <li>• Abdominal paracentesis - diagnostic</li> <li>• Aspiration of liver abscess</li> <li>• Pericardiocentesis</li> <li>• Joint fluid aspiration</li> <li>• Liver biopsy</li> <li>• Nerve/ muscle/ skin/ kidney/ pleural biopsy</li> <li>• Ultrasound abdomen, echocardiography</li> <li>• Upper GI endoscopy, procto-sigmoidoscopy</li> </ul>	IM105
<p><b>Respiratory management</b></p> <ul style="list-style-type: none"> <li>• Nebulization</li> <li>• Inhaler therapy</li> <li>• Oxygen delivery</li> </ul>	IM105
<p><b>Critically ill person</b></p> <ul style="list-style-type: none"> <li>• Monitoring a sick person</li> <li>• Endotracheal intubation</li> <li>• CPR</li> <li>• Using a defibrillator</li> </ul>	IM105

<ul style="list-style-type: none"> <li>• Pulse oximetry</li> <li>• Feeding tube/Ryle's tube, stomach wash</li> </ul> <p>Naso-gastric intubation</p> <ul style="list-style-type: none"> <li>• Urinary catheterization - male and female</li> <li>• Prognostication</li> <li>• Haemodialysis</li> </ul>	
<p><b>Neurology- interpret</b></p> <p><b>Nerve conduction studies EEG</b></p> <ul style="list-style-type: none"> <li>• Evolved Potential interpretation</li> <li>• Certification of Brain death</li> </ul> <p>Intercostal tube placement with underwater seal Thoracocentesis</p> <ul style="list-style-type: none"> <li>• Sedation</li> <li>• Analgesia</li> </ul>	IM105
<p><b>Laboratory-Diagnostic Abilities</b></p> <ul style="list-style-type: none"> <li>• Urine protein, sugar, microscopy</li> <li>• Peripheral blood smear</li> <li>• Malarial smear</li> <li>• Ziehl Nielson smear-sputum, gastric aspirate</li> <li>• Gram's stain smear-CSF, pus</li> <li>• Stool pH, occult blood, microscopy</li> <li>• KOH smear</li> <li>• Cell count - CSF, pleural, peritoneal, any serous fluid</li> </ul>	IM105
<p><b>Observes the procedure</b></p> <ul style="list-style-type: none"> <li>• Subdural, ventricular tap</li> <li>• Joint Aspiration - Injection</li> </ul> <p><b>Endoscopic Retrograde Cholangio- Pancreatography (ERCP)</b></p> <ul style="list-style-type: none"> <li>• Peritoneal dialysis</li> </ul>	IM105
<p><b>3. Interpretation Skills</b></p>	
<p>Clinical data (history and examination findings), formulating a differential diagnosis in order of priority, using principles of clinical decision making, plan investigative work-up, keeping in mind the cost-effective approach i.e. problem solving and clinical decision-making.</p> <ul style="list-style-type: none"> <li>• Blood, urine, CSF and fluid investigations - hematology, biochemistry</li> <li>• X-ray chest, abdomen, bone and joints</li> </ul>	IM105

<ul style="list-style-type: none"> <li>• ECG</li> <li>• Treadmill testing</li> <li>• ABG analysis</li> <li>• Ultrasonography</li> <li>• CT scan chest and abdomen</li> <li>• CT scan head and spine</li> <li>• MRI</li> <li>• Barium studies</li> <li>• IVP, VUR studies</li> <li>• Pulmonary function tests</li> <li>• Immunological investigations</li> <li>• Echocardiographic studies</li> </ul>	
<p><b>Interpretation under supervision</b>  Hemodynamic monitoring</p> <ul style="list-style-type: none"> <li>• Nuclear isotope scanning</li> <li>• MRI spectroscopy/SPECT</li> <li>• Ultrasound guided aspiration and biopsies</li> </ul>	IM105
<p><b>4. Communication skills</b></p>	
<ul style="list-style-type: none"> <li>• While eliciting clinical history and performing physical examination Communicating health, and disease</li> <li>• Communicating about a seriously ill or mentally abnormal communicating death informed consent</li> <li>• Empathy with patient and family members</li> <li>• Referral letters, and replies</li> <li>• Discharge summaries</li> <li>• Death certificates</li> <li>• Pre-test counseling for HIV</li> <li>• Post-test counseling for HIV</li> <li>• Pedagogy - teaching students, other health functionaries lectures, besides clinics, discussions</li> <li>• Health education - prevention of common medical problems, promoting healthy life-style, immunization, periodic health screening, counseling skills in risk factors for common malignancies, cardiovascular disease, AIDS</li> <li>• Dietary counselling in health and disease</li> <li>• Case presentation skills including recording case history / examination, preparing follow-up notes, preparing referral notes, oral presentation of new cases / follow-up cases</li> </ul>	IM107

<ul style="list-style-type: none"> <li>• Co -coordinating care – team work (with house staff, nurses, faculty etc.)</li> <li>• Linking patients with community resources</li> <li>• Providing referral</li> <li>• Genetic counselling</li> </ul>	
<b>5. Others</b>	
<p>Demonstrating</p> <ul style="list-style-type: none"> <li>- professionalism</li> <li>- ethical behavior (humane and professional care to patients)</li> </ul> <p>Utilization of information technology</p> <ul style="list-style-type: none"> <li>- Medicine search, Internet access, computer usage Research methodology</li> <li>- Designing a study</li> <li>- Interpretation and presentation of scientific data</li> </ul> <p>Self-directed learning</p> <ul style="list-style-type: none"> <li>- identifying key information sources</li> <li>- literature searches</li> <li>- information management</li> </ul> <p>Therapeutic decision-making</p> <ul style="list-style-type: none"> <li>- managing multiple problems simultaneously</li> <li>- assessing risks, benefits and costs of treatment options</li> <li>- involving patients in decision-making</li> <li>- selecting specific drugs within classes</li> <li>- Rational use of drugs</li> </ul>	IM107

PLAGIARISM GUIDELINES  
SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI  
(A University established by an Act of A.P. State Legislature)

GUIDELINES FOR 'PLAGIARISM' CHECK  
WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D  
students

Ref.:Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019

The students of the MD/DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for ThefRses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

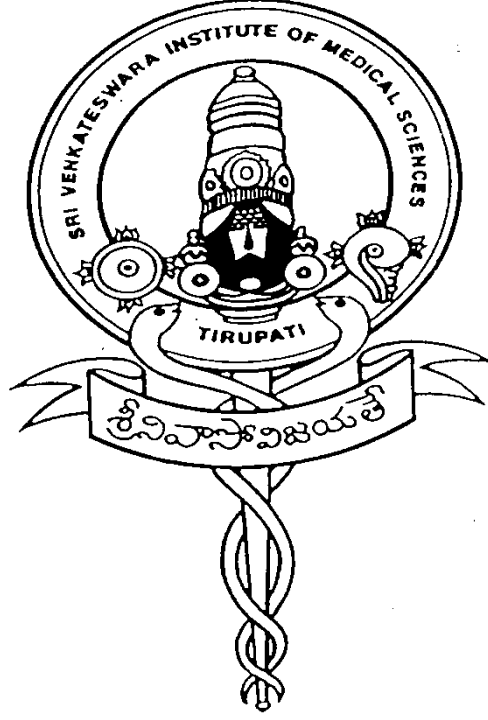
1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report .
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/ dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/ dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/ dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/ dissertation at the time of submission to the Controller of Examinations.

All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

# **SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES**

*(A University established by an act of Andhra Pradesh State Legislature)*

**TIRUPATI – 517 507**



**M.D. RADIO DIAGNOSIS COURSE**

**COMMON BOARD OF STUDIES MEETING**

**ON 22.07.2021**

**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES, TIRUPATI**

**M.D. RADIO DIAGNOSIS COURSE**

**COMMON BOARD OF STUDIES MEETING HELD ON 22.07.2021**

**I N D E X**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**

**M.D. (RADIO-DIAGNOSIS)**

**COMMON BOARD OF STUDIES MEETING ON 22.07.2021**

**List of Members:**

1. Dr B. Siddhartha Kumar - Chairman  
Dean,  
SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar,  
SVIMS, Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr. Y.Jyotsna Rani, - External expert  
Professor & HoD  
Nizam's Institute of Medical Sciences,  
Hyderabad  
Ph.No.98499 88000  
Email ID: jyotsna@yahoo.com
5. Dr B. Vijaya Lakshmi Devi - Internal expert  
Professor & HoD i/c  
Dept. of Radiology  
SVIMS, Tirupati.
6. Dr S. Sarala - Internal expert  
Professor  
Dept. of Radiology  
SVIMS, Tirupati

# **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D., IN RADIO-DIAGNOSIS**

## **(As prescribed by MCI, 2018)**

### **Preamble:**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. The Goal of this program is to impart training in conventional and modern radiology and imaging techniques so that the post graduate student becomes well versed and competent to practice, teach and conduct research in the discipline of radiology. The student should also acquire basic knowledge in the various sub-specialities of radiology. These Guidelines also would also help to standardize Radiodiagnosis teaching at post graduate diploma (DMRD) level throughout the country so that it will benefit in achieving competent radiologist with appropriate expertise. The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

### **I. AIMS & OBJECTIVES**

#### **General:**

The aim of the training is to enable the trainee capable of practicing independently as a competent Clinical Radiologist. The trainee should be compassionate and ethical in their practice of Radio diagnosis and would also contribute to the future developments in Radio diagnosis.

- Three broad domains of the objectives are:
- Cognitive domain (Knowledge)
- Psychomotor domain (Skills)
- Attitudinal domain (Human values, ethical practice etc.)

#### ***Cognitive Domain (Knowledge)***

- Describe aetiology, pathophysiology, and principles of diagnosis and management of common problems including emergencies, in adults and children.
- Demonstrate understanding of basic sciences relevant to this specialty.
- Identify important determinants in a case (eg. Social, economic, environmental) and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of specialty / competence and to refer them to proper specialist or ask for help.
- Advise regarding the management (including interventional radiology) of the case and to carry out the management effectively.
- Update oneself by self-study and by attending courses, seminars, conferences and workshop which are relevant to the field of Radio-Diagnosis.
- Carry out guided research with the aim of publishing his/ her work and presenting work at various scientific fora.
  
- *Psychomotor Domain (Skills)*
- Take a proper clinical history, examine the patient, perform essential diagnostic/ interventional procedures and interpret the results to come to a reasonable diagnosis or differential diagnosis in the condition.
- Provide basic life saving support service in emergency situations
- Undertake complete patient monitoring including the care of the patient
  
- *Attitudinal Domain*
- Adopt ethical principles in all aspects of his/ her practice. Professional honesty and integrity to be fostered.
- Develop communication skills in order to explain the various options available in management and to obtain a true informed consent from the patient.
- Be humble and accept the limitations of his knowledge and skills and to ask for help from colleagues / seniors when needed.
- Respect patient rights and privileges including patient's right to information and right to seek a second opinion.
- *Specific:*
  - The induction programme is intended to give the new trainees a general idea about SVIMS, the nature of work done in various departments and the location of various departments within SVIMS. The HoD will introduce and guide the new students to various facilities listed below.
  
- Conventional Radiography and Special investigations.
- Ultra sound and Doppler.
- Ultra sound guided procedures.
- CT Scanning, Angiography reconstructions, CT guided procedures.
- M.R.I.
- Mammography
- Digital subtraction angiography

## II. REGULATIONS

- **Title of the programme :** The programme shall be called M.D (RADIO DIAGNOSIS)
- **Eligibility of admission :**
  - A candidate seeking admission into the course shall have MCI recognized M.B.B.S Qualification.
- **Duration of the Course :**
  - The duration of the course shall be three academic years including the period of examination
- **Syllabus :**
  - The Board of studies shall prepare and approve syllabus. Also it shall review the same periodically.
- **Admission:**
  - Based on an entrance examination(NEET-PG) to be conducted as per NMC/MCI norms.
- **Bond :**
  - After successful completion of the course, the candidate shall work as a Senior Resident or suitable post offered by the institute subject to availability of the vacancy and requirement of the institute as per the bond executed by the student.
- **Training Programme :**
  - The candidate joining the course must work as full time Resident during the period of Post Graduate Training.
  - To attend two CMEs - 1<sup>st</sup> year
  - To attend one Conference & one CME - 2<sup>nd</sup> year
  - To attend one conference & one CME - 3<sup>rd</sup> year
- **Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd

semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

- **Procedure for Discontinuation :**

After closure of the admissions, the student will not be permitted to discontinue studies, unless he/she fulfils the bond executed by him/her.

- **Attendance requirement for Admission to Examination:**

All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

- **District Residency Programme (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as "**District Residency Programme (DRP)**" and the postgraduate medical student undergoing training shall be termed as a "**District Resident**".

- **Plagiarism**

While submitting the thesis, the plagiarism clearance report to be attached as per the regulations of SVIMS university (for detailed regulations see the Annexure-II).

- **Teaching/Learning Methods :**

- Learning in MD (Radio diagnosis ) course shall essentially be under guidance.
- **Group teaching sessions:**
  - Journal review
  - Subject seminar presentation
  - Group discussion
  - Clinical case presentations pertaining Radio diagnosis/case presentation in interdepartmental sessions
  - Participation in CME programmes and conferences

- Tumour board participation

### **Posting Schedule**

- **I year**

- Dark room techniques, plain radiography & special investigations- 04 months
- Ultra sonography - 02 months
- Doppler - 02 months
- CT - 02 months
- MRI - 01 month
- Other departmental posting 01 month ( nuclear medicine)

- **II year**

- Conventional Radiology & special investigations 01 months
- Ultra sonography - 02 months
- Doppler - 02 months
- CT - 02 months
- MRI - 02 months
- District residency programme- 3 months

- **III year**

- Conventional Radiology & Special Investigations - 02 months
- Internal peripheral posting ( DSA) - 01 month
- Ultra sound - 02 months
- Doppler - 02 months
- CT - 03 months
- MRI - 02 months

- **Maintenance of Log Book :**

- Each candidate should maintain a log book in which the following details will be entered. The log book shall be verified and signed by the concerned posting faculty once in a month as per the NMC/MCI norms.

- Presentation in departmental seminars.
- Cases presented in clinical meetings.
- Presentations in journal clubs along with Title, Journal and Issue
- Schedule of intradepartmental rotation
- Details of peripheral postings
- To attend Conferences/CME (Radiology related subjects) - To allot 50 credit hours. For poster/ paper presentation-Doubling of credit hours.
- Papers presented at conferences with title name of the conference, date of presentation

- Paper published with title, name and issue of the journal.
- *Maintenance of log book and verification at the end of posting by modality incharge is mandatory.*

#### Teaching Schedule :

- Journal club once in a week 8 am to 9 am
- Seminar once in a week 8 am to 9am
- Neuro meet once in a week 8 am to 9 am
- Uro meet once in a week 8 am to 9 am
- Tumour board once in a week 8 am to 9 am
- Case presentation once in a week 3 to 4 pm
- Research forum once in a week 8 am to 9 am
- Gastro meet once in Fortnight
- Chest meet once in Fortnight
- Endo meet once in Fortnight
- Spotters Every last Friday for I year
- Spotters Every last Wednesday II year
- Spotter Every last Monday III year
- PG Doctor should take classes for under graduates & BSc Radiology students for 20 hours.
- Collection of 10 worked up cases by each PG during III years

#### M D thesis schedule

- **First Two months** Decision of thesis topics and review of literature
  - 15 days Synopsis of thesis & Proforma submission
  - One month Review of Literature
- Modification of master chart
  - Two years Data collection
- **After Two years** Results and Analysis
  - Sept 15 Submission of final version of thesis
  - Oct 15 Submission to university
  - Nov 15 Submission to journal

#### Leaves Permitted:

- **Casual Leaves :** Permitted
- **Special Casual Leave to attend C.M.Es and Conferences:** 15 days during entire course.
- **I year :** 02 CMEs
- **II year:** 01 CME and 01 conference with oral presentations (or) poster presentation
- **III year:** 01 CME and 01 conference with oral presentations (or) poster presentation.

- **Maternity Leave:** Whoever avails maternity leave should give exam after fulfilling the attendance and other mandatory requirements as per NMC/ university guidelines .

### III. ASSESSMENT

#### **FORMATIVE ASSESSMENT:**

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

#### **General Principles:**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form. The results of formative assessment should be maintained in the student appraisal form itself and communicated in the same format to the Examination Section while applying for the Summative Examination.

- **Internal assessment and evaluation components:**
- Log book with details of duration of postings, skills performed with remarks of the teacher/faculty member
- The research work to be assessed or reviewed every six months
- Evaluation sheets for seminar and journal clubs - Grading is to be given as per NTR UHS and at the end of each year
- Time scheduling
- Overall performance
- MCQ examination in one system every month
- Internal examination (theory) at the end of every year



## II. SUMMATIVE ASSESSMENT:

**Summative Assessment** i.e., assessment at the end of training. The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 as amended from time to time.

### **Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three concerned examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The

requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

## **EXAMINATIONS:**

### **Format of the Examination:**

- The examination for MD in Radio diagnosis shall be held at the end of 3<sup>rd</sup> academic year.
- The examinations shall be organized to evaluate and certify candidate level of knowledge, skill and competence at the end of the training
- Postgraduate examinations, in any subject shall consist of Thesis , Theory Papers, and Clinical/Practical and Oral examinations.
- The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

### **1. Thesis:**

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

#### *Guide:*

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

#### *Co-guide:*

- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned. The number of co-guides should be limited to two.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.

- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II) six months before the Theory and Clinical / Practical examination
- For MD/ MS Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide can not be nominated as examiners for evaluation of thesis.

## 2. Theory:

There shall be four theory papers, each of 3 hours duration. All papers would consist of short answer questions (minimum 10) covering all aspects of the course.

- 4 Theory papers 100 marks for each paper. Total - 400 Marks

**Paper I:** Basic sciences related to Radiology (consists of Anatomy, Pathology, Basic and Radiation Physics, Imaging Techniques, and Film processing).

**Paper II:** Chest, CVS, CNS including Head & Neck, Eye, ENT, musculo-skeletal, pediatric radiology and Mammography.

**Paper III:** Abdominal Imaging including GI, GU, Hepatobiliary, endocrine and metabolic, Obstetrics and Gynaecology and Interventional radiology

**Paper IV:** Recent advances, nuclear medicine; Radiology related to clinical specialties

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.

- Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state.

- **Moderation of Question Papers :**

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

- **3. Clinical/Practical Examination :**

- Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- Practical examination for the subjects in Basic Medical Sciences shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/Laboratory studies and his ability to perform such studies as are relevant to his subject.
- The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.
- The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

- **i. Spotters for practical examination**

Each examiner will show 10 spotters.

- **ii. Specimen for practical examination**

a. Related to basic science, applied clinical science, Radiology, special and interventional procedures, dark room techniques.

b. **Clinical :** One long case - 40 Minutes  
Two short cases - 50 Minutes

iii. **Oral/Viva- Voce :** Shall be Conducted by all examiners

iv. **Marks for Practical/Clinical/Viva voce ( Total 300 marks)**

**Spotters : 40 marks**  
**Long case : 80 marks**  
**Two short cases : 70 marks**  
**Viva voce including specimens : 100 marks**

v. **Internal Assessment**

Log book : 10 Marks  
Theory exam  
Conferences  
Publications  
Interesting cases

- Students shall be evaluated after each posting and teaching schedule, they will be required to maintain a log book. Student will be assessed after each posting. It is desirable for the candidate to have articles published or accepted for publication in the indexed journals/and or presentation in National or Regional conference

#### **Marking System for the Examination :**

- The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
- Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
- Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

#### **Appointment of Examiners :**

1. There shall be panel of eight or more external examiners as advised by the Head of the department.
2. No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
3. As per MCI, the Teachers in a medical college or institution having a total of 8 years teaching experience out of which at least 4 years teaching experience as Assistant Professor with at least one research publication in indexed journals gained after obtaining postgraduate degree shall be recognized as post graduate teacher in broad specialties.
4. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .
5. The Controller of Examinations shall have the powers to appoint two external examiners from among the panel of examiners recommended by the HOD.
6. No. of Internal Examiners - Two (HoD and one eligible PG Teacher). If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
7. An examiner shall ordinarily be appointed for not more than two consecutive terms.
8. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

#### **IV. SYLLABUS**

##### **FIRST YEAR**

- **BASIC SCIENCES**
- **Pharmacology - 10 hrs.**
  - Pharmacology of intravenous contrast media - dose, uses, adverse reactions and management of adverse reactions. Ionic and non-ionic contrast media - advantages and disadvantages CT, MR and Ultrasound contrast agents. Pharmacology and properties of Isotope pharmaceutical

agents, tracers, dose, applications. Essential drugs in the management of adverse contrast reaction, dose application and route of administration.

- **Radiological Anatomy and Applied Embryology - 30 hrs**

- The candidate should be familiar with Radiological Anatomy and applied embryology of Gastro Intestinal Tract, Genito Urinary Tract, Central Nervous System, Cardio Vascular System, Skeletal System and Cranial Nerves. They should have the knowledge of the basic anatomy relevant to all common radiological investigations and cross sectional anatomy in the axial, coronal and sagittal planes and also in oblique planes.
- Planar and Radiological Anatomy of Head ( including Brain, Eye, Para nasal sinuses), Neck, Thorax, Heart, Abdomen, Pelvis and Musculoskeletal System. Gross Radiological Anatomy of Heart and major vessels, Gastro Intestinal Tract, Central Nervous System, Thorax, Genito Urinary System, Soft tissues, Endocrine organs.

- **RADIATION PHYSICS - 100 hrs**

- Basic physics of radioactivity, production of X-ray, interaction of X-ray with matter, effects of X-ray, measurements of X-ray quantity and principles and methods of radiation protection in Diagnostic Radiology.

- **Physics of Diagnostic Radiology**

- Structure of X-Ray tube and electrical circuit of x-ray unit
- Various types of X-Ray tubes, tube assembly and Tube rating.
- Production, effects and measurement of X-Rays.
- Interaction of X-Rays with matter.
- Image intensification.
- Conventional Fluoroscopy and IITV Systems.
- Physics and DSA
- Xeroradiography
- X-ray Radiography, Photofluorography, Angiography
- Physics of Radiographic Cassettes, Films and Intensifying Screens
- Conventional and Computerised Tomography
- Mammography ( including Digital Mammography)
- Image quality and factors controlling the same in conventional and modern techniques.
- Dark room techniques including Dark room Design.
- Factor's influencing the radiographic image and assurance of quality control in radiography.
- Various artefacts in Radiology and Imaging.
- Effects and control of scattered radiation
- Physics of Collimators, Filters and Grid.
- Physics of Bone Densitometry

- Image processing (Conventional-Manual and automatic)
- Image processing (Digital)
- Digital Radiography and Computer Radiography
- Physics of Ultrasonography
- MRI, MR Spectroscopy
- Physics of PET and SPECT
- Picture Archival and Communication System (PACS)
  
- **Radiation protection**
- Radiations hazards in Diagnostic Radiology
- Essential of radiobiology and biological effects of Radiation.
- Personal monitoring, Dosimeters, permissible dose, ICRP recommendation.
- Departmental protection – National and Intentional regulations.
- Radiation Protection for Radiology workers and for the general public.
- Planning and layout of Diagnostic Radiology Department.
- Basics of X-ray equipment installation, AERB regulations, radiation acceptance test.
- Radiation units and measurements
- Exposure – dose, dose equivalent.
- Dosimetric instruments: Ionisation Chamber Systems, GM counters, Scintillation Detectors, TLD and Photographic Dosimetry
- QA & Control system.
  
- **RADIOGRAPHY AND DARK ROOM PROCEDURES – 80 hrs**
- Lectures by the faculty members
- Models and specimen demonstration by the faculty members.
- Seminars, by students, supervised by the faculty members.
- Practicals to be trained under the supervision of the faculty members.
- Conventional Radiography including views of extremities, Spine, skull, PNS Abdomen, Thorax and pelvis.
- Special Radiographic Techniques like, Stress Views, Trauma Radiography, Axial and Oblique views.
- Contrast techniques of Gastro Intestinal System, Respiratory, Hepatobiliary System, Urogenital System, Central Nervous System, Cardio Vascular System, soft tissues and Salivary glands.
- Contrast techniques in other Systems.
  - Conventional Tomography
  - OPG and Dental Radiography
  - Magnification techniques, Portable Radiography
  - Chemistry of processing & dark room procedures
  - Dark room design

**BIOSTATISTICS, RESEARCH METHODOLOGY & EPIDEMIOLOGY-20 hours**



- Introduction to health research
- Formulating research question
- Literature review
- Measures of disease frequency
- Descriptive study designs
- Analytical study designs
- Experimental study designs: Clinical trials
- Validity of epidemiological studies
- Qualitative research methods: An overview
- Measurement of study variables
- Sampling methods
- Calculating sample size and power
- Selection of study population
- Study plan and project management
- Designing data collection tools
- Principles of data collection
- Data management
- Overview of data analysis
- Ethical framework for health research
- Conducting clinical trials
- Preparing a concept paper for research projects
- Elements of a protocol for research studies
- Publication Ethics

### SECOND YEAR

- **RESPIRATORY SYSTEM AND CHEST - 100 hrs**
- Normal chest, methods of examination
- Digital Radiography in Chest.
- High KV techniques
- Mediastinal and pleural disease.
- Inflammatory and interstitial disease of the Lung.
- Pneumothorax, Pneumomediastinum, Cystic disease of Lung
- Infections of Lung, Mediastinum, Pleura and Chest wall.
- Tumours of Lung, Pleura and Chest wall.
- Pulmonary thrombo-embolism
- Trauma and post operative chest.
- Paediatric chest including congenital conditions
- Radiology of Respiratory distress (New born, Child and Adult)

- Miscellaneous Lung conditions including pneumoconiosis, emphysema, chronic bronchitis, foreign bodies, Post Radiation, Post Chemotherapy, Drowning and Poisoning.

### **CARDIO VASCULAR SYSTEM - 60 hrs**

- Methods of examination.
- Normal Heart and Pulmonary circulation.
- Basic ECG, Cardiac Ultrasonography (Echocardiography).
- Congenial Heart Disease.
- Arteries, Aneurysms, Dissections and complications.
- Acquired Heart Diseases, Cardiac Scintigraphy
- Ischaemic Heart Diseases, Cardiomyopathy
- Cardiac Tumours including Myxoma, Rhabdomyoma.
- Pericardium-Pericardial infection, Effusion, Constrictive Pericarditis, Cardiac Tamponade.
- Pericardial Calcification.
- Arteriography, Venography and Lymphangiography
- Perfusion studies and MRI and CVS
- Radiology of Post-operative Chest, Pace Maker, Electrode and Prosthetic valve.

### **GASTRO INTESTINAL TRACT - 120 hrs**

- Methods of examination and interpretation of normal and diseases of pharynx, oesophagus
- Methods of examination and interpretation of normal and diseases of stomach, Small Bowel and Large bowel
- Methods of examinations and interoperation of normal appearance and disease of Hepatobiliary System, Spleen, Pancreas, Mesentery and Retro peritoneum
- Acute abdomen - investigations and interpretations
- Radiology of Post-operative Abdomen and organ transplantation ( Liver, Pancreas, etc.)
- Paediatric Gastrointestinal Radiology
- Abdominal Trauma.
- Tumour and Predisposing conditions
- Infections and inflammatory conditions.
- Ischaemic conditions of Bowel and Mesentery and role of arteriography and Doppler study.
- Endocrine Tumours and Venous Sampling
- Upper and lower GI bleeding and GI radiological investigations including Scintigraphy

- Radiological Interventions.

### **GENITO-URINARY SYSTEM - 60 hrs**

- Methods of invitation and normal appearances.
- Congenital lesions.
- Calculus and Inflammations involving Genito Urinary System.
- Infection and inflammations involving Genito Urinary System.
- Tumours of Genito Urinary System.
- Reno vascular disease and Radiological interventions.
- Renal failure & transplant kidney
- Miscellaneous including cystic disease of kidney, nephrocalcinosis, lower urinary tract obstruction/infection- and post-operative problems.
- Trauma of Genito-urinary tract.
- Male Infertility imaging and interventions.

### **ENDOCRINE SYSTEM - 30 hrs**

- Anatomy and basic physiology of various endocrine organs.
- Various imaging modalities (including Scintigraphy, PET, SPECT) and their interpretations.
- Imaging of Pituitary, Thyroid, Adrenal, Pancreas and other endocrine organs using various Radiological techniques.

## **THIRD YEAR**

### **SKELETAL SYSTEM - 60 hrs**

- Radiographic and other imaging modalities (like Isotope study including PET and SPECT, MRI, CT etc.)
- Structure of Bone, Bone formation, remodeling and growth.
- Congenital; skeletal anomalies and dysplasia.
- Bone and joint inflammation and infection - different types of arthritis
- Degenerative disorders.
- Neoplasm including lymphoid and haemopoietic disorders.
- Metabolic and endocrine disorders.
- Skeletal trauma.
- Bone and Marrow injury
- Avascular necrosis.
- Miscellaneous conditions - joint prosthesis, instruments - application imaging, Complications.
- Radio Frequency Ablation.

### **CENTRAL NERVOUS SYSTEM AND SKULL - 60 hrs**

- Methods of examination and normal appearance of Skull, Brain and Spine and the Spinal cord.
- Applied embryology related to CNS.
- Infections and Inflammatory conditions of CNS
- Tumours and Tumour like conditions of CNS, Skull base and Calvarium.
- White matter diseases.
- Radiology of Dementia and epilepsy
- Imaging in Hydrocephalus.
- Cranio-cerebral trauma.
- Congenital and degenerative lesions of Brain and Spinal cord.
- Disorders of Spine and Spinal cord.
- Cerebral Scintigraphy and its applications.
- Vascular lesions and interventions of CNS.
- Post-operative, Post Chemotherapy and Post Radiation Changes.

### **OBSTETRICS AND GYNAECOLOGY-50 hrs**

- Obstetrics imaging (Normal/ Abnormal).
- Gynaecological imaging (Normal/ Abnormal)
- Infertility imaging and interventions, including ART.
- Gestational Trophoblastic Tumours.
- Radiology of ambiguous genitalia and Hermaphroditism.
- Doppler study and IUGR.
- Radiological interventions in Gynaecology and Obstetrics.
- Miscellaneous conditions - Amniotic fluid embolism, Remnant Syndrome, Ovarian Hyperstimulation Syndrome etc.

### **ENT, EYE AND DENTAL IMAGING - 50 hrs**

- Normal appearance and anatomy of Orbit, Eye ball, PNS and Temporal bone.
- Disease involving Larynx, PNS, Orbits and Eyeball, Ear and Mastoids.
- Imaging and interpretation of teeth and jaws
- Dental Radiography.
- Pan tomography.
- Application of various imaging modalities like CT, MRI, and Isotope studies, PET, SPECT etc. in head and neck region.

### **SOFT TISSUES AND SMALL PARTS - 30 hrs**

- Various disease, imaging and interpretations related to soft tissues and small parts (including Thyroid, Testis and Breast)

- Mammography and Sonography - Techniques and interpretations.
- Soft tissue Radiography, Ultrasonography, Computerised Tomography and MRI.

#### **EMERGENCY RADIOLOGY - 30 hrs**

- Special Radiographic technique in acute trauma and life threatening situations.
- Skill for airway maintenance.
- Deciding appropriate optimal imaging in situations like acute abdomen and other emergency situations.

#### **SPECIAL TECHNIQUES - 80 hrs**

- Ultrasonography : physical principles, techniques and interpretation.
- Computed Tomography: physical principles, techniques and interpretation.
- Magnetic Resonance Imaging : physical principles, techniques and applications.
- Digital Subtraction Angiography: physical principles, techniques and applications.
- PET, SPECT: physical principles, techniques and interpretation.
- Nuclear medicine as applied to Diagnostic Radiology.
- Newer developments in Diagnostic Radiology and Imaging - like picture archival and communication system ( PACS)
- Filmless Radiology environment.
- Special Techniques and newer developments in Conventional Radiology, US, CT, MRI, PET, SPECT.

#### **INTERVENTIONAL RADIOLOGY - 60 hrs**

- Interventional Hepatobiliary procedures.
- Interventional Cardio-Vascular procedures.
- Interventional Genito-urinary procedures.
- Interventional Gynaecological and Obstetrics Procedures.
- Venous Sampling Techniques.
- Radio frequency Ablation Techniques
- Interventions in GIT.
- Other Ultrasonography and Computerised Tomography/MRI guided procedures
- Newer developments in interventional Radiology.

#### **TEACHING AND LEARNING METHODS IN RADIODIAGNOSIS**

- Lectures by the faculty members
- Models and specimen demonstration, by the faculty members.

- Seminars, by students, supervised by the faculty members
- Practicals to be trained under the supervision of the faculty members.

#### V. TEXTBOOKS AND JOURNALS RECOMMENDED

- Textbook of Radiology and imaging – by David Sutton
- Radiology: diagnosis, imaging, intervention – by Taveras and Ferruci.
- Alimentary Tract Radiology – by Alexander R. Margulis
- Text book of Gastrointestinal Radiology – by Richard M.Gore MD, MarcS.Levine MD
- Gringer and Allison’s Diagnostic Radiology - by Grainger and Allison.
- Text book of diagnostic imaging – by Charles E.Putman, Carl E.Ravin
- Clarks positioning in Radiology
- Merrill’s atlas of Radiographic positions and procedures
- Abram’s Angiography: Vascular and Interventional Radiology – by Herbert L Abrams, D Baum Stanley, Michael J Pentecost.
- Caffey’s Pediatric Diagnostic Imaging
- Interventional Radiology of the Abdomen – by Jesoph T.M. D. Ferrucci, Jack Wittenberg
- Taveras And Ferrucci’s Radiology – by Ferrucci, Charles B. Higgins, Joseph T. Ferrucci
- CT and a MR Imaging of the whole body – by John R, Haaga, Charles F. Lanzieri, Robert C. Gilkeson
- Diagnostic Neuroradiology : A text/ Atlas – by Anne G. Osborn
- Clinical ultrasound – by Cosgrove.
- Bone and Joint Imaging – by Donald Resnick
- Diagnosis of bone and joint disorders – 6 volumes – by Donald Resnick.
- Paediatric orthopaedic Radiology – by Ozonoff
- The Radiology of skeletal Disorders – by Murray and Jacobson.
- Medical Radiation Physics – by WJ Meredith
- The fundamentals of X-Ray and Radium Physics – by Joseph Selman.
- Diagnostic ultrasound – by Carol and Rumak, S.R.Wilson and J.W.Charboneau
- Imaging of new born, infant and young adult – by Leonard E Swischuck.
- Hand book of cardio vascular Magnetic Resonance Imaging – by Gerald M.Pohost, Krishna S. Nayak
- Neuroimaging – by William W orrisson
- Magnetic Resonance Imaging in orthopaedic and Sportsf Medicine – by David W Stoller
- Felson’s Principles of Chest Roentgenology – by Lawrence R. Goodman MD
- Clinical Urography – by Howard M.Pollak MD, Bruce L. Mc Clennan M
- Christensen’s Physics of Diagnostic Radiology – by Thomas S Curry, James E Dowdey, Robert E Murry.

#### BIOSTATICS, EPIDEMIOLOGY, RESEARCH METHODOLOGY

- Rothman and Greenland, Modern Epidemiology
- David Sackett, Epidemiology
- A.B. Hill, Medical Statistics

## **JOURNALS**

- American journal of Roentgenology (AJR).
- British Journal of Radiology.
- Seminars in Roentgenology
- Radiological Clinics of North America
- American Journal of Neuroradiology
- Indian journal of Radiology and Imaging.
- Clinical Radiology
- Radiographics
- Radiology
- Pediatric Radiology
- Pediatric Radiology Journal
- Acta Radiologica
- Journal of Clinical Ultrasound
- Ultrasound in Medicine and Biology
- Ultrasound International
- Ultrasound in Obstetrics and Gynecology
- Neuroradiology
- Skeletal Radiology ( The Journal of Skeletal Radiology)
- Clinical Imaging
- Seminars in ULTRA SOUND, CT AND MR.

**ANNEXURE-I**

**Postgraduate Students Appraisal Form**

**Pre / Para /Clinical Disciplines**

\*\*\*

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sl. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based/recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis/Research work										
7.	Log Book Maintenance										

**Publications**

**Yes/No**

**Remarks\***

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**\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

**SIGN.OF ASSESSEE**

**SIGN.OF FACULTY I/C**

**SIGN.OF HOD**



## PLAGIARISM

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**  
(A University established by an Act of A.P. State Legislature)

**GUIDELINES FOR 'PLAGIARISM' CHECK**  
**WHILE SUBMISSION OF THESIS/DISSERTATION BY**  
**DM/M.Ch/MD/MS/Ph.D students**

**Ref.: Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/MS/ DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for ThefRses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

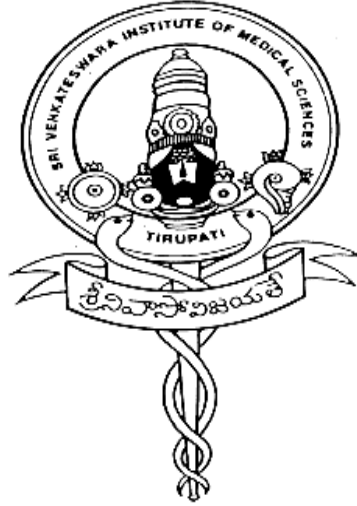
1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

###

# **SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES**

*(A University established by an Act of Andhra Pradesh Legislature)*

**TIRUPATI – 517 507**



## **LOG BOOK**

### **COMMON FOR MD/ MS/ DM/ M.Ch. POSTGRADUATES**

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

## PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From ...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :

*(Preferably be done by the faculty with whom the resident worked for most part of the period)*

### **Quality parameters being Assessed:**

1. Donor / Patient Evaluation
2. Academic Knowledge about Donor / Patient's Problems
3. Curiosity about unexplained Observations
4. Donor / Patient Care
5. Donor / Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

*Signature of the candidate*

*Signature of the guide*

*Signature of the HoD with seal*

**DETAILS OF POSTINGS OVER 3 YEARS**

**1st YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

*Signature of Faculty :*

**2nd YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

3rd YEAR From..... To.....

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

*Signature of Faculty:*

**Thesis Topic :**

**Guide :**

**Co-Guides :**

### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Journal Review Presentations:

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material, Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyze the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**CASES PRESENTED IN MORTALITY CONFERENCE**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LAB / INVASIVE PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>



### CONFERENCES ATTENDED

S. No.	Name	Role	Signature of supervising Faculty

### PUBLICATIONS

S. No.	Topic	Journal	Role

### BEDSIDE CASE DISCUSSION

S. No.	Date	Diagnosis	Signature of Faculty Presented to

## SUMMARY OF LOG BOOK

*(To be filled at the end of the course & retained in this book)*

Name of the student : Admn. No.  
Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_  
Name of the Institute:

- 1) No. of Journal Review Presentations : Presented ..... Attended .....
- 2) No. of Seminar Presentations : Presented ..... Attended .....
- 3) No. of Clinical Presentations : Presented ..... Attended .....
- 4) No. of Case Presentations : Presented ..... Attended .....
- 5) No. of UG Teaching Programmes : Conducted ..... Attended .....  
(Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
- 6) No. of PG Teaching Programmes : Attended
- 7) No. of Investigative Procedures : Performed ..... Assisted..... Observed...
- 8) No. of Major Operations / : Performed  
..... Assisted..... Observed...  
Procedures /  
Experiments
- 9) No. of Minor Operations / : Performed  
..... Assisted..... Observed...  
Procedures /  
Experiments
- 10) No. of Emergencies : Performed  
..... Assisted..... Observed...
- 11) No. of Medico-legal work : Performed  
..... Assisted..... Observed...
- 12) No. of Public Health Visit /  
Social work /  
Survey /  
Immunization /  
Camps
- 13) No. of Clinico-Pathological Conference: Presented ..... Attended.....
- 14) No. of special investigation / : Conducted ..... Attended .....
- Procedure
- 15) No. of events attended Conferences..... Symposia .....  
Workshops ..... CME .....
- 16) Any other activities :

*Signature of the candidate*

*Signature of the guide*

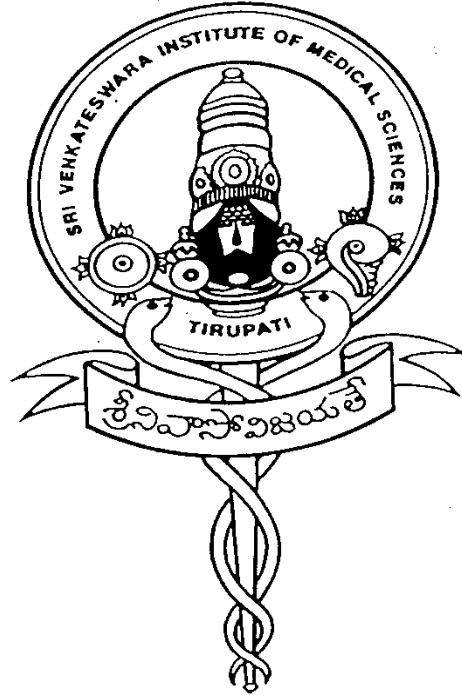
*Signature of the HoD with  
seal*

--o0o--

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI – 517 507**



**M.D. - ANAESTHESIOLOGY  
COMMON BOARD OF STUDIES MEETING**

***Dt.: 21.07.2021***

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**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUAPATI**

**M.D. (ANAESTHESIOLOGY)**

**COMMON BOARD OF STUDIES MEETING ON 21.07.2021**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**

**M.D (ANAESTHESIOLOGY)**

**COMMON BOARD OF STUDIES MEETING ON 21.07.2021**

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**GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING  
PROGRAMME FOR M.D., IN ANAESTHESIOLOGY**

(As prescribed by MCI, 2018)

**I. PREAMBLE**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. The goals are

1. A post graduate specialist having undergone the required training in anaesthesiology should be able to recognize the health needs of the community.
2. He or she should be competent to handle effectively medical problems and should be aware of the recent advances pertaining to his/her specialty.
3. She/he should be highly competent anaesthesiologist with broad range of skills that will enable him/her to practice anaesthesiology independently.
4. He or she should be competent to manage critically ill patients in emergency and ICU requiring routine to advanced monitoring, mechanical ventilation and other interventions.
5. The PG student should also acquire the basic skills in teaching of medical/para-medical/ Allied health sciences students.
6. She/he is also expected to know the principles of research methodology and modes of consulting library.
7. She/he should attend conferences, workshops and CMEs regularly to upgrade his/her knowledge.
8. Demonstrate aptitude and will to remain clear headed and act correctly when faced with critical incidence in the operating room and critical care units.
9. Demonstrate the knowledge of ethics and medico legal aspects related to the practice of anaesthesiology and critical care.
10. She / he should have dedication to the specialty, to patients under his care, to the institution and be able to work as a team with surgeons, nursing staff, hospital administration and with other clinicians, understanding, adjusting and instructing where necessary with a balanced mind and leadership qualities.

**II. REGULATIONS:**

- a) **Eligibility for admission:** A candidate seeking admission into the course shall have MCI / NMC recognized MBBS qualification.
- b) **Admission:** In order to be **eligible** for admission to any postgraduate course in a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in '**National Eligibility-cum- Entrance Test for Postgraduate courses**' held for the said academic year.
- c) **All the students should get their degree registered with AP state medical council before completion of first semester.**

**d) Duration of the course:** The duration of the course shall be three calendar years (including the period of examination).

**e) Bond:**

i) The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/- value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. **5,00,000/- (Rupees Five Lakhs only)** along with the full stipend amount received by him/her back to the Institute.

ii) The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.20,00,000 (Rupees Twenty lakhs only).

**f) Training Programme:** The candidate joining the course must work as full time Resident during the period of Post Graduate Training.

**Note:** In-Service candidate will not be paid stipend if He / She draws leave salary in that parent institution.

**g) External training:** The residents are permitted for external posting during the training period on payment of stipend for a period not exceeding one month as per the need and on recommendation of the HoD. The request for such training shall be submitted to the Dean, SVIMS through proper channel, two months in advance in order to process with the institution where the posting is required. The expenditure towards travel, accommodation and fees shall be borne by the individual.

**g) Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

**h) Attendance:** All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80%

(Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

**i) DISTRICT RESIDENCY PROGRAMME (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as “**District Residency Programme (DRP)**” and the postgraduate medical student undergoing training shall be termed as a “**District Resident**”.

**III. SUBJECT SPECIFIC OBJECTIVES**

1. **Theoretical knowledge:** A student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to his speciality. He/she should acquire in-depth knowledge of his subject including recent advances. He should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.
2. **Clinical / Practical skills:** A student should be expert in good history taking, physical examination, providing basic life support and advanced cardiac life support, common procedures like FNAC, Biopsy, aspiration from serous cavities, lumbar puncture etc. He/she should be able to choose the required investigations.
3. **Research:** He/she should know the basic concepts of research methodology plan a research project and should know how to consult library. Basic knowledge of statistics is also required.

**IV. SUBJECT SPECIFIC COMPETENCIES**

The student during the training programme should acquire the following competencies:

**1. Cognitive domain**

- Demonstrate knowledge of Anatomy related to;
  - Diaphragm, upper and lower airway, heart and coronary circulation ,
  - Regional anaesthesia - field block, central neuraxial, blockade, block for acute pain states
  - Procedures like -Intramuscular injections, arterial and venous cannulations and



➤ Patient Positioning under anaesthesia

- Demonstrate knowledge of Physiology of various systems (respiratory, cardiovascular, hepatobiliary, renal, endocrine, pregnancy, haematological, neuromuscular, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP, central, autonomic and peripheral nervous systems, metabolic response to stress and trauma) in detail and translate its application in a problem solving manner.
- Demonstrate knowledge of Biochemistry relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.
- Demonstrate knowledge of commonly used drugs in anaesthesia practice (premedication, induction agents - intra-venous and inhalational, neuromuscular blocking agents and reversal of muscle relaxants) - general principles, concepts of pharmacokinetics and pharmacodynamics, drug interactions with the other drugs taken concomitantly by the patient and anaphylactoid reactions.
- Demonstrate knowledge of gas laws, medical gas supply system, fluidics, electricity, diathermy and oxygen therapy.
- Demonstrate knowledge of 'principles of physics' that govern functions of basic anaesthesia delivery equipment, airway devices - (laryngoscopes, airways etc), breathing systems and monitors, fiber optics, Lasers, Pacemakers and defibrillators, monitoring equipments (used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block), Sterilization of equipments, manufacture, filling and transport of gases and liquid oxygen. etc.
- Demonstrate knowledge of importance of pre-anaesthetic assessment and optimization of a patient; consisting of evaluation, interpretation of laboratory investigation as applied to the care of the patients in planning and conduct of general anaesthesia.
- Demonstrate knowledge of basic life support, advanced cardiac, trauma life support, and neonatal resuscitation according to latest guidelines.
- Demonstrate knowledge of principles of sterilization and universal precautions, selection, maintenance and sterilization of anaesthesia and related equipment, Infection control, cross contamination in OT and ICU.
- Immune response and anaesthesia.
- Describe the development and history of anaesthesia as a specialty with knowledge of important personalities who have contributed towards it.

- Demonstrate knowledge of principles of artificial ventilation, management of unconscious patients, oxygen therapy, shock- (pathophysiology and management) and various protocols related to Intensive Care Unit.
- Demonstrate knowledge of post-operative care in the post-anaesthesia recovery room, in terms of management of
  - Post-operative pain: various modalities
  - Nausea and vomiting
  - Identified emergencies and postoperative complications.
  - Special precautions to be taken in specific surgical patients.
- Demonstrate knowledge of acute pain management, chronic pain therapy & therapeutic nerve blocks, acupuncture, acupressure and other non-conventional methods of treatment.
- Describe documentation, medico-legal aspects of anaesthesia and concept of informed consent.
- Demonstrate knowledge of research methodology and basics of biostatistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.
- Demonstrate ability to interpret blood gas analysis and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
- Explain blood coagulation mechanism, and their disturbances, rational use of blood and blood components.
- Demonstrate knowledge pertaining to special anaesthetic techniques as relevant to:
  - Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
  - Associated medical disorders in surgical patients
  - Geriatric and pediatric anaesthesia, Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
  - Induced hypothermia, incidental, and environmental safety of patient.
  - Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
  - Principles of anaesthetic management of neuro/ cardiac/thoracic /vascular/ transplantation/burns and plastic surgery.
  - Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
  - Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator, Multiple organ failure

- Demonstrate knowledge pertaining to care of terminally ill, Hospices management, Do not resuscitate orders.
- Demonstrate knowledge of general principles of medical audit and Critical incident reporting.
- Demonstrate knowledge of Ethics and clinical trial.
- Demonstrate knowledge of Hospital, ICU and OT design and planning.
- Demonstrate knowledge of Medical education including evidence based medical education.
- Demonstrate knowledge of principles of human resources and material management.

## **2. Affective Domain:**

- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

## **3. Psychomotor domain**

At the end of the course, the student should acquire skills in the following broad areas and be able to:

- Demonstrate ability as a peri operative physician, in terms of
  - Acquiring mastery in careful and relevant history taking, physical examination in clinical evaluation of the patient preoperatively.
  - Collecting and synthesizing preoperative data from parent hospital and other sources and to develop a rational strategy for the peri-operative care of the patient.
  - Thorough and systematic approach to preoperative evaluation of patients with and without systemic diseases, undergoing different types of operations.
  - Prioritizing problems, present cases clearly and systematically to attending consultants.
  - Developing working relationships with consultants in other specialties to assist in preoperative evaluation and get a good consultation.

- Interacting with preoperative patients and developing effective counselling techniques for different anaesthetic techniques and peri-operative procedures.
  - Assessing and explaining risk of procedure and taking informed consent.
  - Managing information in preoperative evaluation and outcome enhancement and communication skill to patients and relatives.
  - Ability to choose and order the required investigations to be done in a particular patient peri operatively
- Demonstrate ability in performing
    - Pre-operative equipment check
    - selection of drugs
    - Preparation of work table etc.
- Identify conditions like difficult airway by following difficult airway algorithms.
  - Demonstrate ability to establish topical airway anaesthesia for awake intubation
  - Demonstrate management of a Failed intubation drill on a Mannequin according to latest guidelines
  - Demonstrate ability to monitor and assess depth of anaesthesia
  - Demonstrate abilities to manage body fluid composition; volume status; replacement of fluid and blood loss; use of whole blood and blood components.
  - Demonstrate abilities to manage Electrolyte and acid base derangements; osmolarity and osmolality.
  - Demonstrate acquisition of skills to initiate mechanical ventilation; select appropriate type and mode of ventilator; and monitor proper functioning of ventilator.
  - Identify the need to perform intra-operative laboratory tests, blood gases, coagulation profile and interpret the results with clinical co relation
  - Demonstrate ability to manage co-morbid conditions and anaesthesia
  - Demonstrate ability to perform cannulation of arteries, central and peripheral veins.
  - Demonstrate ability in using and interpreting the following routine non-invasive and invasive monitors intra-operatively:
    - Electrocardiogram with ST-segment analysis
    - Noninvasive blood pressure
    - Capnograph: values and changes in values and waveform.
    - Pulse oximetry: values and changes in values

- Neuromuscular blockade monitor
- Invasive arterial pressure: waveform and changes in the waveform
- Central venous pressure: values and waveform
- Pulmonary artery pressure: Values and waveforms, pulmonary capillary wedge tracing.
  - Cardiac output
  - Mixed venous oxygen saturation
  - Evoked potential
  - Transesophageal echocardiography: basic understanding
- Demonstrate skills in providing basic life support, advanced cardiac life support, trauma life support and paediatric-neonatal life support, train medical and paramedical staff in BLS and ALS.
- Demonstrate mastery in common procedures like vascular access, use of latest invasive and non-invasive monitoring equipment, lumbar puncture, management of appropriate mechanical ventilation and total care of Intensive Care Patient.
- Demonstrate ability to administer general anaesthesia and regional anaesthesia for ASA I to V, under supervision.
- Demonstrate ability to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision.
- Demonstrate ability to use ultrasound machine for giving blocks and venous cannulation.
- Demonstrate ability to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery, and for all major surgeries, able to manage critically ill patients and treat intractable pain.
- Demonstrate following abilities in **Emergency Anaesthesia, Trauma and Resuscitation:**
  - Organize resources in case of mass casualty.
  - Perform triage.
  - Assess, transport and manage mass casualties / disaster management and camp anaesthesia.
  - Manage massive haemorrhage and massive blood transfusion.
  - Transport critically ill patient.
  - Perform anaesthetic management of geriatric patients with fracture neck of femur
  - Manage severe burns patients, rapidly progressing spinal compression, massive haemoptysis and lobectomy, peritonitis from various suspected causes, preparation and management of bowel obstruction, septicaemic shock, acute upper airway obstruction such as foreign body, epiglottitis, infections, cardiac tamponade from examples

- post cardiac surgery, malignant pericardial effusion, peri-operative management of rupture aneurysm of abdominal aorta
- Basic Cardiac Life Support and Advanced Cardiac Life Support, Basic Trauma Life Support, Advanced Trauma Life Support, and Cerebral preservation.
  - Management of intra-operative cardiac arrest
  - Management of intra-operative bronchospasm
- Demonstrate ability to document a Medico-legal aspect.
  - Demonstrate ability to provide special sedation /anaesthesia requirements outside operating Room, eg Radiology: for CT, MRI (especially in relation to dye allergy and embolization, Oncho radiotherapy, Electroconvulsive shock therapy (modified ECT. Non-invasive cardio-radiologic procedures including balloon angioplasty and cardiac catheterization, Non-invasive neuro-radiologic procedures, lithotripsy etc .
  - Demonstrate ability to analyze data and write a thesis, present scientific data, participate in anaesthesia audit.
  - Demonstrate ability to critically review and acquire relevant knowledge from the journals about the new development in the specialty
  - Demonstrate following abilities in the **Post Anaesthesia Care Unit (PACU)/recovery room**
    - Assess the patient's recovery and condition for a safe discharge or transfer.
    - Observe, recognize and treat the commonly occurring problems likely to arise in the Post-anaesthesia Care Unit (PACU) especially those in relation to cardio-respiratory systems:
      - Airway integrity and compromise.
      - Arrhythmia
      - Hypertension
      - Hypotension
      - Pain prevention and pain relief
      - Nausea and vomiting
      - Decreased urine output
      - Emergence delirium
      - Delayed emergence from anaesthesia
      - Shivering
      - Post-obstructive pulmonary edema.
    - Assess patient recovery and the parameters for transfer from the PACU to the ward, ICU, home.
    - Score the patient's condition according to the Aldrete system, including fast tracking after out-patient surgery.

- Demonstration of following abilities in **Intensive Care Unit**
  - Understanding the spectrum of critical illnesses requiring admission to ICU.
  - Recognizing the critically ill patient who needs intensive care -Trauma, burns, all types of shock, Sepsis, SIRS and ARDS, Poisoning, infectious patient (HIV, Hepatitis) and patients with metabolic disturbances.
  - Monitoring progress of patients by physiological scoring systems
  - Practicing infection control practices and control of nosocomial infections.
  - Inserting central venous lines, arterial lines using ultrasound and interpreting the data.
  - Managing cardiovascular instability, respiratory failure and postoperative pulmonary complications
  - Understanding of the operation of mechanical ventilators including different ventilatory modalities non-invasive ventilation, complications and modes of weaning.
  - Principles and application of Oxygen Therapy
  - Glycaemia control in the critically ill patient
  - Practice of Hypothermia and prevention of cerebral injury after cardiac arrest
  - Delivering appropriate nutritional support - enteral and parenteral.
  - Proper use of sedative/hypnotic drugs in the ICU.
  - Practicing ethical and legal aspects of critical care
  - Good communication skills with patient and relatives.
  - Proper Sterilization of ICU equipment.
  
- Demonstration of following abilities in **Acute pain and Chronic Pain Management**
  - Assessment of patients with pain including: history taking, physical examination, and interpretation of investigations.
  - Classify types of pain - acute chronic, traumatic, cancer pain, etc. with the knowledge of Pain pathways in detail.
  - Practice the different modalities of physical therapy that may relieve both acute and chronic pain
  - Practice the acute pain, cancer pain guidelines and WHO treatment ladder.
  - Practice routes of administration and risk/benefits of drugs used for acute and chronic pain relief, patient controlled analgesia and treat the common pain syndromes.
  - Demonstrate practice of pain management in patients with problem drug use, drug dependency and addiction and identify the parameters for referral to a pain medicine specialist.

- Demonstrate Organization of acute pain service and role of acute pain nurse for pain assessment in various groups of patients, Physiological changes secondary to Pain, practice different modalities of pain control. Pharmacology and side effects of opioid analgesia and non-opioid analgesia, principle of patient-controlled analgesia and assessment of its efficacy, Pharmacology and side effects of epidural/intra-thecal opioid. Neurological assessment of epidural blockade and management of failed block. Management of regional blockade - brachial plexus, para-vertebral and intra-pleural block. Management of epidural abscess.
- Substance abuse and acute pain control. Pain control in concurrent medical diseases - COAD, IHD, bleeding tendency, geriatric. Pain control in burns patients. Pain control in trauma patients included multiple rib fracture
- Demonstration of abilities to manage Chronic Pain(Peripheral posting)
  - Practice different modalities of chronic pain management - physical therapy, psychotherapy, (including cognitive behavioural approaches), neuroablation, neuro-augmentation, spinal opioid, interventional neuro-blockade, non-opioid analgesia.
  - Anatomy, indication, technique and complication of chemical sympathectomy (lumbar sympathectomy, stellate ganglion block, celiac plexus block).( Peripheral posting)
  - Practice principles of management of cancer pain, principle of management of non-cancer neuropathic pain - phantom limb pain, post-herpetic neuralgia, complex regional pain syndrome, trigeminal neuralgia. Principle of management of non-cancer nociceptive pain - myofascial pain, lowerback pain, intractable angina, burns, chronic pancreatitis, PVD.
  - Practice Epidural steroid injection (all levels) and long-term epidural catheterization.
  - Observe and practice following blocks: Infra-orbital nerve, Intercostals nerve
  - Recognize complications associated with each blocks and know appropriate treatment of each
  - Know the indications for stimulation techniques such as transcutaneous electrical nerve stimulation (TENS), dorsal column stimulation, and deep brain stimulation. ( Peripheral posting)
  - Mechanisms and side effects of other therapies used for treating pain.
  - The principles of pain management in special patient groups including the elderly, children, disabled, intellectually handicapped and those unable to communicate.
  - Awareness of the principles for insertion and management of implantable drug delivery pumps. ( Peripheral posting)
  - Awareness of the basic principles of palliative care. ( Peripheral posting)
- Demonstrate practice of **Regional Anaesthesia**



- Applying general principles of pharmacology of local anaesthetics and various adjuvants.
  - Familiarizing with the relevant anatomy for regional techniques.
  - Application of indications and contraindications to regional anesthetic technique including central neuraxial blocks, peripheral nerve blocks and sympathetic nerve blocks.
  - Assessing adequacy of regional anaesthesia, and learn techniques of supplementation of inadequate blocks.
  - Providing effective anxiolytics and sedation of patients by both pharmacologic and interpersonal technique.
  - Performing the following regional anaesthesia techniques: Brachial plexus, cervical plexus\*, stellate ganglion block\*, lumbar plexus\*, lumbar sympathetic\*, Sciatic nerve block, Femoral nerve block, 3 in 1 block, Wrist block, Popliteal Nerve block, Trigeminal nerve block, Retro bulbar blocks\*, Paravertebral blocks, Intercostal blocks, Caudal block – adult and pediatric, Ankle block, Epidural block/Catheter, Subarachnoid block, Bier's block, All peripheral nerves of the upper and lower limbs. (\*Peripheral posting)
- Demonstrate practice of **Thoracic Anaesthesia**
    - Pre-operative assessment of patients undergoing Thoracotomy (lung resection), thoracoscopy, video assisted thoracoscopy and mediastinoscopy
    - Various approaches and their relevant equipments for lung isolation.
    - Various double lumen tubes and their placement.
    - Application of Principle of chest drain.
    - Respiratory Physiology and management of one lung ventilation (OLV). Indications, contraindications and hazards of OLV.
    - Application of the knowledge of Anatomy of lung and broncho-pulmonary segments.
    - Anatomy and techniques for intercostals nerve block and thoracic epidural. Management of thoracic epidural anaesthesia and analgesia
    - Anatomy, techniques and placement of paravertebral block/catheter.
    - Post-operative care of patients after lung surgery.
    - Peri-operative management of patients with myasthenia gravis.
    - Peri-operative management of patients with mediastinal mass.
    - Anaesthetic management of mediastinoscopy, major airway stenting.
    - Lung volume reduction surgery and problems.
  - Demonstrate practice of **Cardiovascular Anaesthesia:**

- Application of the knowledge of Anatomy and physiology of valvular disease, coronary arteries and their territories. Pulmonary circulation, coronary circulation, cerebral circulation, visceral circulation.
  - Application of the knowledge of Distribution of blood volume to different organs and systems and their control. Microcirculation. Venous system, venous pressure, its influence on various functions.
  - Regulation of blood pressure, hypotensive anaesthesia.
  - Anatomy and physiology of all operable congenital heart disease like ASD, VSD, PDA, TOF, transposition of great vessels\*. (\*Peripheral posting)
  - Application of the knowledge of anatomy and physiology of vascular heart disease like co-arcuation of aorta.
  - Assessment of cardiac patient with ischaemic heart, valvular heart disease and other diseases listed above. Understanding of cardiac catheterization, echocardiography, stress testing, and radio-nucleide imaging.
  - Application of Principle and complication of cardiopulmonary bypass
  - Application of Principle of trans-esophageal echocardiography
  - Application of Principle of circulatory support: inotropes, IABP, pacing
  - Coagulation and management of coagulopathy.
  - Off pump bypass
  - Intra-operative management of aortic surgery and major peripheral vascular surgery, aneurysm grafts, recanalisation procedures.
  - Understanding of the adult patient with congenital heart disease and their management during anaesthesia.
  - Postoperative cardiac critical care, including cardiovascular problems, analgesia.
  - Insertion of invasive monitoring for arterial monitoring, central venous pressure monitoring, pulmonary artery catheter insertion and interpretation.
  - Robotic cardiac surgery. ( Peripheral posting)
- Demonstrate practice of **Paediatric Anaesthesia**
    - Application of knowledge of Anatomical changes in paediatric patient and neonates.
    - Application of knowledge of Physiology and pharmacology in paediatric patient.
    - Guideline for pre-operative fasting in children and pre-medication.
    - Anaesthetic equipment: laryngoscopes, airways, endotracheal tubes, LMAs,
    - PLMA and breathing circuit for children.
    - Anaesthesia management for premature and newborn.

- Emotional problems for parent and child and principles of premedication. Consent by parents and their presence during induction. To become skilled in communicating with children, parents and other relatives.
- Problems of transporting a sick pediatric patient from the ward to the operating room and back with regard to temperature maintenance, cardiovascular stability, ventilation and oxygenation.
- Estimate preoperatively blood volume, hourly fluid requirements, fluid deficit, third space loss, acceptable blood loss and apply principles of fluid and blood replacement in the perioperative period.
- Induce and maintain anaesthesia by inhalation, intravenous, intramuscular and rectal routes and monitor pediatric patients.
- Understand the benefits, risks and techniques of regional anaesthesia in children. Anatomy and techniques of caudal, dorsal penile and inguinal regional block, spinal and epidural block
- Learn to recognize and treat post anaesthesia complications like apnea, laryngospasm, acid-base and electrolyte disturbances, febrile and convulsing child and bleeding child.
- Common problems related to common congenital syndromes presenting for surgery. Anaesthetic management of a child with concurrent disease – Down's, Pierre Robin syndrome, von Willebrand's disease, Goldenhar's, Sturge-Weber, Tracher-Colin, Prune-Belly, and cyanotic and non-cyanotic congenital heart disease.
- Paediatric resuscitation: drugs, doses and defibrillation of children of all ages, from the very premature neonates to those children with complex coexisting disease.
- Management of patients requiring paediatric intensive care, ventilatory management, and support of circulation. ( Peripheral posting)
- Resuscitation of neonates and children of all ages. A period of one to two months in a PICU is recommended for all post graduate students undergoing advanced training in paediatric anaesthesia.
- Paediatric pain management
- Assessment of a child with URTI, with a heart murmur.
  
- Management of fluid and electrolytes in children.
- Anaesthetic management of a malignant hyperthermia susceptible child.
- Anaesthetic management of FB bronchus, oesophagus, Wilm's tumour, congenital diaphragmatic hernia, tracheo-oesophagus fistula, thoracotomy.
- Anaesthesia for Fetal Surgery.

- Sedation techniques including the selection, management and monitoring of children for diagnostic and therapeutic procedures, with particular attention to working in areas outside the theatre suite.
- Demonstrate practice of **Transplant anaesthesia**( \*Peripheral posting)
  - Application of knowledge of basic pathophysiology of renal and liver failure\*. Principles of anesthetizing an immuno-compromised patient.
  - Principles of anesthetizing patient with end stage renal/liver disease and patient with organ transplantation. Perioperative management.
- Demonstrate practice of **Neuroanaesthesia**
  - Application of basic knowledge of cerebral circulation and intra cranial pressure and its implications
  - Anaesthesia to patients with neurologic disease, head injury undergoing neurologic or non-neurologic surgery and for diagnostic procedures requiring anaesthesia.
  - Anesthetic implications of the most common neurosurgical procedures, transnasal, trans-sphenoidal pituitary surgery. Posterior fossa surgery. Surgery for supratentorial pathology.
  - Application of basic concepts behind electrophysiologic monitoring of the brain and spinal cord.
  - Application of knowledge of general principles of positioning the patient for surgery and the advantages and disadvantages of each position.
  - Effects of anaesthesia on the electroencephalogram (EEG) and evoked potentials.
  - Differential diagnoses and treatment alternatives of intraoperative intracranial hypertension (“tight brain”)
  - Management of Head Trauma, and its anesthetic management and various protocols regarding their management and associated trauma.
  - Intracranial surgery and spinal surgery, both routine and emergency.
  - Monitoring: techniques for detection and management of air embolism.
  - Lumbar puncture and CSF drainage.
  - Non-surgical management of the head trauma patient, Systemic complications of severe brain injury.
  - Management of subarachnoid haemorrhage and vasospasm.
  - Diagnosis and management of patients with brainstem death; and dealing with patient’s relatives
- **Dental, Anesthesia**
  - Understand the principles of conscious sedation
  - Principles of anesthesia in a dental chair
  - Local Blocks for Dental Surgery
- **Ophthalmology**
  - Anesthetize for inlra and extra ocular surgery.

- To give-Monitored Anaesthesia Care.
- To give Ophthalmic nerve blocks.
- **ENT Posting**
  - To give topical anesthesia for awake intubation (nasal and oral)
  - To learn anesthetic problems related to common surgical procedures including thyroid surgery, MLS, laser surgery etc.
  - Learn to manage complications like post **tonsillectomy** bleeding.
- **Obstetric**
  - Learn the physiology of normal pregnancy, fetal and placental physiology effects of anesthesia on human uteroplacental blood flow, labor and delivery.
  - Understand perinatal pharmacology and placental transfer of drugs.
  - Learn all anesthetic techniques suitable for managing normal labor pain including regional anesthesia. Recognize and treat common problems related to continuous epidural.
  - Understand the advantages of regional and general anesthesia for cesarean section.
  - Know the risk factors, prevention, and treatment of maternal aspiration.
  - Recognize high-risk factors in obstetric patients and how they affect anesthetic management.
  - Recognize difficult airway and learn failed intubation drill.
  - Learn fetal monitoring techniques, assessment of a neonate and neonatal resuscitation.
- **Trauma & Resuscitation:** All residents must achieve proficiency in:
  - BCLS, ACLS, BTLS, ATLS, Cerebral preservation.
  - Triage, assessment, transport and management of mass casualties, disaster management.
  - Anesthetic considerations for trauma patients.
  - Documentation and medico legal aspects.
- **Anesthesia outside operating room**
  - Radiology: Special anesthetic considerations for CT, MRI especially in relation to dye allergy and embolization. Problems of patients undergoing radiotherapy.
  - Anesthesia for Electroconvulsive shock therapy (ECT)
  - Cardiac catheterization
- **Urology Service**
  - Anesthetic considerations for urological surgery, special considerations for TURP & lithotripsy.

- Demonstration of anesthetic abilities in the intraoperative period keeping into consideration the specific requirement of the surgical procedure - ENT, Orthopaedic, Gynaecology - Obstetrics, General surgery, Oncosurgery, replacement surgeries, urosurgery, vascular, plastic, Thoracic, Dental etc
- The following are special procedures which the post graduate student must be able to perform
  - Blind Nasal intubation
  - Failed intubation drill (includes Fiberoptic Laryngo/Bronchoscope)
  - Double Lumen Tube
  - Bronchial Blocker placement
  - Jet Ventilation
  - Suctioning and physiotherapy of wet lung
  - Intubation in Neonates
  - Initiation and management of ventilation
  - Combined Spinal Epidural
  - Brachial Plexus Block
  - Intravenous Regional Anaesthesia
  - Elbow, Wrist, Digital, Sciatic, Femoral, Lateral Cutaneous Nerve of thigh, Ankle - each
  - Cervical-Superficial and Deep, Stellate, Splanchnic - each( Peripheral posting)
  - Central Venous Line by Brachial, Jugular and Subclavian veins
  - Radial and Femoral Artery cannulation
  - CVP monitoring
  - Pulmonary Capillary Wedge Pressure
  - Neuro-muscular transmission Monitoring
  - Anaesthetic Depth eg. BIS monitoring

## **V. TIME FRAME FOR TRAINING THE PG STUDENTS:**

The student should be taught as per the following schedule to acquire the skills:

### **1. First 6 months:**

- During the first 6 months, the student should be taught expertise in the management of uncomplicated cases not belonging to any super specialty (ASA I and II cases). To start with, the student will observe and slowly become independent in giving general anaesthesia and spinal anaesthesia to ASA I and II cases for minor and major surgery, under graded supervision.
- The postgraduate student should learn the basic principles of safe and effective anaesthesia, resuscitation, and both the prevention and treatment of pain, perioperative care of the surgical patient, care of handling equipments, basic techniques in anaesthesia, and anaesthetic pharmacology, and electrical safety.
- He/she should select the thesis topic and submit the protocol for his thesis.

## **2. Next 18 months**

- The student should widen his experience and should be able to undertake anaesthetic care of all routine cases, assist in the anaesthetic care for routine obstetric practice, understand basic principles of critical care, pain management, and participate in audit.
- The student should be trained in administration of general anaesthesia and regional anaesthesia for ASA I to V under supervision. The student should be able to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision, and use of Ultrasound machine for giving blocks and venous cannulation. The student should learn paediatric and trauma life supports and maintain skills for basic and advanced cardiac life support.
- It is advised that they should be posted in the following specialties: general surgery including gastrointestinal surgery, transplant, ENT, Urology, Obstetrics, Dental Surgery, Eye, ICU, Pain Clinic and peripheral theatres like ECT, radio diagnostic and therapeutic procedures (CT scan, MRI scan, and angiography).
- The student should be able to analyze data and write a thesis. He/she should be able to present scientific data.

## **3. Last 12 months**

- Thesis should be submitted minimum of 6 months before the final MD examination.
- The post graduate student should be given experience of various super-specialties like cardiothoracic and vascular surgery, neurosurgery and transplantation, and paediatric surgery. The student should be able to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery, and for all major surgeries. The aim at the end is to be competent and independent soon after the third year of junior residency in providing anaesthesia to elective and emergency cases.
- The post graduate student should be able to manage critically ill patients and treat intractable pain. They should also know how to organize resources in case of mass casualty. The curriculum should be able to provide 04 months of elective Intensive Care Unit posting (2 months during initial years under supervision and 2 months independently in the last six months).

## **4. At the end of 3 years, the post graduate student should have the skills to:**

- Plan and conduct anaesthesia and provide post-operative care including pain relief for elective and emergency surgical procedures related to all surgical specialties.
  - Carry out basic life support (BLS) and advanced life support (ALS) and train medical and paramedical staff in BLS and ALS.
  - Manage patients admitted to an intensive care unit with the help of latest equipment.
  - Manage patients suffering from acute and chronic intractable pain(peripheral posting).
  - Organize the hospital environment to manage mass casualty situation and camp anaesthesia.
  - Critically review and acquire relevant knowledge from the journals about the new development in the specialty.
  - Should be able to participate in anaesthesia audit.
5. Overall the student should acquire skills in the following practical competencies: Information management in preoperative evaluation and outcome enhancement and communication skill to patient and relatives.

## **VI. SYLLABUS**

**The course content of 1<sup>st</sup> year covers the following:**

### **1. Anatomy related to:**

- Diaphragm, upper and lower airway
- Regional anaesthesia, field block, central neuraxial, blockade, block for acute pain states
- Intramuscular injections, arterial and venous cannulations and positioning.

### **2. Physics related to:**

- Anaesthesia machine - assembly of necessary items.
- Airway equipment including laryngoscopes, airway devices
- Breathing systems
- Monitoring in anaesthesia with concepts of minimum monitoring
- Gas laws, medical gas supply system
- Fluidics
- Electricity and diathermy
- Oxygen therapy

### **3. Physiology related to:**

- Theories of anaesthesia



- Respiratory, cardiovascular, hepatobiliary, renal and endocrine system, pregnancy, blood, muscle and N-M junction, Nerve impulse transmission, ECG, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP.
  - Central, autonomic and peripheral nervous systems.
  - Metabolic response to stress and trauma.
4. **Pharmacology related to**
    - General principles, concepts of pharmacokinetics and pharmacodynamics
    - Drug interactions in anaesthesiology, anaphylactoid reactions
    - Drugs used for premedication, induction of anaesthesia, general anaesthetics- intra-venous and inhalational, neuromuscular block and reversal of muscle relaxants.
  5. **Biochemistry** relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.
  6. Theoretical background of the commonly used anaesthetic techniques of general and regional anaesthesia, general principles of pre-anesthetic assessment and medication, recovery from anaesthesia and post operative care, effects of positioning during anaesthesia.
  7. Introduction to the operation theatre, post-anaesthesia care rooms
  8. Introduction to acute, chronic pain and pain management.
  9. Documentation and medico-legal aspects of anaesthesia. Defensive anaesthesia. Concept of informed consent.
  10. Resuscitation - basic and advanced life support (cardiac and trauma life support), neonatal resuscitation.
  11. Intensive care of critical patients with introduction to artificial ventilation, management of unconscious patients, oxygen therapy, shock - pathophysiology and management.
  12. Introduction to Research methodology, basics of biostatistics.

**The course content of 2<sup>nd</sup> year covers the following:**

Anatomy related to blocks for chronic pain, chemical neurolysis and different organ systems.

**1. Physics related to:**

- equipments used in anaesthesia monitors, ventilators, vaporizers,
- fibre optics
- Laser
- Pacemaker and defibrillator
- Monitoring equipment used for assessment of cardiac functions,

temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block.

- Sterilization of equipment
  - Computers in anaesthesia
2. Pharmacology of drugs used in cardiovascular, respiratory, endocrine, renal diseases and CNS disorders.
  3. Interpretation of blood gases and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
  4. Blood coagulation mechanism, disturbances, blood components.
  5. Special anaesthetic techniques as relevant to –
    - Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
    - Associated medical disorders in surgical patients
  6. Geriatric and pediatric anaesthesia
  7. Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
  8. Medical statistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.
  9. Care of terminally ill, Hospices management. Do not resuscitate orders.
  10. Postures and anaesthesia.
  11. Induced hypothermia, incidental, and environmental safety of patient.
  12. Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
  13. Third world anaesthesia.
  14. Inherited metabolic diseases and anaesthesia.

**The course contents of 3<sup>rd</sup> year cover the following:**

1. Principles of anaesthetic management of Neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
2. Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
3. Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator.
4. Multiple organ failure
5. Infection control, cross contamination in OT and ICU.
6. Immune response and anaesthesia.
7. Concept of cytokines, and other enzymes.

8. Selection, maintenance and sterilization of anaesthesia and related equipment
9. Chronic pain therapy and therapeutic nerve blocks.
10. Acupuncture, acupressure and other non-conventional methods of treatment.
11. Principles of neonatal resuscitation, ventilation and critical care.
12. Principles of human resources and material management.
13. General principles of medical audit. Critical incident reporting
14. Ethics and clinical trial.
15. Hospital, ICU and OT design and planning.
16. Medical education including evidence based medical education.

## **VII TEACHING AND LEARNING METHODS**

### **Post graduate training and teaching methodology**

1. Instead of didactic lectures arc; seminars, journal clubs, symposia, reviews and guest lecturers shall get priority for theoretical knowledge. Bedside teaching, grand rounds, interactive group discussions and clinical demonstrations shall be the hallmark of clinical /practical learning. Student shall have hand-on training in performing various procedures (medical /surgical concerning his subject) and ability to interpret various tests /investigations. Exposure to newer specialized diagnostic / therapeutic procedures concerning his subject shall be given.
2. A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
3. Log books shall be maintained regularly and should be checked and assessed periodically by the faculty members imparting the training.
4. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
5. Department should encourage e-learning activities.

### **Thesis: Supervision**

- The postgraduate is responsible to a Faculty member and the latter should be available to advise and assist the student in his clinical assignments
- A departmental teaching committee under the guidance of HOD will be responsible for the educational activities of the department and the teaching schedule.
- The postgraduates shall be put on roaster emergency duty as per schedule decided based on the work demand. The clinical work during emergency will have a close supervision by the on call faculty with a departmental hierarchy.
- Simulation based training in SVIMS Simulation System(skill lab) will be used for

events of high importance but infrequent occurrence and where there may be high risks to the patients

- Simulation based training will shall be used for both training and assessment of the candidate keeping in view of patient safety.

### PLAGIARISM

- While submitting the thesis, the plagiarism clearance report to be attached as per the regulations of SVIMS university (for detailed regulations see the Annexure -II details)

### Teaching Schedule

In addition to OR table teaching, in the department there are hourly sessions of formal teaching per week. The departments teaching schedule will be guided as follows

Journal club	20 times in a year
PG clinical case presentation and discussion	20 times in a year
Seminar on specific topics	Once a weak
University session (on various topic of intradepartmental interest including CPC and mortality meeting)	Once a month
Interim thesis presentation	Once in six months
Paramedical and Undergraduate teaching	Twice a month

### Rotation:

#### Schedule for three years of MD Anaesthesia postings:

The post graduate student shall be permitted to have exposure to the following areas within the hospital during the clinical anaesthesia practice:

1. Pre-anaesthesia clinic
2. Pain clinic
3. Recovery and Post anaesthesia Care Unit ( PACU )
4. Intensive Care Units
5. Dialysis and transplant
6. All specialty theatres
7. Induced hypotensive techniques
8. Induced hypothermia
9. Monitored anaesthesia care
10. Peripheral areas: Radiology, MRI, ECT and other interventional laboratories

Postgraduate Student is posted in various operation theatres to have adequate exposure of following different procedures and operations. The postings to various stations can be guided by the following schedule

Operation theatre	Months
General Surgery	3
Surgical GE	3

Urology	3
Ophthalmology	15 days
Otorhinology	2
Dental	15 days
Surgical Oncology	3
Orthopedics/Trauma/casualty	45d
Gynecology	3
Obstetrics	3
Pediatrics surgery	0
Burns/Plastic	15d
CTVS	2
Neurosurgery	2
ICU	2
Pain/PAC	2
Recovery	0
Organ Transplant posting in the other areas.	15d
(Radiology, Radiotherapy) ECT, Cardiac Cath)	15d

## VIII ASSESSMENT

- **Formative Assessment, during the training programme**

- Formative assessment will be continual and aims to assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system. The purpose of the assessment is to give regular feed back to the candidates about their performance and to prepare them for the final terminal examination by giving them exposure to the examination pattern. Formative assessment will not count towards pass/fail at the end of the program, but will provide feedback to the candidate
- **General Principles**
  - There will be at least FOUR internal assessments to cover all domains of learning including professionalism and communication skills. The Internal Assessment will be conducted in theory and clinical examination by the faculty assigned by the HOD. This would include theory examination (100 marks of three hours duration) containing 10 short structured question related to the topics covered during the preceding six months.
- **Quarterly assessment during the MD training should be based on:**
  - Journal based / recent advances learning
  - Patient based / Skill based learning
  - Self directed learning and teaching
  - Departmental and interdepartmental learning activity

- External and Outreach Activities / CMEs
- The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)

- **Summative Assessment (assessment at the end of training)**

The summative examination would be carried out as per the Rules given in Postgraduate Medical Education Regulations, 2000 amended from time to time.

The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

**Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three concerned examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

## IX EXAMINATION PATTERN

**The Post graduation final examination shall consists of three parts:**

- 1) Thesis
- 2) Theory evaluation
- 3) Practical/Clinical and Oral evaluation

### 1. Thesis

Every post graduate student shall carry out work on an assigned research project **under the guidance of a recognised Post Graduate Teacher**, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.
- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.

- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II) six months before the Theory and Clinical / Practical examination
- For MD/ MS Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

**2. Theory consists of four papers of 3 hours each having 10 short structured questions with 10 marks each:**

<b>Paper-1</b>	Basic Sciences as applied to Anaesthesiology
<b>Paper-2</b>	Practice of Anaesthesia: Anaesthesia in relation to associated systemic and medical diseases
<b>Paper-3</b>	Anaesthesia in relation to subspecialties/super specialties
<b>Paper-4</b>	Intensive Care Medicine, Critical care, Pain Medicine and Recent advances.

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.
- **Moderation of Question Papers :**

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;



1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

**Practical/Clinical Examination :**

- Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

**The Practical/Clinical Examination will consist of: 3 clinical cases,**

<b>One long case</b>	Duration:30 min (history, examination, Diagnosis and Management, Discussion)
<b>Two short case</b>	Duration:15 min each. In short cases only relevant history important to anaesthesia to be taken (history, clinical examination and diagnosis, discussion).

**Oral/Viva- Voce :**

The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

Oral/Viva-voce should be conducted preferably on four tables with one examiner on each table: Each table viva is allotted 25 marks (4 table x 25=100 marks). There shall be four examiners out of which minimum two examiners from outside the state and the rest of the two examiners from the institute / within or outside the state.

<b>Table-1</b>	ECG, X-rays, ABG Cards, Pulmonary function tests, Capnographs, clinical exercises card
<b>Table-2</b>	Anaesthetic Drugs, Emergency, Drugs, IV Fluids, Nerve Blocks (skeleton) .
<b>Table-3</b>	Anaesthesia machine including circuits and Vaporizers. ETT, Supraglottic Airway devices, ICU Ventilator and oxygen therapy equipment.
<b>Table-4</b>	Resuscitation equipments, resuscitation demonstration, Difficult Airway Equipment, monitoring equipments.

### **Alternatively, in exceptional situation**

1. One long case, viva voce at one station with all examiners, and: 150 marks
2. 28 OSCE station covering two stations of short cases, drugs ECG, X-rays, PFT, ABG, Respiratory loops, Resuscitation etc.,: 150 marks

The candidate should pass the theory & practical examination separately.

The external examiners will be offered one day extra to evaluate the theory papers in the central evaluation centre of SVIMS. Theory papers will be valued by all the examiners. Practical / Viva will be conducted during one day for a maximum of 8 candidates and for two days for a maximum of 16 candidates. If necessary it can be extended for the second day.

The division of awarded marks will be as follows

<b>Practical:</b>	Long case	=	100 marks
	Short cases	=	2 X 50marks= 100 marks
	Table Viva	=	4 X 25marks = 100 marks

### **Marking System for the Examination :**

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

### **Appointment of Examiners:**

1. No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
2. If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
3. An examiner shall ordinarily be appointed for not more than two consecutive terms.

4. The internal examiner in a subject shall not accept external examiner ship for a college from which external examiner is appointed in his subject.
5. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .

There shall be a panel of 8 External Examiner as advised by the HOD concerned. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

#### **Eligibility for appearing of university examination**

- 85% attendance during each academic term of 6 months,
- Online course in Basic Research Methods by the end of 2<sup>nd</sup> semester as per NMC norms
- One research observations accepted or sent for publication
- Candidate has to present at least one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies Thesis acceptance by all the three examiners
- Log book as per University format to be maintained

#### **Recommended Reading Books (latest edition)**

1. Lee's Synopsis of Anaesthesia
2. Clinical Anesthesiology by Morgan
3. Cardiac Anaesthesia By Joel Kaplan
4. Clinical Anaesthesia by Barash, Cullen and Stoelting
5. Textbook of Anaesthesia by Aitkenhead Rowbotham and Smith
6. Anaesthesia for neonates and infants by Smith
7. Pharmacology and Physiology for Anaesthetists by Stoelting
8. Miller's Anesthesia
9. Stoelting RK, Miller RD Basics of Anaesthesia
10. ICU Book, Paul Marino
11. Text Book of Critical Care, by Shoe maker
12. Regional Anaesthesia, P Prithviraj
13. Practical Management of Pain, Raj
14. Stoelting and Dierdorf: Anaesthesia and Co-existing Disease

15. Dorsch and Dorsch: Understanding Anaesthesia Equipments
16. ECG by Shamroth/Goldman
17. Anatomy for Anaesthetists by Harold Ellis
18. Clinical Anesthesia by P.G.Barash
19. Longneckers Anaesthesiology- Mcgraw Hill

**Must refer:**

1. Millers Anaesthesia
2. Cucchiara and Michenfelder: Clinical Neuroanaesthesia
3. Cottrell and Smith: Anaesthesia and Neurosurgery
4. Complications in Anaesthesiology by Orkin
5. Complications in Anaesthesia by Raven
6. Airway management by JL Benumof
7. Obstetric Anaesthesia by Chestnut

**Journals**

- 03 international Journals and 02 national (all indexed) journals

## **X Annexure - I**

### **Postgraduate Students Appraisal Form M.D. (Anaesthesiology and Critical Care)**

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based/recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis/Research work				
7.	Log Book Maintenance				

Publications Yes/ No

Remarks\* \_\_\_\_\_  
\_\_\_\_\_

**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD

## **XI. Annexure - II**

### **PLAGIARISM**

#### **SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**

(A University established by an Act of A.P. State Legislature)

##### **GUIDELINES FOR 'PLAGIARISM' CHECK**

##### **WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D students**

**Ref.:Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/MS/ DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for Theses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

#### **1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

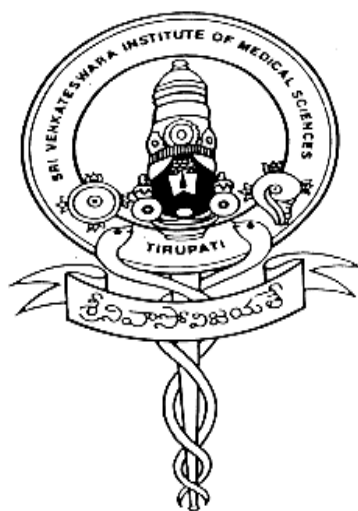
####

# **LOG BOOK**

## **SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,**

*(A University established by an Act of Andhra Pradesh Legislature)*

**TIRUPATI – 517 507**



# **LOG BOOK**

## **COMMON FOR MD/ MS/ DM/ M.Ch. POSTGRADUATES**

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

## PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From ...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :

*(Preferably be done by the faculty with whom the resident worked for most part of the period)*

### **Quality parameters being Assessed:**

1. Donor / Patient Evaluation
2. Academic Knowledge about Donor / Patient's Problems
3. Curiosity about unexplained Observations
4. Donor / Patient Care
5. Donor / Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

*Signature of the candidate*

*Signature of the guide*

*Signature of the HoD with seal*



**DETAILS OF POSTINGS OVER 3 YEARS**

**1st YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

*Signature of Faculty :*

**2nd YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

**3rd YEAR** From..... To.....

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

*Signature of Faculty:*

**Thesis Topic :**

**Guide :**

**Co-Guides :**

### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Journal Review Presentations:

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material, Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyze the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### CASES PRESENTED IN MORTALITY CONFERENCE

S. No.	Topic	Signature of supervising Faculty

### LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED

S. No.	Topic	Signature of supervising Faculty

### LAB / INVASIVE PROCEDURES PERFORMED

S. No.	Date	Procedures	Complications if Any	Signature of supervising Faculty

### CONFERENCES ATTENDED

S. No.	Name	Role	Signature of supervising Faculty

### PUBLICATIONS

S. No.	Topic	Journal	Role

### BEDSIDE CASE DISCUSSION

S. No.	Date	Diagnosis	Signature of Faculty Presented to

## SUMMARY OF LOG BOOK

*(To be filled at the end of the course & retained in this book)*

- Name of the student : Admn. No.
- Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_
- Name of the Institute:
- 1) No. of Journal Review Presentations : Presented ..... Attended .....
- 2) No. of Seminar Presentations : Presented ..... Attended .....
- 3) No. of Clinical Presentations : Presented ..... Attended .....
- 4) No. of Case Presentations : Presented ..... Attended .....
- 5) No. of UG Teaching Programmes : Conducted ..... Attended .....
- (Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
- 6) No. of PG Teaching Programmes : Attended
- 7) No. of Investigative Procedures : Performed .....Assisted.....Observed...
- 8) No. of Major Operations / : Performed .....Assisted.....Observed...
- Procedures /  
Experiments
- 9) No. of Minor Operations / : Performed .....Assisted.....Observed...
- Procedures /  
Experiments
- 10) No. of Emergencies : Performed .....Assisted.....Observed...
- 11) No. of Medico-legal work : Performed .....Assisted.....Observed...
- 12) No. of Public Health Visit /
- Social work /  
Survey /  
Immunization /  
Camps
- 13) No. of Clinico-Pathological Conference: Presented ..... Attended.....
- 14) No. of special investigation / : Conducted .....Attended .....
- Procedure
- 15) No. of events attended Conferences..... Symposia .....
- Workshops ..... CME .....
- 16) Any other activities :

*Signature of the candidate*

*Signature of the guide*

*Signature of the HoD with seal*

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI - 517 507**



**M.D. - MICROBIOLOGY**

**COMMON BOARD OF STUDIES MEETING**

**ON 21/07/2021**

---

**TIRUMALA TIRUPATI DEVASTHANAMS**



**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUAPATI**

**M.D. (MICROBIOLOGY)**

**COMMON BOARD OF STUDIES MEETING ON 21/07/2021**

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# SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES: TIRUPATI

## M.D (MICROBIOLOGY)

### COMMON BOARD OF STUDIES MEETING ON 21.07.2021

#### List of Members:

1. Dr B. Siddhartha Kumar - Chairman  
Dean, SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar, SVIMS, Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
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Professor,  
Dept. of Microbiology,  
SGMC&RF  
Thiruvananthapuram  
Kerala
5. Dr B. Venkata Ramana - Internal Expert  
Associate Professor & Head i/c,  
Dept. of Microbiology,  
SVIMS, Tirupati
6. Dr R. Jayaprada - Internal Expert  
Associate Professor,  
Dept. of Microbiology,  
SVIMS, Tirupati

# **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D., IN MICROBIOLOGY**

**(As prescribed by MCI, 2018)**

**\*\*\***

## **I. PREAMBLE**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The purpose of preparing these Guidelines is to standardize Microbiology teaching at Post Graduate level throughout the country so that it will achieve uniformity in undergraduate teaching as well.

This document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

**TITLE: M.D., MICROBIOLOGY**

**GOAL OF THE PROGRAM:** The goal is to have uniform standards in the teaching of Microbiology at Postgraduate level throughout the country. The guidelines will help achieving such standards which will in ensure availability of competent Microbiologist equipped with required knowledge and skills.

## II. AIM & OBJECTIVES OF THE PROGRAM

A post graduate student upon successfully qualifying in the MD (Microbiology) examination should be able to:

1. Demonstrate competence as a clinical microbiologist.
2. Interact effectively with the allied departments by rendering services in basic as well as advanced laboratory investigations.
3. Demonstrate application of microbiology in a variety of clinical settings to solve diagnostic and therapeutic problems along with preventive measures.
4. Play a pivotal role in hospital infection control, including formulation of antibiotic policy and management of biomedical waste.
5. Acquire skills in conducting collaborative research in the field of Microbiology and allied sciences.
6. Conduct such clinical/experimental research as would have significant bearing on human health and patient care.
7. Demonstrate effective communication skills required for the practice of clinical microbiology and while teaching undergraduate students.
8. Establish good clinical microbiological services in a hospital and in the community in the fields of bacteriology, virology, parasitology, immunology and mycology.
9. Plan, execute and evaluate teaching assignments in Medical Microbiology.
10. Plan, execute, analyze and present the research work in medical microbiology.
11. To acquire various skills for collaborative research.
12. To participate in various workshops/seminars/journal clubs/demonstration in the allied departments.
13. Uphold the prestige of the discipline amongst the fraternity of doctors.

### III. REGULATIONS

- a) **Eligibility for admission:** A candidate seeking admission into the course shall have MCI / NMC recognized MBBS qualification.
- b) **Admission:** In order to be **eligible** for admission to any postgraduate course in a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in 'National Eligibility-cum- Entrance Test for Postgraduate courses' held for the said academic year.
- c) **All the students should get their degree registered with AP state medical council before completion of first semester.**
- d) **Duration of the course:** The duration of the course shall be three calendar years (including the period of examination).
- e) **Bond:**
- i) The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/-value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. **5,00,000/- (Rupees Five Lakhs only)** along with the full stipend amount received by him/her back to the Institute.
  - ii) The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.20,00,000 (Rupees Twenty lakhs only).
- f) **Training Programme:** The candidate joining the course must work as full time Resident during the period of Post Graduate Training.
- Note:** In-Service candidate will not be paid stipend if He / She draws leave salary in that parent institution.

**g) External training:** The residents are permitted for external posting during the training period on payment of stipend for a period not exceeding one month as per the need and on recommendation of the HoD. The request for such training shall be submitted to the Dean, SVIMS through proper channel, two months in advance in order to process with the institution where the posting is required. The expenditure towards travel, accommodation and fees shall be borne by the individual.

**h) Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

**i) Attendance:** All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

**PROGRAM CONTENT - KNOWLEDGE and COURSE CONTENT - SKILLS**  
**SUBJECT SPECIFIC COMPETENCIES**

**A) Cognitive Domain:**

At the end of the course, the student should have acquired knowledge in the following theoretical competencies:

**General Microbiology**

1. Important historical events and developments in microbiology
2. Basic as well as advanced knowledge in various microscopes and microscopic techniques used in diagnostic microbiology
3. Various bio-safety issues including physical and biological containment, universal containment, personal protective equipment for biological agents
4. Various isolation precautions including standard and transmission based precautions
5. In-depth knowledge about various method of Sterilization, disinfection and lyophilization
6. Nomenclature, classification and morphology of bacteria as well as other microorganisms
7. Various types and significance of normal flora of human body in health and disease states.
8. Requirements for growth and nutrition of bacteria along with bacterial metabolism
9. Various types and role of bacterial toxins and bacteriocins
10. Microbiology of air, milk, water as well as hospital environment
11. Various types of host-parasite relationship and their significance
12. Various antimicrobial agents and mechanisms drug resistance
13. Bacterial genetics, bacteriophages and molecular genetics relevant for medical microbiology
14. Applications of quality assurance, quality control in microbiology and accreditation of laboratories

## **Immunology**

1. Components of immune system, types of immunity (Innate, acquired, mucosal, humoral and cell mediated immunity) and immune response
2. Describes and identifies uses of various antigens, immunoglobulins (antibodies) and antigen and antibody reactions
3. Complement system and Cytokines
4. Various disorders like hypersensitivity, immunodeficiency and auto-immunity involving immune system
5. MHC complex, Immune tolerance, Transplantation and Tumor immunity
6. Various types, techniques, advances, and applications of vaccines and immunotherapy
7. Measurement of immunological parameters
8. Immunological techniques and their applications in diagnostic microbiology as well as research
9. Mechanisms and significance of immune-potential and immune-modulation

## **Systemic bacteriology**

1. Demonstrate knowledge and skills in various techniques for isolation and identification of bacteria
2. Demonstrate knowledge about epidemiology, morphology, biochemical properties, antigenic nature, pathogenesis, complications, laboratory diagnosis treatment and prevention of major bacterial pathogens of medical importance given below-
  - a. Gram positive cocci including Staphylococcus, Micrococcus, Streptococcus, anaerobic cocci etc.
  - b. Gram negative cocci including Neisseria, Branhamella, Moraxella etc.
  - c. Gram positive bacilli including Lactobacillus, Coryneform bacteria, Bacillus and aerobic bacilli, Actinomyces, Nocardia, Actinobacillus and other actinomycetales, Erysipelothrix, Listeria, Clostridium and other spore bearing anaerobic bacilli etc.
  - d. Gram negative bacilli including Vibrios, Aeromonas, Plesiomonas, Haemophilus, Bordetella, Brucella, Gardnerella, Pseudomonas and other non-fermenters, Pasteurella, Francisella, Bacteroides, Fusobacterium, Leptotrichia and other anaerobic gram negative bacilli etc.
  - e. Helicobacter, Campylobacter, Calymmatobacterium, Streptobacillus,



Spirillum and miscellaneous bacteria

- f. Enterobacteriaceae
- g. Mycobacteria
- h. Spirochaetes
- i. Chlamydia
- j. Mycoplasmatales; Mycoplasma, Ureaplasma, Acholeplasma and other Mycoplasmas.
- k. Rickettsiae, Coxiella, Bartonella etc.

## **Mycology**

1. Explain general characteristics including morphology, reproduction and classification of fungi
2. Demonstrate knowledge and skills for isolation and identification of fungi
3. Explain tissue reactions to fungi
4. Demonstrate knowledge about epidemiology, morphology, biochemical properties, antigenic nature, pathogenesis, complications, laboratory diagnosis treatment and prevention of major fungal pathogens of medical importance given below-
  - a. Yeasts and yeast like fungi including Candida, Cryptococcus, Malassezia, Trichosporon, Geotrichum, Saccharomyces etc.
  - b. Mycelial fungi including Aspergillus, Zygomycetes, Pseudallescheria, Fusarium, Piedra, other dematiaceous hyphomycetes and other hyalohyphomycetes etc.
  - c. Dimorphic fungi including Histoplasma, Blastomyces, Coccidioides, Paracoccidioides, Sporothrix, Penicillium marneffeii etc.
  - d. Dermatophytes
  - e. Fungi causing Mycetoma, Chromoblastomycosis, Occulomycosis and Otomycosis.
  - f. Pneumocystis jirovecii infection
  - g. Rhinosporidium seeberi and Lacazia loboi (formerly named Loboia loboi)
  - h. Pythium insidiosum
  - i. Prototheca
5. Able to identify laboratory contaminant fungi

6. Explain Mycetism and mycotoxicosis along with agents involved
7. Demonstrates knowledge about antifungal agents and perform in vitro antifungal susceptibility tests.

### **Virology**

1. Demonstrates knowledge about general properties, classification, morphology, virus replication and genetics of viruses
2. Explain pathogenesis of viral infections
3. Demonstrates knowledge about isolation and identification of viruses
4. Demonstrate knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of major DNA viruses of medical importance including Pox viruses, Herpes viruses, Adeno viruses, Hepadna virus, Papova viruses and Parvo viruses etc.
5. Demonstrate knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of major RNA viruses of medical importance including Entero viruses, Toga viruses, Flavi viruses, Orthomyxo viruses, Paramyxo viruses, Reoviruses, Rhabdo viruses, Arena viruses, Bunya viruses, Retro viruses, Filo viruses, Human Immunodeficiency Virus, Arbo viruses, Corona viruses, Calci viruses etc.
6. Demonstrate knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of major Hepatitis viruses
7. Demonstrate knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of unclassified viruses and slow viruses including prions
8. Demonstrate knowledge about viral vaccines and anti-viral drugs.

### **Parasitology**

1. Demonstrate knowledge about general characters, classification and methods of identification of parasites.
2. Demonstrate knowledge about epidemiology, morphology, antigenic nature,

lifecycle, pathogenesis, complications, laboratory diagnosis, treatment and prevention of Protozoan parasites of medical importance including Entamoeba, Free living amoebae, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium, Toxoplasma, Sarcocystis, Cryptosporidium, Microsporidium, Cyclospora Isospora, Babesia, Balantidium, etc.

3. Demonstrate knowledge about epidemiology, morphology, antigenic nature, life cycle, pathogenesis, complications, laboratory diagnosis, treatment and prevention of helminthes of medical importance including those belonging to Cestoda (Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Dipylidium, Multiceps etc.), Trematoda (Schistosomes, Fasciola, Fasciolopsis, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis etc.) and Nematoda (Trichiuris, Trichinella, Strongyloides, Ancylostoma, Necator, Ascaris, Toxocara, Enterobius, Filarial worms, Dracunculus etc. )
4. Demonstrate knowledge about common arthropods and other vectors viz. mosquito, sand fly, ticks, mite, cyclops, louse, myasis of medical importance.
5. Demonstrate knowledge about anti-parasitic vaccine and drugs.

### **Applied Microbiology**

1. Demonstrate knowledge about epidemiology of infectious diseases
2. Demonstrate knowledge about antimicrobial prophylaxis and therapy
3. Demonstrate knowledge about hospital acquired infections
4. Demonstrate knowledge about management of biomedical waste
5. Effectively investigate an infectious outbreak in hospital and community
6. Demonstrate knowledge about infections of various organs and systems of human body viz. respiratory tract infections, urinary tract infections, central nervous system infections, congenital infections, reproductive tract infections, gastrointestinal infections, hepatitis, pyrexia of unknown origin, infections of eye, ear and nose, septicaemia, endocarditis, haemorrhagic fever etc.
7. Demonstrate knowledge about opportunistic infections
8. Demonstrate knowledge about various sexually transmitted diseases
9. Demonstrate knowledge about principles, methods of preparation, administration and types of vaccines
10. Effectively use information technology (Computers) in microbiology
11. Demonstrate knowledge and applications of Automation in Microbiology

12. Demonstrate knowledge and applications about molecular techniques in the laboratory diagnosis of infectious diseases
13. Demonstrate knowledge in statistical analysis of microbiological data and research methodology
14. Demonstrate knowledge in animal and human ethics involved in microbiology
15. Demonstrate knowledge in safety in laboratory and Laboratory management

**B) Affective Domain:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopts ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and students for effective teaching.

**C) Psychomotor domain:**

1. Collection/transportation of specimens for microbiological investigations
2. Preparation, examination and interpretation of direct smears from clinical specimens
3. Plating of clinical specimens on media for isolation, purification, identification and quantification purposes.
4. Preparation of stains viz. Gram, Albert's, ZiehlNeelsen (ZN), Silver impregnation stain and special stains for capsule and spore etc.
5. Preparation and pouring of media like Nutrient agar, Blood Agar, Mac-Conkey agar, Sugars, Kligler iron agar/Triple sugar iron agar (TSI), Robertson's cooked meat broth, Lowenstein Jensens medium, Sabouraud's dextrose agar etc.
6. Preparation of reagents-oxidase, Kovac etc.
7. Quality control of media, reagents etc.
8. Operation of autoclave, hot air oven, filters like Seitz and membrane filters etc
9. Care and operation of microscopes

10. Washing and sterilization of glassware (including plugging and packing)
11. Care, maintenance and use of common laboratory equipments like autoclave, hot air oven, water bath, centrifuge, refrigerators, incubators etc.
12. Aseptic practices in laboratory and safety precautions. Selection of Personal Protective Equipment according to task and donning (gloves, mask, eye protection, gown etc).
13. Sterility tests
14. Identification of bacteria of medical importance up to species level (except anaerobes which could be up to generic level).
15. Techniques of anaerobiosis
16. Tests for Motility: hanging drop, Cragie's tube, dark ground microscopy for spirochaetes
17. Routine and Special tests - Catalase test, Oxidase test, slide and tube coagulasetests, niacin and catalase tests for Mycobacterium, bile solubility, chickcellagglutination, sheep cell haemolysis, satellitism, CAMP test, and other biochemical tests.
18. Preparation of antibiotic discs; performance of antimicrobial susceptibility testing eg. Kirby-Bauer, Stoke's method, Estimation of Minimal Inhibitory/Bactericidal concentrations by tube/plate dilution methods.
19. Tests for B-lactamase production.
20. Screening of gram negative isolates for ESBL and MBL
21. Screening of Staphylococci for Methicillin Resistance.
22. Screening of Enterococci for Vancomycin resistance.
23. Testing of disinfectants.
24. Quantitative analysis of urine by pour plate method and semi quantitative analysis by standard loop tests for finding significant bacteriuria
25. Disposal of contaminated materials like cultures
26. Disposal of infectious waste
27. Bacteriological tests for water, air and milk
28. Maintenance and preservation of bacterial cultures

## IV. TRAINING PROGRAMME

**Time frame to acquire Knowledge and skills:**

- **Knowledge :**

End of 1 <sup>st</sup> Year	End of 2 <sup>nd</sup> Year	End of 3 <sup>rd</sup> Year
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<b>GENERAL MICROBIOLOGY:</b>	<b>IMMUNOLOGY: Clinical</b>	<b>GENERAL MICROBIOLOGY &amp; IMMUNOLOGY:</b>
<ol style="list-style-type: none"> <li>1. History and Pioneers in Microbiology</li> <li>2. Microscopy</li> <li>3. Nomenclature and classification of microbes</li> <li>4. Morphology of bacteria and other micro-organisms</li> <li>5. Growth and Nutrition of bacteria</li> <li>6. Bacterial metabolism</li> <li>7. Sterilization and disinfection</li> <li>8. Culture media and culture methods</li> <li>9. Identification of bacteria</li> <li>10. Bacterial toxins</li> <li>11. Bacterial antagonism: Bacteriocins</li> <li>12. Bacterial genetics</li> <li>13. Gene cloning</li> <li>14. Antibacterial substances used in the treatment of infections and drug resistance in bacteria</li> <li>15. Bacterial ecology – Normal flora of human body, Hospital environment, Air, water and milk</li> </ol>	<ol style="list-style-type: none"> <li>1. Hypersensitivity</li> <li>2. Immunodeficiency</li> <li>3. Auto-immunity</li> <li>4. Immune tolerance</li> <li>5. Transplantation immunity</li> <li>6. Tumour immunity</li> <li>7. Immunoprophylaxis and immunotherapy</li> <li>8. Measurement of immunity</li> </ol>	<p style="text-align: center;"><b>All</b></p>



16. Host-parasite relationship		
<b>IMMUNOLOGY:</b> 1. Innate and acquired immunity 2. Antigens 3. Immunoglobulins 4. Antigen and antibody reactions 5. Complement system 6. The normal immune system: structure and function 7. Immune response	<b>SYSTEMATIC BACTERIOLOGY</b> 1. Streptococcus and Lactobacillus 2. Staphylococcus and Micrococcus 3. Pseudomonas 4. The Enterobacteriaceae 5. Mycobacteria 6. Corynebacterium and other Coryneform bacteria 7. Vibrios, Aeromonas, Plesiomonas, Campylobacter and spirillum 8. Neisseria, Branhamella and Moraxella 9. Haemophilus and Bordetella 10. Bacillus: the aerobic spore-bearing bacilli 11. Clostridium: the spore-bearing anaerobic bacilli 12. Non-sporing anaerobe 13. The Spirochaetes	<b>SYSTEMATIC BACTERIOLOGY (2<sup>nd</sup> year):</b> <b>Plus</b> 14. Actinomycetes, Nocardia and Actinobacillus 15. Erysipelothrix and Listeria 16. The Bacteroidaceae: Bacteroides, Fusobacterium and Leptotrichia 17. Chromobacterium, Flavobacterium, Acinetobacter and Alkaligenes 18. Pasteurella, Francisella 19. Brucella 20. Chlamydia 21. Rickettsiae 22. Mycoplasmatales: Mycoplasma, Ureaplasma and Achleplasma 23. Miscellaneous bacteria

<p><b>MICROBIOLOGY APPLIED TO TROPICAL MEDICINE AND RECENT ADVANCES</b></p> <ol style="list-style-type: none"> <li>1. Normal Microbial flora</li> <li>2. Epidemiology of infectious diseases</li> <li>3. Hospital acquired infections and Hospital waste disposal</li> <li>4. Bacteriology of water milk and air</li> </ol>	<p><b>VIROLOGY:</b></p> <ol style="list-style-type: none"> <li>1. The nature of viruses</li> <li>2. Classification of viruses</li> <li>3. Morphology: virus structure</li> <li>4. Virus replication</li> <li>5. The genetics of viruses</li> <li>6. The pathogenicity and lab diagnosis of viruses</li> <li>7. Epidemiology of viral infections</li> <li>8. Anti-viral drugs</li> <li>9. Bacteriophages</li> <li>10. Herpes viruses</li> <li>11. Paramyxoviruses</li> <li>12. Influenza virus</li> <li>13. Hepatitis viruses</li> <li>14. Rabies virus</li> <li>15. Human immunodeficiency viruses</li> </ol>	<p><b>VIROLOGY (2<sup>nd</sup> Year): plus</b></p> <ol style="list-style-type: none"> <li>1. Vaccines</li> <li>2. Pox viruses</li> <li>3. Vesicular viruses</li> <li>4. Toga viruses</li> <li>5. Bunya viruses</li> <li>6. Arena viruses</li> <li>7. Marburg and Ebola viruses</li> <li>8. Rubella virus</li> <li>9. Arbo viruses</li> <li>10. Respiratory diseases: Rhinoviruses, adenoviruses and corona viruses</li> <li>11. Enteroviruses; Polio, Echo and Coxsackie viruses</li> <li>12. Other enteric viruses</li> <li>13. Slow viruses</li> <li>14. Oncogenic viruses</li> <li>15. Teratogenic viruses</li> </ol>
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	<p><b>PARASITOLOGY:</b></p> <ol style="list-style-type: none"> <li>1. General Parasitology</li> <li>2. <b>Protozoan parasites of medical importance:</b> Entamoeba, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium</li> </ol>	<p><b>PARASITOLOGY (2<sup>nd</sup> Year): plus</b></p> <ol style="list-style-type: none"> <li>1. <b>Protozoan parasites of medical importance:</b>  Toxoplasma, Sarcocystis, Cryptosporidium, Babesia, Balantidium etc.</li> <li>2. <b>Helminthology:</b>  All those medically important helminthes belonging to Cestoda, Trematoda and Nematoda.</li> <li>3. <b>Cestodes:</b>  Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Dipylidium, Multiceps etc.</li> <li>4. <b>Trematodes:</b>  Schistosomes, Fasciola, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis etc.</li> <li>5. <b>Nematodes:</b>  Trichuris, Trichinella, Strongyloides, Ancylostoma, Necator, Ascaris, Toxocara, Enterobius, Filarial worms, Dracunculus, etc.</li> <li>6. <b>Ecto-parasites:</b>  Common arthropods and other vectors viz., Mosquito, Sand fly,</li> </ol>
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		Ticks, Mite, Cyclops
	<b>MYCOLOGY</b> 1. The morphology reproduction in fungi 2. Classification of fungi 3. Dermatophytes 4. Candida 5. aspergillus	<b>MYCOLOGY (2<sup>nd</sup> Year): plus</b> 1. Contaminant and opportunistic fungi 2. Fungi causing superficial mycoses 3. Fungi causing subcutaneous mycoses 4. Fungi causing systemic infections 5. Anti-mycotic agents

		<p><b>MICROBIOLOGY APPLIED TO TROPICAL MEDICINE AND RECENT ADVANCES</b></p> <ol style="list-style-type: none"> <li>1. Infections of various organs and systems of human body</li> <li>2. Molecular genetics as applicable to microbiology</li> <li>3. Vaccinology: principle, methods of preparation, administration of vaccines.</li> <li>4. Bio-terrorism</li> </ol> <p><b>ALLIED BASIC SCIENCES</b></p> <p><b>a). Biochemistry:</b></p> <p>Basic understanding of biochemistry as applied to immunological / molecular methods for study of microbial diseases and pathogenesis of infections.</p> <ol style="list-style-type: none"> <li>1. Protein purification and estimation</li> <li>2. Protein estimation</li> <li>3. Nucleic acid purification and characterization</li> <li>4. Agarose and polyacrylamidegel electrophoresis - principles</li> <li>5. Ultracentrifugation - principles</li> </ol>
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		<p>6. Column chromatography – principles</p> <p><b>b) Molecular Biology:</b> Basic knowledge as applicable to molecular diagnostics and molecular epidemiology.</p> <ol style="list-style-type: none"> <li>1. Recombinant DNA technology</li> <li>2. Southern, northern and western blotting</li> <li>3. DNA amplification techniques</li> <li>4. Diagnostic PCR, different methods of PCR product detection (liquid hybridization, ELISA)</li> <li>5. Genotyping of microbes and viruses</li> </ol> <p><b>c) Pathology: (as applied to Microbiology)</b></p> <p>Basic knowledge of</p> <ol style="list-style-type: none"> <li>1. Inflammation and repair</li> <li>2. Intercellular substances and reaction</li> <li>3. Pathological changes in the body in bacterial, viral, mycotic and parasitic infections</li> <li>4. Demonstration of pathogen in tissue section</li> </ol>
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- **Skills:**

<b>1<sup>st</sup> Year Residency-skills list</b>					
Area	Sr. No.	Procedure	Observed no.	Assisted no. / practice on dummy	Performed independently no. (under supervision)
General Microbiology	1.	Microscopy for unstained preparations / wet mount	5	5	10
	2.	Microscopy for stained preparation	5	5	10
	3.	Preparation of direct smears from clinical specimens	5	5	10
	4.	Hanging drop preparation	5	5	10
	5.	Washing, sterilization and packing of glassware	10 sessions	-	-
	6.	Infection control activities- environmental sampling	10	10	-
	7.	Identification of HAI	5	5	-
	8.	Calculation of HAI quality indicators	5	5	-
	9.	Bacteriology of water	5	5	-
	10.	Bacteriology of air	5	5	-
	11.	Antibiotic disc preparation	-	-	-
	12.	Handling of laboratory animal	-	-	-
	13.	Methods for preservation of bacteria	10	-	-
	14.	Maintenance of stock cultures	10	-	-
Staining	1.	Gram staining	10	20	30
	2.	Acid fast staining (Ziehl-Neelsen method)	10	20	30
	3.	Albert staining	5	10	10
	4.	Modified ZN staining for M.leprae	5	5	5
	5.	Modified ZN staining for Nocardia	5	5	5
	6.	IQC-staining	5	5	5
Media Preparation	1.	Preparations of stains	4	4	4



	2.	Preparation of reagents	10	10	10
	3.	Preparations, plugging, pouring & Quality Control (QC) of culture media	20	20	30
	4.	Operation & maintenance of autoclave	10	10	20
Bacteriology	1.	Specimen collection for Blood Culture	5	5	5
	2.	Inoculation of liquid & solid media	20	20	30
	3.	Identification test	20	20	30
	4.	Antimicrobial sensitivity testing- modified Kirby-bauer technique	10	20	30
	5.	IQC-Antibiotic disc potency	5	5	-
	6.	Operation of BacT/ALERT	5	10	20
	7.	Operation of Vitek 2 compact	5	10	20
	8.	Petroff's concentration technique	10	10	20
	9.	AFB culture & sensitivity	5	10	20
Mycology	1.	KOH wet mount	5	10	20
	2.	Germ tube test	5	10	20
	3.	Slide culture	5	10	20
	4.	Negative staining for fungus	5	5	5
	5.	LPCB mount	10	10	10
Parasitology	1.	Giemsa staining for thick & thin peripheral blood smear	5	-	-
	2.	Stool wet mount for R/M	10	20	30
	3.	Stool concentration techniques	5	10	5
	4.	Modified ZN staining for C.parvum	2	2	2
Serology / Immunology	1.	Phlebotomy & separation of serum	10	10	5
	2.	Operation & maintenance of mini-VIDAS	5	10	20

	3.	Operation & maintenance of ELISA reader & washer	5	10	-
		Performance of serological tests			
	1.	Latex agglutination test (RA, ASO)	10	20	30
	2.	RPR card test	10	20	30
	3.	Tube agglutination test	10	20	30
	4.	Gold conjugate rapid card test	10	20	30
	5.	ANA by IF	5	5	-
	6.	ANA by Immunoblot	5	5	-
	7.	IQC-serology	5	5	5

**2<sup>nd</sup> Year Residency-skills list**

Area	Sr. No.	Procedure	Observed no.	Assisted no. / practice on dummy	Performed independently no. (under supervision)
General Microbiology	1.	Microscopy for unstained preparations / wet mount	-	-	-
	2.	Microscopy for stained preparation	-	-	-
	3.	Preparation of direct smears from clinical specimens	-	-	-
	4.	Preparation of slit skin smear for lepra bacilli	5	5	5
	5.	Hanging drop preparation	-	-	10
	6.	Washing, sterilization and packing of glassware	05 sessions	-	-
	7.	Infection control activities- environmental sampling	-	10	10
	8.	Identification of HAI	-	5	5
	9.	Calculation of HAI quality indicators	-	5	5
	10.	Bacteriology of water	-	5	5
	11.	Bacteriology of air	-	5	5
	12.	Antibiotic disc preparation	05 lots	-	-
	13.	Handling of laboratory animal	-	-	-

	14.	Methods for preservation of bacteria	-	5	10
	15.	Maintenance of stock cultures	-	5	10
Staining	1.	Gram staining	-	-	30
	2.	Acid fast staining (Ziehl-Neelsen method)	-	-	30
	3.	Albert staining	-	-	5
	4.	Modified ZN staining for M.leprae	-	-	5
	5.	Modified ZN staining for Nocardia	-	-	5
	6.	IQC-staining	-	-	5
Media Preparation	1.	Preparations of stains	-	-	5
	2.	Preparation of reagents	-	-	15
	3.	Preparations, plugging, pouring & Quality Control (QC) of culture media	-	-	50
	4.	Operation & maintenance of autoclave	-	-	20
Bacteriology	1.	Specimen collection for Blood Culture	-	-	5
	2.	Inoculation of liquid & solid media	-	-	30
	3.	Identification test	-	-	30
	4.	Antimicrobial sensitivity testing-modified Kirby-bauer technique	-	-	30
	5.	IQC-Antibiotic disc potency	-	5	5
	6.	Operation of BacT/ALERT	-	-	20
	7.	Operation of Vitek 2 compact	-	-	20
	8.	Petroff's concentration technique	-	-	20
	9.	AFB culture & sensitivity	-	-	20

Mycology	1.	KOH wet mount	-	-	20
	2.	Germ tube test	-	-	20
	3.	Slide culture	-	-	20
	4.	Negative staining for fungus	-	-	5
	5.	LPCB mount	-	-	10
Parasitology	1.	Giemsa staining for thick & thin peripheral blood smear	-	10	-
	2.	Stool wet mount for R/M	-	-	30
	3.	Stool concentration techniques	-	-	5
	4.	Modified ZN staining for C.parvum	-	-	2
Serology / Immunology	1.	Phlebotomy & separation of serum	-	-	5
	2.	Operation & maintenance of mini-VIDAS	-	-	20
	3.	Operation & maintenance of ELISA reader & washer	-	-	20
		Performance of serological tests			
	1.	Latex agglutination test (RA, ASO, CRP)	-	-	30
	2.	RPR card test	-	-	30
	3.	Tube agglutination test	-	-	30
	4.	Gold conjugate rapid card test	-	-	30
	5.	ANA by IF	-	-	10
	6.	ANA by Immunoblot	-	-	10
7.	IQC-serology	-	-	5	

**3<sup>rd</sup> Year Residency-skills list**

Area	Sr. No.	Procedure	Observed no.	Assisted no. / practice on dummy	Performed independently no. (under supervision)
General Microbiology	1.	Microscopy for unstained preparations / wet mount	-	-	-
	2.	Microscopy for stained preparation	-	-	-
	3.	Preparation of slit skin smear for lepra bacilli	-	-	-
	4.	Hanging drop preparation	-	-	-
	5.	Washing, sterilization and packing of glassware	05 sessions	-	-
	6.	Infection control activities- environmental sampling	-	-	10
	7.	Identification of HAI	-	-	5
	8.	Calculation of HAI quality indicators	-	-	5
	9.	Bacteriology of water	-	-	5
	10.	Bacteriology of air	-	-	5
	11.	Antibiotic disc preparation	-	5 lots	2 lots
	12.	Handling of laboratory animal	-	-	10

	13.	Methods for preservation of bacteria	-	-	10
	14.	Maintenance of stock cultures	-	-	10
Staining	1.	Gram staining	-	-	30
	2.	Acid fast staining (Ziehl-Neelsen method)	-	-	30
	3.	Albert staining	-	-	5
	4.	Modified ZN staining for M.leprae	-	-	5
	5.	Modified ZN staining for Nocardia	-	-	5
	6.	IQC-staining	-	-	5
Media Preparation	1.	Preparations of stains	-	-	10
	2.	Preparation of reagents	-	-	15
	3.	Preparations, plugging, pouring & Quality Control (QC) of culture media	-	-	50
	4.	Operation & maintenance of autoclave	-	-	5
Bacteriology	1.	Specimen collection for Blood Culture	-	-	5
	2.	Inoculation of liquid & solid media	-	-	30
	3.	Identification test	-	-	30

	4.	Antimicrobial sensitivity testing-modified Kirby-bauer technique	-	-	30
	5.	IQC-Antibiotic disc potency	-	-	5
	6.	Operation of BacT/ALERT	-	-	20
	7.	Operation of Vitek 2 compact	-	-	20
	8.	Petroff's concentration technique	-	-	20
	9.	AFB culture & sensitivity	-	-	20
Mycology	1.	KOH wet mount	-	-	20
	2.	Germ tube test	-	-	20
	3.	Slide culture	-	-	20
	4.	Negative staining for fungus	-	-	5
	5.	LPCB mount	-	-	10
Parasitology	1.	Giemsa staining for thick & thin peripheral blood smear	-	-	-
	2.	Stool wet mount for R/M	-	-	30
	3.	Stool concentration techniques	-	-	5
	4.	Modified ZN staining for C.parvum	-	-	2
Serology / Immunology	1.	Phlebotomy & separation of serum	-	-	5



	2.	Operation & maintenance of mini-VIDAS	-	-	20
	3.	Operation & maintenance of ELISA reader & washer	-	-	20
		<b>Performance of serological tests</b>			
	1.	Latex agglutination test (RA, ASO, CRP)	-	-	30
	2.	RPR card test	-	-	30
	3.	Tube agglutination test	-	-	30
	4.	Gold conjugate rapid card test	-	-	30
	5.	ANA by IF	-	-	10
	6.	ANA by Immunoblot	-	-	10
	7.	IQC-serology	-	-	5

## V. TEACHING AND LEARNING METHODS

The training programme should be designed to enable the student to acquire a capacity to learn and investigate, to synthesize and integrate a set of facts and develop a faculty to reason. The curricular programme and scheduling of postings must provide the student with opportunities to achieve the above broad objectives. Much of the learning is to be accomplished by the student himself. Interactive discussions are to be preferred over didactic sessions. The student must blend as an integral part of the activities of an academic department that usually revolves around three equally important basic functions of teaching, research and service. As mentioned earlier, the emphasis recommended under a residency programme is of learning while serving/working.

### Post Graduate Training Programme Teaching Methodology

Based on the available facilities, the Department can prepare a list of post graduate experiments pertaining to basic and applied microbiology. Active learning should form the mainstay of post graduate training; there should be lectures for post graduates (at least 20 per year), along with seminars, symposia, group-discussions and Journal clubs. The post graduate students should regularly do the ward rounds

of various clinical departments and learn cases of interest for discussion with the clinical faculty. Each college should have a Medical Education Unit to generate teaching resource material for undergraduates and evolving of problem-solving modules.

**Rotation:**

**Postings to laboratories/assignments**

The three-year training programme for the MD degree may be arranged in the form of postings to different assignments/laboratories for specified periods as outlined below. The period of such assignments/postings is recommended for 35 months. Posting schedules may be modified depending on needs, feasibility and exigencies. For facilities not available in the parent institution as well as for additional knowledge and skill, extramural postings may be undertaken.

**Suggested schedule of rotation:**

Each candidate is posted to different sections on rotation. They should get acquainted with the basic microbiology for first three months. The next three months they are expected to submit a synopsis on dissertation topic that has been chosen by them.

**The posting schedule is given as follows**

**Within Department**

1. Bacteriology - 7 Months
2. Mycobacteriology - 3 Months
3. Serology/Immunology - 7 Months
4. Mycology - 3 Months
5. Virology - 3 Months
6. Parasitology - 3 Months
7. Media preparation - 4 Months

**Other Departments**

1. Clinical Pathology - 15 days
2. Clinical Biochemistry - 15 days
3. Skin & VD - 15 days
4. ICTC & RNTCP - 15 days

The students shall maintain a Log Book for the period of his/her postings to other departments Institutions and get the Certificate from the Departmental Head at the end of postings.

**Practical Training**

Practical training should be imparted by posting the students in various sub-(sections) as detailed in the intrinsic and extrinsic rotation. The student should be

actively involved in day to day working of all the sections. He/she should be trained under the guidance of teachers in all the aspects of Clinical Microbiology and applied aspects of laboratory medicine including collection and transport of specimens, receiving of samples, preparation of requisite reagents, chemicals, media and glassware, processing of specimens, performing required antimicrobial susceptibility testing and reporting on the specimens, interpretation of results, sterilization procedures, bio-safety precautions, infection control practices, maintenance of equipments, record keeping and quality control in Microbiology.

### **Skills & Performance**

The student should be given graded responsibility to enable learning by apprenticeship. The faculty throughout the year should assess performance of the student in skills. Area of improvement/remarks should be mentioned for the skill and student should be re-assessed for the skills which are not acquired. To go to the next level, it should be mandatory for the student to acquire lower level skills satisfactorily, i.e only on satisfactory completion of assisted/performed with assistance skills should the student be permitted to perform the skill independently.

### **Emergency Duty**

The student should be posted for managing emergency laboratory services in Microbiology. He/she should deal with all the emergency investigations in Microbiology.

### **DISTRICT RESIDENCY PROGRAMME (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as “**District Residency Programme (DRP)**” and the postgraduate medical student undergoing training shall be termed as a “**District Resident**”.

### **Communication and Attitudinal Skills**

Post-graduate student is expected to imbibe professional attributes of honesty, integrity, accountability, honor, humanism and excellence and demonstrate the same in the day-by-day conduct and dealings with the teacher, peers, the nursing and paramedical staff and most-importantly patients. To ensure that student is able to acquire these attributes, their personal conduct should be keenly observed by the teachers and student should be counselled as and when required. Personal attributes

of the student should be regularly assessed by peers, senior, and junior students and Head of the Unit/ In charge.

The following is a rough guideline to various teaching/learning activities that may be employed.

- Collection of specimens, smear examination, culture and sensitivity analysis
- Discussion during routine activities such as during signing out of cases.
- Presentation and work-up of cases including the identification of special stains and ancillary procedures needed.
- Clinico-microbiological conferences, active involvement with hospital infection control committee
- Intradepartmental and interdepartmental conferences related to case discussions.
- Conferences, Seminars, Continuing Medical Education (CME) Programme.
- Journal Club.
- Research Presentation and review of research work.
- A postgraduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- Participation in workshops, conferences and presentation of papers etc.
- Laboratory work.
- Use and maintenance of equipment.
- Maintenance of records. **Log books** should be maintained to record the work done which shall be checked and assessed periodically by the faculty members imparting the training.
- Postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- Department should encourage e-learning activities.

**During the training programme, patient safety is of paramount importance,**

therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.

Teaching methodology includes: (MCI)

1. **Didactic lectures**
2. **Seminar/journal club presentation (once a fortnight).**

Evaluation sheets may be incorporated for the purpose of assessment of presentations. The following points may be considered in the scheme for evaluation of presentations.

- Topic selection
- Completeness of presentation
- Clarity of presentation
- Understanding of the subject and ability to convey the same
- Whether relevant references have been consulted
- Ability to convey points in favor and against the subject under discussion
- Proper use of audio-visual aids o Ability to answer questions

3. **Case presentation, case work up, case handling/management (once a week)**

Each post graduate student in Microbiology presents an interesting case in clinical practice or in laboratory exercise of his or her choice

4. **Attending clinical grand rounds / clinic-pathological conference:** The post graduate students will encouraged to attend lectures and grand rounds offered by other clinical and basic science departments of the hospital.
5. **Attendance at Scientific meetings, CME programmes:** The post graduate students are expected to attend meetings related to Microbiology present papers/posters in these meetings.
6. **Quality performance meetings:** The post graduate students will attend meetings of hospital infection control committee, meetings to review HAI, and incidents, mortality meetings, audit related meetings.
7. **Paper/poster presentation:** A postgraduate student would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which will be published/accepted for publication/sent for publication during the period of

his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

8. **Teaching skills:** The postgraduate students will be required to participate in the teaching and training programme of undergraduate students and interns.
9. **A logbook:** will be maintained recording the duration of posting, the period of absence, if any, skills performed, and remarks if any by the teacher/faculty member. The logbook will also record journal clubs, seminars attended and partaken as well as undergraduate teaching activities the post graduate student has participated and will be signed by the faculty in charge
10. Department will encourage e-learning activities.

## **VI. RECOMMENDED READING**

### **Books (Latest edition)**

1. Forbes B, Sahm D, Weissfeld A Bailey and Scott's Diagnostic Microbiology, Mosby, St. Louis.
2. Koneman EW, Allen SD, Janda WM, Schreckenberger PC, Winn WC. Color Atlas and Textbook of Diagnostic Microbiology, J.B. Lippincott, Philadelphia.
3. Murray PR, Baron EJ, Pfaller MA, Tenover FC, Tenover FC. Manual of Clinical Microbiology, American Society for Microbiology.
4. Garcia LS, Bruckner DA. Diagnostic Medical Parasitology, American Society for Microbiology.
5. Wiedbrauk DL, Johnston SLG. Manual of Clinical Virology, New York, Raven Press.
6. Ivan Roitt, Essential Immunology
7. Topley & Wilsons Microbiology
8. Mackie & McCartney, Practical Medical Microbiology

### **Journals**

1. Indian Journal of Medical Microbiology (Indian)
2. Indian Journal of Pathology and Microbiology (Indian)
3. Indian Journal of Medical Research (Indian)
4. Infectious Diseases Clinics of N.A. (International)
5. Journal of Infectious Diseases (International)

6. Journal of Medical Microbiology (International)

## VII. ASSESSMENT

**FORMATIVE ASSESSMENT** i.e., during the training

Formative assessment will be continual and will assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

Thesis, Research work
Soft skills, Attitude, Ethics and Communication

Internal Assessment will cover all domains of learning and will be used to provide feedback to improve learning; it will also cover professionalism and communication skills. The Internal Assessment will be conducted in theory and practical examination.

**Quarterly Assessment during the MD training programme will be based on:**

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities /CMEs

**The student will be assessed periodically as per categories listed in postgraduate student appraisal form**

## VIII. POSTGRADUATE STUDENT APPRAISAL FORM

### Pre / Para / Clinical Disciplines

Name of the Department / Unit : \_\_\_\_\_  
 Name of the PG Student : \_\_\_\_\_  
 Period of Training : From \_\_\_\_\_ To \_\_\_\_\_

Sr. No	Particulars	Not Satisfactory			Satisfactory			More than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2	Patient based / Laboratory or Skill based learning										
3	Self directed learning and teaching										
4	Departmental and interdepartmental learning activity										
5	External and Outreach Activities / CMEs										
6	Thesis / Research work										
7	Log Book Maintenance										

Publications Yes / No

Remarks\* \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\*Remarks: Any significant positive or negative attributes of postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

Signature of Assessee

Signature of Consultant

Signature of HOD



## IX. SUMMATIVE ASSESSMENT

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000** as amended from time to time. The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

### **Eligibility :**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfill attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination , by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

**The post-graduate examinations should be in three parts:**

**1. Thesis**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.

The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.

After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.

The student should submit 4 copies of the thesis along with one soft copy in CD/DVD **along with plagiarism clearance report (as per university regulations)** six months before the Theory and Clinical / Practical examination

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and practical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

**The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.**

## **2. Theory Examination**

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% marks cumulatively in all the four papers and 50% marks in 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D. shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

**There shall be four theory papers, each of 3 hours duration:**

<b>Paper I:</b>	General Microbiology and Immunology
<b>Paper II:</b>	Systematic Bacteriology
<b>Paper III:</b>	Virology Parasitology and Mycology
<b>Paper IV:</b>	Applied Microbiology and Recent advances

The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.

Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.

The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.

### **Moderation of Question Papers :**

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

## Practical and Oral/viva voce Examination

### SCHEME OF EXAMINATIONS

#### Final Theory Examination at the end of THIRD YEAR

Paper	Title of Paper	Theory marks	Practical marks
	<b>Theory</b>		
1	General Microbiology and Immunology	100	-
2	Systematic Bacteriology	100	-
3	Virology Parasitology and Mycology	100	-
4	Applied Microbiology and Recent advances	100	-
	<b>Practicals &amp; Viva</b>	-	300
	Total	400	300
	<b>Grand Total</b>	<b>700</b>	

Paper	QUESTION PAPER PATTERN FOR THEORY EXAMINATIONS	MARKS
1	10 short answer questions x10 = 100 marks	100
2	10 short answer questions x10 = 100 marks	100
3	10 short answer questions x10 = 100 marks	100
4	10 short answer questions x10 = 100 marks	100
	<b>TOTAL</b>	<b>400</b>

## X. PRACTICAL/CLINICAL EXAMINATIONS

**Practical examination** will be conducted for two days include the following components as mentioned in the revised MCI curriculum:

Practical examination for the subjects in Basic Medical Sciences shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/Laboratory studies and his ability to perform such studies as are relevant to his subject.

The components shall be as specified in the subject BOS.

**Oral/Viva- Voce :** The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

### SCHEME OF MD (MICROBIOLOGY) PRACTICALS - MARKS DISTRIBUTION

(No. of days for practical exam: 2 days) 2019-20 Batch

PRACTICALS								GRAND TOTAL
DAY 1					DAY 2			
Exercise1	Exercise 2	Exercise 3	Exercise 4	Exercise 5	Exercise 6	Exercise 7	Pedagogy & VIVA	
50 marks	40 marks	25 marks	25 marks	25 marks	25 marks	10 marks	100 marks	300

<b>Exercise 1</b>	Isolation and Identification of Bacteria from Clinical Samples
<b>Exercise 2</b>	Identification of a pure culture.
<b>Exercise 3</b>	<ul style="list-style-type: none"> <li>• <b>Serology:</b> Common Serological Tests like ELISA/VDRL/Widal/Brucella Agglutination test etc.</li> </ul>

Exercise 4	<ul style="list-style-type: none"> <li>• <b>Virology:</b> <ol style="list-style-type: none"> <li>1. Preparation of tissue cultures</li> <li>2. Virus Titration</li> <li>3. Haemagglutination and its inhibition test</li> <li>4. Virus Neutralization Test</li> <li>5. Other rapid tests for diagnosis of viral infections</li> </ol> </li> </ul>
Exercise 5	<ul style="list-style-type: none"> <li>• <b>Mycology</b> <ol style="list-style-type: none"> <li>1. Identification of fungal cultures</li> <li>2. Slide culture techniques</li> </ol> </li> </ul>
Exercise 6	<ul style="list-style-type: none"> <li>• <b>Parasitology</b> <ol style="list-style-type: none"> <li>1. Processing and Identification of ova and cysts in stool samples</li> <li>2. Amoebic Serology</li> <li>3. Microscopic Slides</li> <li>4. Examination of histopathology slides for parasites</li> </ol> </li> </ul>
Exercise 7	<ul style="list-style-type: none"> <li>• <b>Spotters</b></li> </ul>
Oral/Viva-Voce Examination:	This must include a component of teaching session of not more than 15 minutes duration.

**Pass Minimum:**

**\*40% of marks in each theory paper in University Examinations and not less than 50% of marks cumulatively in all the four papers in the University Theory examinations in the aggregate → 200/400.**

**\*50% of marks in the University Practical, Oral and Pedagogy Examinations  
→150/300**

**\*50% aggregate in Theory, Practical, Viva Examinations → 350/700**

**\*Thesis (Pre-condition to appear for the final University Examination)**

**- Accepted**

## XI. SYLLABUS FOR EACH PAPER

### **Paper I: General Microbiology**

1. History of microbiology
2. Microscopy
3. Bio-safety including universal containment, personal protective equipment for biological agents
4. Physical and biological containment
5. Isolation precautions including standard precautions and transmission based precautions
6. Sterilization, disinfection and lyophilization
7. Morphology of bacteria and other microorganisms
8. Nomenclature and classification of microorganisms
9. Normal flora of human body
10. Growth and nutrition of bacteria
11. Bacterial metabolism
12. Bacterial toxins
13. Bacteriocins
14. Microbiology of hospital environment
15. Microbiology of air, milk and water
16. Host-parasite relationship
17. Antimicrobial agents and mechanisms drug resistance
18. Bacterial genetics and bacteriophages
19. Molecular genetics relevant for medical microbiology
20. Quality assurance and quality control in microbiology
21. Accreditation of laboratories

### **Immunology**

1. Components of immune system
2. Innate and acquired immunity
3. Cells involved in immune response
4. Antigens
5. Immunoglobulins

6. Mucosal immunity
7. Complement
8. Antigen and antibody reactions
9. Hypersensitivity
10. Cell mediated immunity
11. Cytokines
12. Immunodeficiency
13. Auto-immunity
14. Immune tolerance
15. MHC complex
16. Transplantation immunity
17. Tumor immunity
18. Vaccines and immunotherapy
19. Measurement of immunological parameters
20. Immunological techniques
21. Immunopotential and immunomodulation

**Paper II: Systematic bacteriology**

1. Isolation and identification of bacteria
2. Gram positive cocci of medical importance including Staphylococcus, Micrococcus, Streptococcus, anaerobic cocci etc.
3. Gram negative cocci of medical importance including Neisseria, Branhamella, Moraxella etc.
4. Gram positive bacilli of medical importance including Lactobacillus, Coryneform organisms, Bacillus and aerobic bacilli, Actinomyces, Nocardia, Actinobacillus and other actinomycetales, Erysipelothrix, Listeria, Clostridium and other spore bearing anaerobic bacilli etc.
5. Gram negative bacilli of medical importance including Vibrios, Aeromonas, Plesiomonas, Haemophilus, Bordetella, Brucella, Gardnerella, Pseudomonas and other non-fermenters, Pasteurella, Francisella, Bacteroides, Fusobacterium, Leptotrichia and other anaerobic gram negative bacilli etc.
6. Helicobacter, Campylobacter, Calymmatobacterium, Streptobacillus, Spirillum and miscellaneous bacteria
7. Enterobacteriaceae



8. Mycobacteria
9. Spirochaetes
10. Chlamydia
11. Mycoplasmatales; Mycoplasma, Ureaplasma, Acholeplasma and other Mycoplasmas.
12. Rickettsiae, Coxiella, Bartonella etc.

### **Mycology**

1. General characteristics and classification of fungi
2. Morphology and reproduction of fungi
3. Isolation and identification of fungi
4. Tissue reactions to fungi
5. Yeasts and yeast like fungi of medical importance including Candida, Cryptococcus, Malassezia, Trichosporon, Geotrichum, Saccharomyces etc.
6. Mycelial fungi of medical importance including Aspergillus, Zygomycetes, Pseudallescheria, Fusarium, Piedra, other dematiaceous hyphomycetes and other hyalohyphomycetes etc.
7. Dimorphic fungi including Histoplasma, Blastomyces, Coccidioides, Paracoccidioides, Sporothrix, Penicillium marneffeii etc.
8. Dermatophytes
9. Fungi causing Mycetoma, Chromoblastomycosis, Occulomycosis and Otomycosis.
10. Pythium insidiosum
11. Prototheca
12. Pneumocystis jirovecii infection
13. Rhinosporidium seeberi and Lacazia loboi (Loboaloboi)
14. Laboratory contaminant fungi
15. Mycetism and mycotoxicosis
16. Antifungal agents and in vitro antifungal susceptibility tests.

### **Paper III: Virology**

1. General properties of viruses
2. Classification of viruses

3. Morphology: Virus structure
4. Virus replication
5. Isolation and identification of viruses
6. Pathogenesis of viral infections
7. Genetics of viruses
8. DNA viruses of medical importance including Pox viruses, Herpes viruses, Adenoviruses, Hepadna virus, Papova and Parvo viruses etc.
9. RNA viruses of medical importance including Enteroviruses, Toga viruses, Flaviviruses, Orthomyxo viruses, Paramyxo viruses, Reo viruses, Rhabdo viruses, Arena viruses, Bunya viruses, Retro viruses, Filo viruses, Human immunodeficiency virus, Arbo viruses, Corona viruses, Calci viruses etc.
10. Slow viruses including prions
11. Unclassified viruses
12. Hepatitis viruses
13. Virioids, prions
14. Vaccines and anti-viral drugs.

### **Parasitology**

1. General characters and classification of parasites.
2. Methods of identification of parasites
3. Protozoan parasites of medical importance including Entamoeba, Free living amoebae, Giardia, Trichomonas, Leishmania, Trypanosoma, Plasmodium, Toxoplasma, Sarcocystis, Cryptosporidium, Microsporidium, Cyclospora Isospora, Babesia, Balantidium, etc.
4. Helminthology of medical importance including those belonging to Cestoda (Diphyllobothrium, Taenia, Echinococcus, Hymenolepis, Dipyllidium, Multiceps etc.), Trematoda (Schistosomes, Fasciola, Fasciolopsis, Gastrodiscoides, Paragonimus, Clonorchis, Opisthorchis etc.) and Nematoda (etc. )
5. Entomology: common arthropods and other vectors viz. mosquito, sand fly, ticks, mite, cyclops, louse, myasis.
6. Anti-parasitic agents.

### **Paper IV: Applied Microbiology**

1. Epidemiology of infectious diseases

2. Antimicrobial prophylaxis and therapy
3. Hospital acquired infections
4. Management of biomedical waste
5. Investigation of an infectious outbreak in hospital and community
6. Infections of various organs and systems of human body viz. respiratory tract infections, urinary tract infections, central nervous system infections, congenital infections, reproductive tract infections, gastrointestinal infections, hepatitis, pyrexia of unknown origin, infections of eye, ear and nose, septicaemia, endocarditis, haemorrhagic fever etc.
7. Opportunistic infections
8. Sexually transmitted diseases
9. Vaccinology: principles, methods of preparation, administration of vaccines, types of vaccines
10. Information technology (Computers) in microbiology
11. Automation in Microbiology
12. Molecular techniques in the laboratory diagnosis of infectious diseases
13. Statistical analysis of microbiological data and research methodology
14. Animal and human ethics involved in microbiological work.
15. Safety in laboratory and Laboratory management

## XII LOG BOOK

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
(A University established by an Act of Andhra Pradesh Legislature)  
TIRUPATI - 517 507



## LOG BOOK

COMMON FOR MD/ DM/ M.Ch. POSTGRADUATES

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

## PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :

(Preferably be done by the faculty with whom the resident worked for mostpart of the period)

### **Quality parameters being assessed:**

1. Collection/transportation of specimens for microbiological investigations
2. Quality control of media, reagents etc.
3. Aseptic practices in laboratory and safety precautions.
4. Identification of bacteria of medical importance up to species level
5. Performance of antimicrobials susceptibility testing
6. Biomedical waste management
7. Academic Presentation
8. Punctuality / discipline

Signature of the candidate

Signature of the guide

Signature of the HoD  
with seal

**DETAILS OF POSTINGS OVER 3 YEARS**

**1st YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total:

Signature of Faculty:

**2nd YEAR**

**From..... To.....**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

3rd YEAR From..... To.....

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

Signature of Faculty:

Thesis Topic:

Guide :

Co-Guides :

### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### **Guidelines for evaluation of Seminar Presentations**

S.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty



## Guidelines for evaluation of Journal Review Presentations:

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material, Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyze the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### CASES PRESENTED IN MORTALITY CONFERENCE

S. No.	Topic	Signature of supervising Faculty

### LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED

S. No.	Topic	Signature of supervising Faculty

**LAB/ INVASIVE PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>

**CONFERENCES ATTENDED**

<b>S. No.</b>	<b>Name</b>	<b>Role</b>	<b>Signature of supervising Faculty</b>

**PUBLICATIONS**

<b>S. No.</b>	<b>Topic</b>	<b>Journal</b>	<b>Role</b>

**BEDSIDE CASE DISCUSSION**

<b>S. No.</b>	<b>Date</b>	<b>Diagnosis</b>	<b>Signature of Faculty Presented to</b>

## SUMMARY OF LOG BOOK

(To be filled at the end of the course & retained in this book)

Name of the student : Admn.No.

Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_

Name of the Institute:

- 1) No. of Journal Review Presentations : Presented ..... Attended .....
- 2) No. of Seminar Presentations : Presented ..... Attended .....
- 3) No. of Clinical Presentations : Presented ..... Attended .....
- 4) No. of Case Presentations : Presented ..... Attended .....
- 5) No. of UG Teaching Programmes : Conducted ..... Attended .....  
(Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
- 6) No. of PG Teaching Programmes : Attended
- 7) No. of Investigative Procedures : Performed .....Assisted.....Observed...
- 8) No. of Major Operations / : Performed .....Assisted.....Observed...  
Procedures /  
Experiments
- 9) No. of Minor Operations / : Performed .....Assisted.....Observed...  
Procedures /  
Experiments
- 10) No. of Emergencies : Performed .....Assisted.....Observed...
- 11) No. of Medico-legal work : Performed .....Assisted.....Observed...
- 12) No. of Public Health Visit /  
Social work /  
Survey /  
Immunization /  
Camps
- 13) No. of Clinico-PathologicalConference : Presented ..... Attended.....
- 14) No.of special investigation / : Conducted ..... Attended .....
- Procedure
- 15) No. of events attended Conferences..... Symposia .....  
Workshops ..... CME .....
- 16) Any other activities :

Signature of the candidate

Signature of the guide

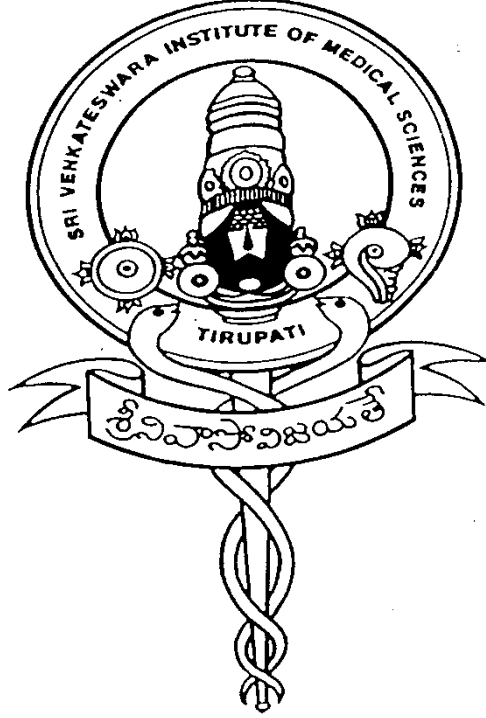
Signature of the  
HoD with seal

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES**

*(A University established by an act of Andhra Pradesh State Legislature)*

**TIRUPATI - 517 507**



**M.D. NUCLEAR MEDICINE COURSE**

**COMMON BOARD OF STUDIES MEETING**

**ON 21-07-2021**

**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**

**M.D. NUCLEAR MEDICINE COURSE**

**COMMON BOARD OF STUDIES MEETING ON 21.07.2021**

**I N D E X**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES::TIRUPATI**

**M.D (NUCLEAR MEDICINE)**

**COMMON BOARD OF STUDIES MEETING ON 21.07.2021**

List of Members

- |    |  |   |                            |
|----|--|---|----------------------------|
| 1. | Dr B. Siddhartha Kumar<br>Dean,<br>SVIMS, Tirupati.  | - | Chairman                   |
| 2. | Dr K.V. Sreedhar Babu<br>Registrar,<br>SVIMS, Tirupati.  | - | Member                     |
| 3. | Dr V. Suresh<br>Controller of Examinations,<br>SVIMS, Tirupati.                                | - | Member                     |
| 4. | Dr Dhanapathi Halanaik<br>Addl. Professor<br>Dept. of Nuclear Medicine<br>JIPMER, Pondicherry. | - | External expert            |
| 5. | Dr B.Vijayalakshmi Devi<br>Professor & I/C Head<br>Department of Radiology<br>SVIMS, Tirupati  | - | Internal expert            |
| 6. | Dr Tekchand Kalawat<br>Professor & Head<br>Dept. of Nuclear Medicine<br>SVIMS, Tirupati.       | - | Internal expert & convener |

# MD NUCLEAR MEDICINE COURSE

## THREE YEAR TRAINING PROGRAMME

### I. PREAMBLE

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. Nuclear medicine is a multi-disciplinary practice and the training of medical doctors is critical to the performance of a Nuclear Medicine department. Successful post graduate students are awarded a final certificate, degree or diploma that is recognized by the government, local health authority and hospital employer as an assurance of specialist competence in Nuclear Medicine. Post graduate training programme in Nuclear Medicine consists of an integrated training course of three years duration and would enable the post graduate student to practice nuclear medicine safely. The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

### II. AIMS & OBJECTIVES

#### **General:**

The aim of the post graduate training is to enable the trainee capable of practicing independently as a competent Clinical Nuclear Medicine Physician. The trainee should be compassionate and ethical in their practice of Nuclear Medicine diagnosis and therapy would also contribute to the future developments in Nuclear Medicine functional & molecular imaging and radionuclide therapies.

## **SUBJECT SPECIFIC LEARNING OBJECTIVES**

The **objective** of the programme is to enable the post graduate students to perform Nuclear Medicine practice, teaching and research independently and fulfill the manpower needs of ever-expanding new branch of diagnostic and therapeutic medicine.

**Post Graduate Training will consist of** Theoretical and Practical Training:

## **SUBJECT SPECIFIC COMPETENCIES**

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

### **A. Cognitive Domain:**

1. Should have knowledge of basic principles of radiation physics and its subsequent applications.
2. Should have knowledge of radiation protection principles.
3. Safe handling of radio nuclides and their disposal.
4. Should have knowledge of International Commission for Radiological Protection (ICRP) and National Regulatory guidelines pertaining to Nuclear Medicine practice.
5. Should have knowledge of diagnostic tests, interpretation of results and pitfalls.
6. Good clinical practice of therapeutic Nuclear Medicine and dosimetry.
7. Should be able to conduct clinical research and write a thesis/dissertation under supervision.
8. Should develop good working relationship with user specialties and handling inter-specialty referrals.

### **B. Affective domain:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

### **C. Psychomotor domain**



**At the end of the course, the student should have acquired the following skills:**

**A. Basic Sciences Experiment:**

1. Practical related to Physics, Instrumentation and its quality Control.
2. Preparation of radiopharmaceuticals and their quality control.
3. Detection of contamination in various work places.
4. Characterization of unknown isotopes.
5. Management of accidentals pillage.

**B. Clinical Experiment:**

1. GFR estimation.
2. Esophageal transit time.
3. Gastric emptying time.
4. Renal transplant evaluation.
5. Determination of ejection fraction and RWMA (wall motion).

### **III. REGULATIONS**

a. **Title of the programme:** The programme shall be called M.D. (Nuclear Medicine)

b. **Eligibility of admission:**

A candidate seeking admission into the course shall have NMC recognized M.B.B.S. Qualification.

c. **Duration of the Course:**

The duration of the course shall be three academic years including the period of examination.

d. **Syllabus:**

The Board of studies shall prepare and approve syllabus. It shall review the same periodically as per the guideline of NMC.

e. **Admission:**

All candidates shall be admitted for MD Nuclear Medicine through NEETPG entrance examination test conducted by ministry of health, Government of India.

f. **Bond:**

After successful completion of the course, the Government candidate shall work as a Senior Resident or suitable post offered by the institute/Government subject to availability of the vacancy and requirement of the institute/Government as per the bond executed by the student.

g. **Procedure for Discontinuation:**

After closure of the admissions, the student will not be permitted to discontinue studies, unless he/she fulfils the bond executed by him/her.

**h. Eligibility for Examination:**

1. As per NMC, the period of training for obtaining MD, Nuclear Medicine degrees shall be three completed years including the examination period. The final examination shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, provided they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, provided they take no further leave other than eligible Casual/Special Casual leave. Otherwise, they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

## 9. Teaching and learning methods:

Teaching methodology will be consisting of:

1. Didactic lectures in Physics related to Nuclear Medicine, radio pharmacy, radioisotopes techniques, instrumentation, data processing and quality control.
2. Participation in the daily routine work of the department including work rounds of patients admitted for radionuclide therapy.
3. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
4. Presentation of cases in the reporting sessions of the department.
5. Active participation in the combined clinical meetings and tumor board with other departments for case discussions.
6. Regular participation in department journal clubs, Seminars and other periodical

### 9A. The year-wise schedule of training will be as follows:

#### YEAR-1:

##### (A) Scientific principles:

- Basic physics and mathematics,
- Instrumentation,
- Principles of computing,
- Basic radiation biology and radiation protection,
- Basic radio pharmacy and radiochemistry,
- Principles of tracer technology.

##### (B) CLINICAL NUCLEAR MEDICINE:

- **Diagnostic:** Normal and abnormal appearances of images, mode of pharmaceutical uptake; normal variants and common artifacts in bone, heart, lung, kidney, brain, thyroid, tumor and infection images.
- **Therapeutic:** Basic principles of radionuclide therapy; treatment of hyperthyroidism, thyroid cancer and metastatic bone pain.
- **Principles of radiation protection:** ALARA (as low as reasonably achievable)

And ALARP (as low as reasonably practicable).

#### YEAR -2:

##### (A) Requirements of Year 1 in greater depth:

- Tracer kinetic:
- Computing and image processing;

- Radiobiology including the biological effects of high and low level radiation;
- Linear hypothesis and the threshold hypothesis of the biological response to low level radiation;
- The effective dose equivalent and the calculation of radiation dose from radio pharmaceuticals.

**(B) Radio pharmacy:**

- Properties of commonly used diagnostic and therapeutic radiopharmaceuticals;
- Production of radionuclides by reactors, cyclotrons and radionuclide generators;
- Quality assurance and quality control of radiopharmaceuticals.

**YEAR-3:**

**(A) Requirements of Year 2 in greater depth:**

- Principles of radiology including ultrasound, computerized tomography and magnetic resonance imaging.
- Co-registration of Nuclear Medicine images and those from other imaging techniques.
- Diagnostic: special investigations in cardiology, lung disease, gastroenterology, hepato-biliary diseases, nephron-urology, neurology and psychiatry, endocrinology, hematology, oncology and infection.

**(B) Therapeutic applications:**

- Treatment of bone metastases, neural crest tumors, prostate malignancies, solid malignancies;
- Use of radionuclide monoclonal antibodies and radionuclide labelled peptides for tumor therapy.

**(C) Further practice and experience of work accomplished in years 1 to 3:**

- Legal and regulatory requirements,
- Audit,
- Departmental management,
- Research techniques and evaluation,
- Teaching and training.

**9B. PRACTICAL TRAINING**

The post graduate students are obliged to play an active 'in-service' role in the practice of Nuclear Medicine to familiarize themselves with all the techniques required as a nuclear medicine practitioner, such as:





## 5. External and Outreach Activities / CMEs

The results of the formative assessments shall be maintained in the student appraisal forms and in the same format will be communicated to the Examination section while applying for the summative examination.

Internal assessment theory and practicals - Twice yearly. Marks obtained will not be counted for the final examination.

## IV. SUMMATIVE ASSESSMENT & EXAMINATIONS

The summative assessment and examination would be carried out as per the Rules given in Postgraduate Medical Education Regulations, 2000 amended from time to time. University shall conduct maximum two examinations in a year, for MD Nuclear Medicine subject. In case there are two examinations in a given year, the interval between them shall be 4 to 6 months (minimum to maximum).

### **Format of Examination:**

Postgraduate examinations (MD Nuclear Medicine) shall consist of **Thesis, Theory Papers, clinical, practical and oral examinations.**

### **a) MD Nuclear Medicine Thesis:**

- Every candidate shall carry out work on an assigned research project under the guidance of a MD Nuclear Medicine recognized Post Graduate Teacher as per the norms laid down by NMC. , the result of which shall be written up and submitted in the form of a Thesis. The decision of the HOD concerned is final in allocation of guide to each post graduate.
- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.
- In the event of a registered guide leaving the institute for any reason or in the event of death, the guide, may be changed with prior permission from the Dean/or a committee constituted by Dean of the institute.
- Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the thesis protocol approval committee (TPC) constituted by the institution, during its meeting proposed to be held in the month of January each year.
- After obtaining approval from TPC, the thesis protocol shall be submitted in February to Institutional Ethics Committee (IEC) for clearance.

- The student should submit 4 hard copies of the thesis and one soft copy in the form of CD/DVD, six months before the Theory and Clinical / Practical examination.
- While submitting the thesis, the plagiarism clearance report to be attached as per the regulations of SVIMS university . (for detailed regulations see the Annexure - III)
- The thesis shall be examined by a minimum of three examiners; one internal and two external examiners (these external examiners) shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

**b) Theory examination for MD Nuclear Medicine:**

There shall be four theory papers, each of 3 hours duration. As per the NMC guidelines and BOS approved syllabus for MD Nuclear Medicine each paper shall be clear in title representing the training syllabus. As per the NMC guidelines Paper I shall be based on the basic science related to Nuclear Medicine curriculum and paper IV shall be based on the recent advances related to Nuclear Medicine.

The title of all theory papers shall be:

S. No.	Paper No.	Title
1.	Paper I	Basic Sciences related to Nuclear Medicine
2.	Paper II	Diagnostic Nuclear Medicine
3.	Paper III	Therapeutic Nuclear Medicine
4.	Paper IV	Recent advances in Nuclear Medicine

- The time duration of each paper will be 3 hours, each paper shall be assigned with total 100 marks, each paper will contain 10 questions of 10 marks each.
- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the Clinical/Practical and Oral examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.
- Moderation of Question Papers :



A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

- One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
- Controller of Examinations
- Dean

**c) MD Nuclear Medicine Practical Examination:**

- Clinical examination for the subjects shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- Practical examination for the subjects in Basic Sciences related to Nuclear Medicine shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental study.
- **Oral / Viva-Voce:** The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty of Nuclear Medicine.

**Panel of Examiners:**

There shall be a panel of 8 external examiners from outside the state as advised by the Head of the department. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

**Appointment of Examiners:**

- No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
- For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State.
- Two internal examiners shall be appointed within the institution. If the internal examiners are not available within the institution, the institute can appoint any

eligible internal examiners as recommended by the HOD within the state or outside the state.

- An examiner shall ordinarily be appointed for not more than two consecutive terms
- The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

## 2. Number of Candidates:

The maximum number of candidates to be examined in Clinical / Practical and Oral on any day shall not exceed eight for M.D examinations or as specified by NMC.

## 3. Practical Examination:

Practical examination shall consist of one long case and two short case, clinical spots, basic science practical, basic science spots and Viva Voce with all together total 300 marks. Viva voce will be conducted by all examiners.

**Practical will include (with prescription of marks) as:**

S. No.	Examination details	Marks
1.	One long case (practical conduction of clinical investigation)	60
2.	Two short case (practical conduction of clinical investigation)	30 x 2 = 60
3.	Clinical scan (20 x 2)	40
4.	Basic science experiment	40
5.	Basic science spots (10 x 2)	20
6.	Grand viva voice	80
	Total	300

## 4. Marking System for the Examination:

- The examinations shall be organised on the basis 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for MD Nuclear Medicinedegree examinations.
- Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
- Award of Class:

Pass class : 50 to 74% of the aggregate marks

Distinction : 75% and above of the aggregate marks

Distinction shall be awarded only to the students who obtained 75% and above in the aggregate marks in the very first attempt

## **V. Syllabus for MD -Nuclear Medicine**

The broad outlines of the course contents are given below:

### **Course contents:**

The syllabus is divided into the following four parts:

1. Basic Science aspects of Radiation Physics and its application to diagnostic/ Therapeutic Nuclear Medicine
2. Diagnostic Nuclear Medicine and its applications
3. Therapeutic Nuclear Medicine and its applications
4. Recent Advances in Nuclear Medicine
5. At the end of the course, the student should have acquired knowledge in the following:

### **PART I: BASIC SCIENCE RELATED TO NUCLEAR MEDICINE**

#### **1.1 Radiation Physics and Instrumentation:**

- a. Structure of atom, Natural and artificial radioactivity.
- b. Modes of Radioactive decay.
- c. Interaction of radiation with matter.
- d. Principles of radiation detection and detectors.
- e. Basic principles of production of radionuclides by reactors and cyclotrons.
- f. Nuclear Medicine Instrumentation including Gamma Cameras, Single Photon Computed Tomography (SPECT), Positron Emission Tomography (PET), Hybrid Imaging Systems like SPECT/CT, PET/CT and PET/MR
- g. Counting Systems: Well counters, liquid scintillation counters, spectrometers, Radioactive Iodine Uptake (RAIU) probe and radiation monitoring devices.
- h. Quality control of Nuclear Instruments, as in (f and g).
- i. Collimation of radiation detectors and the characteristics of various collimators, their response to point, line and plane sources.
- j. Electronic instruments, such as pulse amplifiers, pulse height analyzer, count rate meters and computer interfaces including gating devices.
- k. Software and hardware fusion technology, Digital Imaging and Communications in Medicine (DICOM) technology and Picture Archiving and Communication System (PACS).

#### **1.2 Mathematics, Statistics and Computer Sciences:**

- a. Basic Mathematical concepts, counting statistics, probability distribution, Bayesian and McNemmar statistics, parametric and nonparametric statistics.
- b. Compartmental analysis and mathematical models of physiologic systems.
- c. Basic aspects of computer structure, function and programming.
- d. Computer applications with emphasis on digital image acquisition, analysis, processing and enhancement, tomographic reconstruction, display and recordings of findings.
- e. Fundamental of filters, their applications and uses.

### **1.3 Radiation Biology:**

- a. The biological effects of radiation exposure with emphasis on the effects of low level exposure.
- b. Methods of reducing unnecessary radiation exposure to patients, personnel and environment.
- c. ICRP recommendations and their amendments from time to time and other international recommendations, environmental regulations- regarding limits of radiation exposure, handling of radioactive patients, transport of radioactivity material and disposal of radioactive wastes.
- d. The diagnosis, evaluation and treatment of radiation over exposure in any form.

## **PART 2: DIAGNOSTIC NUCLEAR MEDICINE**

### **2.1 Radiopharmaceuticals**

The chemical, physical and biological properties of radiopharmaceuticals used in Nuclear Medicine investigations; production, Quality Control and Regulations of hospital based-Nuclear Pharmacy. The emphasis will be on:

- a. Physical and chemical characteristics of radionuclide used in diagnostic Nuclear Medicine.
- b. Criteria for selection of radionuclide for diagnostic purposes
- c. Biological behavior of radiopharmaceuticals
- d. Quality control
- e. Mechanism of localization
- f. Positron Emitting radio nuclides, target reactions and their radiopharmaceuticals chemistry, various synthetic modules.
- g. Specific topics on Radiopharmaceuticals: Bone seeking, hepato biliary, brain and cerebrospinal fluid (CSF), renal, thyroid, parathyroid, infection imaging, Tumor Seeking, cardiac imaging etc.
- h. Good Manufacturing Practice (GMP) and Laws pertaining to in-house manufacturing of Radiopharmaceuticals.
- i. Radiopharmaceuticals for Research.

### **2.2 In vivo Diagnostic Imaging**

- a. General clinical indications for organ imaging; normal and altered anatomy, physiology, biochemistry and metabolism of various organs. Must learn the technical

aspects of performing the procedures including proper patient preparation and patient management before, during and after the procedure.

- b. In vivo imaging and/or functional studies including brain Single Photon Emission Computed Tomography (SPECT), tracing of cerebrospinal fluid pathways, thyroid imaging, salivary glands, lungs, heart, gastrointestinal, hepatobiliary system, spleen, kidney, prostate, adrenal, bone and joints, bone marrow evaluation etc.
- c. The use of physiologic gating techniques for functional studies and patient monitoring during intervention, both physical exercise and using pharmacological stress agents
- d. Cellular kinetics, absorption and excretion analysis, nuclear hematology and metabolic balance studies using radiotracers.
- e. Comparative analysis of Nuclear Medicine procedures with X-ray, Ultrasound, Echo, MRI, CT and angiography etc. f. Nuclear Cardiology: Stress and redistribution studies using Thallium<sup>201</sup> and other technetium-based myocardial perfusion agents; myocardial viability, Gated SPECT studies, etc.
- f. Positron Emission Tomography (PET): All indications for use of PET imaging in oncology, cardiology, neurosciences and psychiatric disorders.

### **2.3 In vitro Studies:**

- a. Principles of Radioimmunoassay (RIA), quality control and data analysis for various hormones and drugs assays.
- b. Glomerular Filtration Rate (GFR) estimation, Red Cell Survival, Red Cell Mass using chromium and C14 urea Breath test.

## **PART 3: THERAPEUTIC NUCLEAR MEDICINE**

3.1 Principles of Internal Dosimetry: Calculation of the radiation dose from internally administered radionuclide

3.2 Characteristics of Radio nuclides/Radiopharmaceuticals for radionuclide therapy

3.3 Radiation protection in therapeutic set up: Design of Isolation ward as per the norms of Atomic Energy Regulatory Board (AERB)

3.4 Principles of OPD and in-door therapy administration

3.5 Therapy in thyroid disorders; benign thyroid diseases, etiology of hyperthyroidism, various modalities of treatment and follow up strategy, long-term outcome and various national and international regulations pertaining to therapeutic administration of radio nuclides.

Therapy in thyroid disorders; etiopathology, classification and diagnosis of thyroid nodules and malignancies-various modalities of treatment and follow-up strategies, long-term outcome and various national and international regulations pertaining to therapeutic administration of radio nuclides.

3.6 Bone pain palliation using various radio nuclides such as P<sup>32</sup>, Sr<sup>89</sup>, Y<sup>90</sup>, Sm<sup>153</sup>, Ra<sup>223</sup>, Lu<sup>177</sup> etc.

- 3.7 Radio synevectomy
- 3.8 Radio peptide therapy and Radio conjugate therapy
- 3.9 Radio immunotherapy
- 3.10 Loco regional internal radiation therapy
- 3.11 Research agents in radionuclide therapy

#### **PART 4: RECENT ADVANCES IN NUCLEAR MEDICINE**

Covering all aspects of the following areas:

- 4.1 Instrumentation
- 4.2 Radiopharmaceuticals
- 4.3 Diagnostic procedures
- 4.4 Therapeutic procedures

### **VI. Recommendations of Books & Journals**

#### **BOOKS:**

1. Principles of Nuclear Medicine by Henry N. Wanger (Jr.).
2. Pediatric Nuclear Medicine by James A.E. Wanger H.N. & R.E. Cooke.
3. Text book of Nuclear Medicine Technology by Paul J. Early, M. Razak et al.
4. Basic Science of Nuclear Medicine by Parker R.P. P.Poter, H.S, Smith Davidson.
5. Nuclear Cardiology, Principles & Methods by A.N. Serafini Albert J. Gilson William M. Smoak.
6. Therapy in Nuclear Medicine by Richard P. Spencer.
7. Computer methods- The fundamentals of digital medicine by David E. Liberman.
8. Radiopharmaceuticals by G. Subramanian, Rhodes B.A. et al.
9. Quality control in Nuclear Medicine radiopharmaceuticals, instrumentation & in-vitro assays by Butt A. Rhodes.
10. Radiation Protection- Guide for physician & Scientist by J. Shapire.
11. Nuclear Medicine-In-vitro by Benjamin Ruthfeld.
12. Radio Immunoassay & related technique, methodology & clinical applications by J.I. Thornell& S.M. Marson.
13. Nuclear Medicine, Endocrinology by Benjamin Ruthfeld.
14. Physics in Nuclear Medicine- Simon R Cherry, James A. Sorenson.
15. Nuclear Medicine- Robert E. Henkin.
16. Essential of Nuclear Medicine-F. A. Mettler.
17. Nuclear Medicine, Techniques & Technology- by Paul Chritian.
18. Nuclear Medicine Physics, The Basics-By Ramesh Chandra.
19. The pathophysiologic basis of Nuclear Medicine-by AbdelhamidAlgazzar.
20. Technetium<sup>99m</sup> Radiopharmaceuticals by I. Zole.
21. Positron Emission Tomography-Dale L. Bailey.
22. Pediatric Nuclear Medicine/PET-By S.T.Treves.

23. The requisites- Nuclear Medicine-by Harvey A.Ziessman.
24. Hybrid PET/CT and SPECT/CT imaging-by Dominique Delbeke.
25. Neuro PET, by Herholz
26. Molecular anatomic Imaging, by Von Schulthess
27. Principles and Practice of Nuclear Medicine, by Paul, J. Early, D. Bruce Sodee
28. Diagnostic Nuclear Medicine, by Sandler and Gottchalk
29. Nuclear Medicine in Clinical Diagnosis and Treatment, by Ell and Gambhir
30. Positron Emission Tomography, by Valk, Bailey, Townsend
31. Practical FDG Imaging A teaching File, by Debelke, Martin, Patton, Sandler.
32. Functional Cerebral SPECT and PE Imaging
33. CT and MR Imaging of the whole body, Haaga, Lanzieri, Gilkeson
34. Multi detector CT : Principle Techniques and Clinical Applications, by Fishman  
Jeffrey Normal Lymph node Topography 35.CT atlas, by Richter Feyerabind

#### **JOURNALS:**

1. Journal of Nuclear Medicine.
2. European Journal of Nuclear Medicine and molecular imaging.
3. International Journal of Nuclear Medicine& Biology.
4. Clinical Nuclear Medicine.
5. Journal of Labeled compounds & radiopharmaceuticals.
6. International Journal of applied radiation & Isotopes.
7. International Journal of Radiation Biology.
8. Indian Journal of Nuclear Medicine.
9. World journal of Nuclear Medicine.
10. Nuclear Medicine communication.
11. PET clinics.
12. Seminars in Nuclear Medicine.

## Annexure-I

### PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

#### MD Nuclear Medicine Postgraduate Students

#### Appraisal Form

Department of Nuclear Medicine

Name of the PG Student :

Period of Training : FROM..... TO.....

Sl. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
1	Journal based / recent advances learning	1 2 3	4 5 6	7 8 9	
2	Patient based /Laboratory or Skill based learning				
3	Self directed learning and teaching				
4	Departmental and interdepartmental learning activity				
5	External and Outreach Activities / CMEs				
6	Thesis / Research work				
7	Log Book Maintenance				

Publications

YES/ NO

Remarks\* \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD

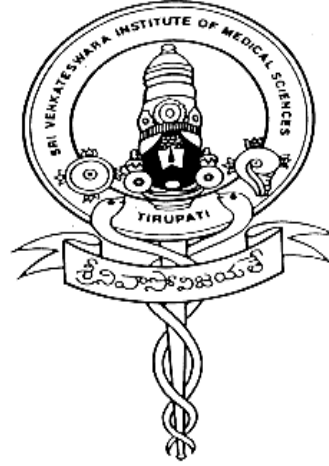


Annexure-II

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,

(A University established by an Act of Andhra Pradesh Legislature)

TIRUPATI - 517 507



LOG BOOK

COMMON FOR MD/ DM/ M.Ch. POSTGRADUATES

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

**DETAILS OF POSTINGS OVER 3 YEARS**

**1st YEAR**                      **From..... To.....**

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

Signature of Faculty :

**2nd YEAR**                      **From..... To.....**

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

**3rd YEAR** From..... To.....

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>	<b>NO. OF NIGHT DUTIES</b>

Total :

Signature of Faculty :

Thesis Topic:

Guide:

Co-Guides :

### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### Guidelines for evaluation of Journal Review Presentations

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material , Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyse the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:  
 Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**CASES PRESENTED IN MORTALITY CONFERENCE**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LAB / INVASIVE PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>

### CONFERENCES ATTENDED

S. No.	Name	Role	Signature of supervising Faculty

### PUBLICATIONS

S. No.	Topic	Journal	Role

### BEDSIDE CASE DISCUSSION

S. No.	Date	Diagnosis	Signature of Faculty Presented to

## SUMMARY OF LOG BOOK

(To be filled at the end of the course & retained in this book)

Name of the student : \_\_\_\_\_ Admn.No. \_\_\_\_\_

Name of the Course : \_\_\_\_\_ From: \_\_\_\_\_ To: \_\_\_\_\_

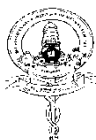
Name of the Institute: \_\_\_\_\_

- |   |   |                |
|---|---|----------------|
| 1) No. of Journal Review Presentations  | : Presented .....                         | Attended ..... |
| 2) No. of Seminar Presentations   | : Presented .....                         | Attended ..... |
| 3) No. of Clinical Presentations  | : Presented .....                         | Attended ..... |
| 4) No. of Case Presentations  | : Presented .....                         | Attended ..... |
| 5) No. of UG Teaching Programmes<br>(Theory class / Clinics / Practicals /<br>Demonstrations / Tutorials) | : Conducted .....                         | Attended ..... |
| 6) No. of PG Teaching Programmes  | : Attended                                |                |
| 7) No. of Investigative Procedures  | : Performed .....Assisted.....Observed... |                |
| 8) No. of Major Operations /<br>Procedures /<br>Experiments   | : Performed .....Assisted.....Observed... |                |
| 9) No. of Minor Operations /<br>Procedures /<br>Experiments   | : Performed .....Assisted.....Observed... |                |
| 10) No. of Emergencies  | : Performed .....Assisted.....Observed... |                |
| 11) No. of Medicolegal work   | : Performed .....Assisted.....Observed... |                |
| 12) No. of Public Health Visit /<br>Social work /<br>Survey /<br>Immunization /<br>Camps                  |   |                |
| 13) No. of Clinico Pathological Conference:   | Presented .....                           | Attended ..... |
| 14) No. of special investigation /<br>Procedure   | : Conducted .....                         | Attended ..... |
| 15) No. of events attended  | Conferences..... Symposia .....           |                |
|   | Workshops ..... CME .....                 |                |
| 16) Any other activities  | :   |                |

Signature of the Candidate \_\_\_\_\_ Signature of the guide \_\_\_\_\_

Signature of the HoD with seal \_\_\_\_\_





## Annexure-III

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**  
(A University established by an Act of A.P. State Legislature)

**GUIDELINES FOR 'PLAGIARISM' CHECK**  
**WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D students**

**Ref.:Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for ThefRses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

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They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

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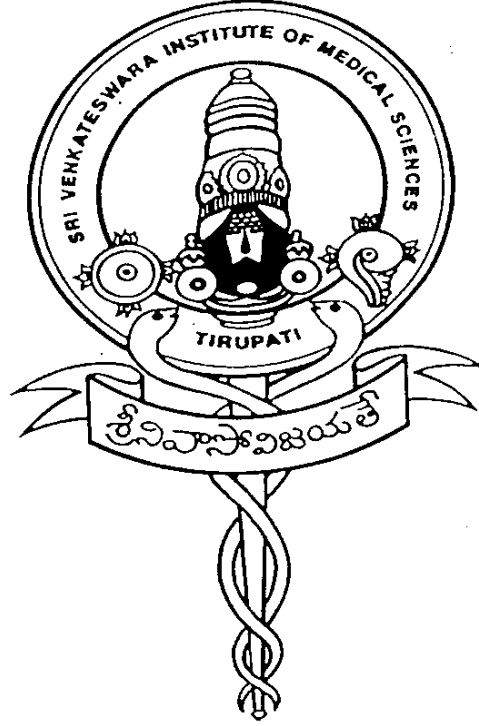
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To: The HOD/Chief Guide Concerned for information and circulation among the respective students.

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI - 517 507**



**M.D. - PATHOLOGY**

**COMMON BOARD OF STUDIES MEETING**

**ON 21.07.2021**

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**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUAPATI**

**M.D. (PATHOLOGY)**

**COMMON BOARD OF STUDIES MEETING ON 21/07/2021**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**

**M.D (PATHOLOGIST)**

**COMMON BOARD OF STUDIES MEETING ON 21.07.2021**

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## **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PATHOLOGY**

### **I.PREAMBLE**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. This programme is meant to standardize Pathology teaching at post graduate level throughout the country so that it will benefit in achieving uniformity in teaching and resultantly creating suitable manpower with appropriate expertise. The post graduate student should be trained in handling and processing histopathology, clinical pathology, microbiology, biochemistry and transfusion medicine samples with a knowledge of general principles and methodology.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of "domains of learning" under the heading "competencies".

#### **Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

**Attendance:** All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

## **DISTRICT RESIDENCY PROGRAMME (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3rd or 4th or 5th semester of the Postgraduate programme. This rotation shall be termed as "District Residency Programme (DRP)" and the postgraduate medical student undergoing training shall be termed as a "District Resident".

### **II.SUBJECT SPECIFIC LEARNING OBJECTIVES**

The learning objectives in the cognitive, psychomotor and affective domains are:

#### **A. Cognitive Domain**

1. Perform histopathology, cytopathology, haematopathology and Laboratory medicine (clinical pathology, clinical biochemistry) as well as blood banking(Transfusion medicine) evaluation of various specimens from patients for the routine and complex clinical problems
2. Interpret and correlate clinical and laboratory data so that clinical manifestations of diseases can be explained and diagnose routine and complex clinical problems
3. Advise on the appropriate ancillary tests/investigations necessary to arrive at a diagnosis in a problematic case.
4. Correlate clinical and laboratory findings with pathology findings at autopsy, identify miscorrelations and the causes of death due to diseases (apart from purely metabolic causes).
5. Teach Pathology to undergraduates, other peer postgraduates, nurses and paramedical staff including any other laboratory personnel.
6. Plan, execute, analyse and present research work.
7. Participate actively in the laboratory quality control exercise by making and recording observations systematically and maintain accurate records of tests and their results for reasonable periods of time. Identify problems in the laboratory, offer solutions thereof and maintain a high order of quality control.
8. Capable of safe and effective disposal of laboratory waste.
9. Able to supervise and work with subordinates and colleagues in a laboratory.

#### **B. Affective Domain**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

3. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

### **C. Psychomotor Domain**

1. Able to perform routine tests in a Histopathology Laboratory including grossing of specimens, processing, cutting of paraffin and frozen sections, making smears, and staining.
2. Able to collect sample/ specimens by routinely performing procedures such as venepuncture(for collection of blood samples), finger-prick, fine needle aspiration of palpable superficial lumps, bone-marrow aspiration, and provide appropriate help to colleagues performing an invasive procedure such as a biopsy or an imaging guided biopsy.
3. Perform an autopsy, dissect various organ complexes and display the gross findings.
4. Should be familiar with the function, handling and routine care of equipment's in the laboratory.

## **III.SUBJECT SPECIFIC COMPETENCIES**

### **A. Cognitive domain**

**A post graduate student upon successfully qualifying in the MD (Pathology) examination should have acquired the following broad theoretical competencies and should be:**

1. Capable of offering a high quality diagnostic opinion in a given clinical situation with an appropriate and relevant sample of tissue, blood, body fluid, etc. for the purpose of diagnosis and overall wellbeing of the ill.
2. Able to teach and share his knowledge and competence with others. The student should be imparted training in teaching methods in the subject which may enable the student to take up teaching assignments in Medical Colleges/Institutes.
3. Capable of pursuing clinical and laboratory based research. He/she should be introduced to basic research methodology so that he/she can conduct fundamental and applied research.

### **B. Affective domain**

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.

### **C. Psychomotor domain**

**At the end of the course, the student should have acquired skills, as**

**Surgical pathology/Histopathology Skills:** Given the clinical and operative data, the student should be able to identify, and systematically and accurately describe the chief gross anatomic alterations in the surgically removed specimens and be able to correctly diagnose at least 80% of the lesions received on an average day from the surgical service of an average teaching hospital.

A student should be able to demonstrate ability to perform a systematic gross examination of the tissues including the taking of appropriate tissue sections and in special cases as in intestinal mucosal biopsies, muscle biopsies and nerve biopsies, demonstrate the orientation of tissues in paraffin blocks.

The student should be able to identify and systematically and accurately describe the chief histo-morphological alterations in the tissue received in the surgical pathology service. He/she should also correctly interpret and correlate with the clinical data to diagnose at least 90% of the routine surgical material received on an average day.

Be conversant with automatic tissue processing machine and the principles of its running.

Process a tissue, make a paraffin block and cut sections of good quality on a rotary microtome.

**Stain paraffin sections with at least the following:**

- (i) Haematoxylin and eosin
- (ii) Stains for Collagen, Elastic fibres and Reticulin
- (iii) Iron stain
- (iv) Stains for mucins such as, Alcain blue, Periodic Acid Schiff stain and Mucicarmine stain
- (v) Staining different microorganisms including Acid fast stains (Different types of modifications) Gomorismethenamine stain etc.
- (vi) Congo red stain for Amyloid
- (vii) Any other stains needed for diagnosis.

**Demonstrate understanding of the principles of:**

- (i) Fixation of tissues
- (ii) Processing of tissues for section cutting
- (iii) Section cutting and maintenance of related equipment
- (iv) Cytochemical (special) stains and their utility



Cut a frozen section using cryostat, stain and interpret the slide in correlation with the clinical data provided.

**Immunohistochemistry:** Understand the principles of IHC various methods, able to perform manual IHC methods understand the various IHC markers and their use in specific clinical/Histopathological contexts, their interpretation and arrive at a diagnosis based on the observations.

**Cytopathology Skills:** Independently process various samples received in a cytopathology laboratory such as serous effusions, urine, bronchial washins, BAL fluid, sputum, CSF, cystic fluids, intra operative peritoneal fluid, scrape smears and any other specimen and make suitable smear preparations as per SOP. Prepare and apply routinely stains used in cytology such as Geimsa, MGG, H&E, and Papanicolaou stains on smears to obtain good quality smears for cytopathologic examination.

Be conversant with the appropriate techniques for concentration of specimens: i.e; various filters, centrifuge and cytocentrifuge.

Independently be able to perform fine needle aspiration of all lumps in patients and make good quality smears, collection material for appropriate ancillary studies as required in that case which may include cell block preparation, molecular studies and microbiological studies such as culture, gene expert, PCR etc.

**Given the relevant clinical data, he/she should be able to independently and correctly:**

- (i) Diagnose at least 75% of the cases received in a routine laboratory
- (ii) In exfoliative cytology and FNAC specimen categorize them into negative inconclusive and positive and as per current reporting systems and guide lines.
- (iii) Indicate correctly the type of tumour, if present
- (iv) Identify with reasonable accuracy the presence of organisms, fungi and parasites

**Haematology Skills: Correctly and independently perform the following special tests, in addition to doing the routine blood counts:**

- (i) Complete blood counts in a routine Haemogram including reticulocyte and platelet counts.
- (ii) Bone marrow staining and interpretation including iron stain
- (iii) ESR evaluation and interpretation
- (iv) Blood smear staining and interpretation
- (v) Cytochemical characterization of leukaemia with special stains like Peroxidase, Leukocyte Alkaline Phosphatase (LAP), PAS, Sudan Black, etc.
- (vi) Investigation and work up a suspected case of Haemolytic anaemia, including G6PD assay, HPLC, Hb electrophoresis etc.
- (vii) Coagulation profile including PT, APTT, FDP.

(viii) BM aspiration and BM biopsy

**Demonstrate familiarity with the principle and interpretation of results and the utility in diagnosis of the following:**

- (i) Platelet function tests including platelet aggregation and adhesion and PF3 release.
- (ii) Thrombophilia profile: Lupus anticoagulant (LAC), Anticardiolipin Antibody (ACA), Activated Protein C Resistance (APCR), Protein C (Pr C), Protein S (Pr S) and Antithrombin III (AT III)
- (iii) Immuno-phenotyping of leukaemia by flow cytometry
- (iv) Cytogenetics
- (v) Molecular diagnostics.

Describe accurately the morphologic findings in the peripheral and bone marrow smears, identifying and quantitating the morphologic abnormalities in disease states and arriving at a correct diagnosis in at least 90% of the cases referred to the Haematology clinic, given the relevant clinical data.

#### **Laboratory Medicine Skills:**

Plan a strategy of laboratory investigation of a given case, given the relevant clinical history and physical findings in a logical sequence, with a rational explanation of each step; be able to correctly interpret the laboratory data of such studies, and discuss their significance with a view to arrive at a diagnosis.

**Demonstrate familiarity with and successfully perform:**

- i) Routine urinalysis including physical, chemical and microscopic examination of the sediment.
- ii) Macroscopic and microscopic examination of faeces and identify the ova and cysts of common parasites.
- iii) A complete examination: physical, chemical & cell content of Cerebrospinal Fluid (C.S.F), pleural, Ascitic and peritoneal fluids.
- iv) Semen analysis.
- v) Examination of peripheral blood for commonly occurring parasites.

**Independently and correctly perform at least the following quantitative estimations by manual techniques and/or automated techniques.**

- (i) Blood urea
- (ii) Blood sugar
- (iii) Serum proteins (total and fractional)
- (iv) Serum bilirubin (total and fractional)

**Demonstrate familiarity with the following quantitative estimations of blood/serum by Automated Techniques:**

LFT panel

RFT panel

LIPIDOGRAM

Blood sugar, GTT, HBA1C,

Prepare standard solutions and reagents relevant to the above tests, including the preparation of normal solution, molar solution and buffers.

Explain the principles of Instrumentation, use and application of the instruments commonly used in the labs eg. Photoelectric colorimeter, Spectrophotometer, pHmeter, Centrifuge, Electrophoresis apparatus, ELISA Reader, flow cytometer, PCR, chemiluminiscence.

**Transfusion Medicine Skills: The student should be able to correctly and independently perform the following:**

Selection and bleeding of donors

Preparation of blood components i.e. Cryoprecipitate, Platelet concentrate, Fresh Frozen Plasma, Single Donor Plasma, Red Blood Cell concentrates.

ABO and Rh grouping.

**Demonstrate familiarity with Antenatal and Neonatal work up.**

- (i) Direct anti globulin test
- (ii) Antibody screening and titre
- (iii) Selection of blood for exchange transfusion

**Demonstrate familiarity with principle and procedures involved in:**

- (i) Resolving ABO grouping problems.
- (ii) Identification of RBC antibody.
- (iii) Investigation of transfusion reaction.
- (iv) Testing of blood for presence of:

- (a) HBV (Hepatitis B Virus Markers).
- (b) HCV (Hepatitis C Virus Markers)
- (c) HIV (Human Immunodeficiency Virus Testing)
- (d) VDRL
- (e) Malaria

### **Immunohistochemistry Skills (desirable)**

Be able to perform immuno-histochemical staining using paraffin section with at least one of the commonly used antibodies (Cytokeratin or LCA) using PAP method.

## **IV.SYLLABUS**

### **Course contents:**

The study of Pathologic Anatomy includes all aspects of Pathology as encompassed in the branches of General and Systemic Pathology.

**A) General Pathology:** Structure of Normal cell its organization into various tissues, their structures and function in normal physiological state. The changes in cellular structure and function in disease state is broadly the study of general pathology. Etiological causes of various diseases and their pathogenesis. Reaction of cells, tissues, organ systems and the body as a whole to various sublethal and lethal injuries. General Pathology is vast and the above is a guideline that in essence covers all aspects.

**B) Systemic Pathology:** The study of normal structure and function of various organ systems and the etiopathogenesis, gross and microscopic alterations of structure of these organ systems in disease and functional correlation with clinical features. All organ systems are to be studied. This forms the basis of Histopathology (Surgical Pathology), Cytopathology, Autopsy Pathology and Clinico-pathological correlation.

**C) Haematology:** The study of Haematology includes all aspects of the diseases of the blood and bone marrow. This would involve the study of the normal, and the causes of diseases and the changes thereof.

1. **Laboratory Medicine** (Clinical Biochemistry/Clinical Pathology including Parasitology).
2. **Transfusion Medicine** (Blood Banking).
3. The student is expected to acquire a general acquaintance of techniques and principles and to interpret data in the following fields.

- a) Immunopathology
- b) Electron microscopy

- c) Histochemistry
- d) Immunohistochemistry
- e) Cytogenetics
- f) Molecular Biology
- g) Maintenance of records
- h) Information retrieval, use of Computer and Internet in medicine.
- i) Quality control, waste disposal

Apost graduate is supposed to acquire not only the professional competence of a well-trained specialist but also academic maturity, a capacity to reason and critically analyse scientific data as well as to keep himself abreast of the latest developments in the field of Pathology and related sciences. A brief outline of what is expected to be learnt during the MD Course is given under each head.

### **Surgical Pathology**

**Knowledge:** The student should be able to demonstrate an understanding of the histogenetic and patho-physiologic processes associated with various lesions.

Should be able to identify problems in the laboratory and offer viable solutions.

Should be aware of the techniques of autopsy.

Should have sufficient understanding of various disease processes so that a meaningful clinico-pathological correlation can be made.

Demonstrate ability to perform a complete clinical autopsy independently with some physical assistance, correctly following the prescribed instructions. Correctly identify all major lesions which have caused, or contributed to the patient's death, on macroscopic examination alone and on microscopy in at least 90% of the autopsies in an average teaching hospital.

In places where non-medico-legal clinical autopsies are not available each student should be made to observe at least five medico-legal autopsies.

Write correctly and systematically Provisional and Final Anatomic Diagnosis reports.

### **Cytopathology**

**Knowledge:** Should possess the background necessary for the evaluation and reporting of cytopathology specimens.

**Demonstrate familiarity with the following keeping in mind the indication for the test.**

- (i) Choice of site from which smears may be taken
- (ii) Type of samples
- (iii) Method of obtaining various specimens (urine sample, gastric lavage, colonic lavage etc.)
- (iv) Be conversant with the principles and preparation of solutions of stains

## **Haematology Knowledge**

Should demonstrate the capability of utilising the principles of the practice of Haematology for the planning of tests, interpretation and diagnosis of diseases of the blood and bone marrow.

Should be conversant with various equipment's used in the Haematology laboratory.

Should have knowledge of automation and quality assurance in Haematology.

Correctly plan a strategy of investigating at least 90% of the cases referred for special investigations in the Haematology Clinic and give ample justification for each step in consideration of the relevant clinical data provided.

## **Laboratory Medicine Knowledge**

Possess knowledge of the normal range of values of the chemical content of body fluids, significance of the altered values and its interpretation.

Possess knowledge of the principles of following specialized organ function tests and the relative utility and limitations of each and significance of the altered values.

- (i) Renal function tests
- (ii) Liver function tests
- (iii) Pancreatic function tests
- (iv) Endocrine function tests
- (v) Reproductive function tests
- (vi) Tests for malabsorption

Know the principles, advantages and disadvantages, scope and limitation of automation in the laboratory.

Know the principles and methodology of quality control in the laboratory.

## **Transfusion Medicine (Blood Banking) Knowledge**

The student should possess knowledge of the following aspects of Transfusion Medicine.

Basic immunology

ABO and Rh groups

Clinical significance of other blood groups

Transfusion therapy including the use of whole blood and RBC concentrates

Blood component therapy

Rationale of pre-transfusion testing.

Infections transmitted in blood.

Adverse reactions to transfusion of blood and components

Quality control in blood bank

## **Basic Sciences (in relation to Pathology):**

### **a) Immuno pathology Knowledge:**

Demonstrate familiarity with the current concepts of structure and function of the immune system, its aberrations and mechanisms thereof.

Demonstrate familiarity with the scope, principles, limitations and interpretations of the results of the following procedures employed in clinical and experimental studies relating to immunology.

- ELISA techniques
- Radioimmunoassay
- HLA typing

Interpret simple immunological tests used in diagnosis of diseases and in research procedures.

- (i) Immuno-electrophoresis
- (ii) Immunofluorescence techniques especially on kidney and skin biopsies
- (iii) Anti-nuclear antibody (ANA)
- (iv) Anti-neutrophil cytoplasmic antibody (ANCA)

### **b) Electron Microscopy Knowledge**

Demonstrate familiarity with the principles and techniques of electronmicroscopy and the working of an electron microscope (including Transmission and Scanning Electron microscope: TEM and SEM) Recognise the appearance of the normal subcellular organelles and their common abnormalities (when provided with appropriate photographs).

### **c) Enzyme Histochemistry Knowledge**

Should be familiar with the principles, use and interpretation of common enzyme histochemical procedures (Alkaline Phosphatase, Acid Phosphatase, Glucose-6-Phosphate Dehydrogenase, Chloroacetate Esterase).

### **d) Immunohistochemistry Knowledge**

Demonstrate familiarity with the principles and exact procedures of various immune-histochemical stains using both PAP (Peroxidase-antiperoxidase) and AP-AAP (Alk.Phosphatase-anti-Alk.Phosphatase) ABC (Avidin-Biotin Conjugate) systems; employing monoclonal and polyclonal antibodies.

Be aware of the limitations of immuno-histochemistry.

### **e) Molecular Biology Knowledge**

Should understand the principles of molecular biology especially related to the understanding of disease processes and its use in various diagnostic tests.

Should be conversant with the principle and steps and interpretation of Polymerase Chain Reaction (PCR), Western Blot, Southern Blot, Northern Blot and Hybridisation procedures.

**f) Cytogenetics Knowledge**

Demonstrate familiarity with methods of Karyotyping &Fluorescent in-situ Hybridisation (FISH).

**g) Tissue Culture Knowledge**

Demonstrate familiarity with methods of tissue culture.

**h) Principles of Medical Statistics Knowledge**

Demonstrate familiarity with importance of statistical methods in assessing data from patient material and experimental studies.

**V. TEACHING AND LEARNING METHODS**

**Post Graduate Training**

**Teaching methodology**

Based on the available facilities, the Department will prepare a list of post graduate experiments pertaining to basic and applied Pathology.

Active learning will be the mainstay of post graduate training; there will be lectures for post graduates (at least 20 per year), along with seminars, symposia, group-discussions and Journal clubs. 1 seminar, 2 slide seminars,1 small group discussion and 1 journal club per week.

The post graduate students will regularly do the ward rounds of various clinical departments and learn cases of interest for discussion with the clinical faculty.

<b>Academic Programme</b>	<b>No. of hours</b>
Journal presentation	43 hrs
Slide seminars	64 hrs
Small case discussions	22hrs
Topic seminars	43 hrs

**Rotation:**

**Postings to laboratories/assignments**



The three-year training programme for the MD degree will be arranged in the form of postings to different assignments/laboratories for specified periods as outlined below. The period of such assignments/postings is recommended for 35 months. Posting schedules will be modified depending on needs, feasibility and exigencies. For facilities not available in the parent institution as well as for additional knowledge and skill, extramural postings will be undertaken.

**Section/Subject      Duration in months**

(i)	Surgical Pathology, Autopsy & Pathology Techniques-----	12 months
(ii)	(ii) Haematology & Laboratory Medicine-----	10 months
(iii)	Cytopathology-----	07 months
(iv)	Transfusion Medicine/Blood Bank -----	01 months
(v)	Museum techniques & record management-----	15 days
(vi)	District hospital posting -----	03 months
(vii)	Special advance techniques including Immunopathology, Electron microscopy, Molecular Biology (RTPCR/PCR, Cytogenetics including FISH and any other Research Techniques-----	45 days

**Total ----- 35 months**

The training programme will be designed to enable the student to acquire a capacity to learn and investigate, to synthesize and integrate a set of facts and develop a faculty to reason. The curricular programmes and scheduling of postings will provide the student with opportunities to achieve the above broad objectives. Much of the learning will be accomplished by the student himself. Interactive discussions are preferred over didactic sessions. The student will blend as an integral part of the activities of an academic department that usually revolves around three equally important basic functions of teaching, research and service.

The following are the guidelines for teaching/learning activities that will be employed.

- Collection of specimens including Fine Needle Aspiration of lumps.
- Grossing of specimens.
- Performing autopsies.
- Discussion during routine activities such as during signing out of cases.
- Presentation and work-up of cases including the identification of special stains and ancillary procedures needed.
- Clinico-pathological conferences.
- Intradepartmental and interdepartmental conferences related to case discussions.
- Conferences, Seminars, Continuing Medical Education (CME) Programmes.
- Journal Club.
- Research Presentation and review of research work.

- A postgraduate student of a postgraduate degree course in broad specialities/super specialities will do one poster presentation, read one paper at a national/state conference and present one research paper which will be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him/her eligible to appear at the postgraduate degree examination.
- Participation in workshops, conferences and presentation of papers etc.
- Laboratory work.
- Use and maintenance of equipment.
- Maintenance of records. Log books to be maintained to record the work done which will be checked and assessed periodically by the faculty members imparting the training.
- Postgraduate students will participate in the teaching and training programme of undergraduate students and interns.
- Postgraduate students will get involved e-learning activities.

**During the training programme, patient safety is of paramount importance; therefore, skills will be learnt initially on the models, later performed under supervision followed by performing independently; for this purpose, accordingly skill laboratories are provided for the same.**

## **VI. ASSESSMENT**

### **FORMATIVE ASSESSMENT, ie., during the training**

Formative assessment will be continual and will assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

### **General Principles**

Internal Assessment will be frequent, cover all domains of learning and used to provide feedback to improve learning; it will also cover professionalism and communication skills. The Internal Assessment will be conducted in theory and practical/clinical examination once a year apart from assessment during topic seminar, journal club, slide discussions and small case group discussions.

### **Quarterly assessment during the MD training will be based on:**

- 1. Journal based / recent advances learning**
- 2. Patient based / Laboratory or Skill based learning**
- 3. Self-Directed learning and teaching**
- 4. Departmental and interdepartmental learning activity**
- 5. External and Outreach Activities / CMEs.**

**The student will be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)**

**Internal assessment :** Periodically theory as well as practical assessment of the candidate shall be done once in an year. The marks obtained in these examinations will not be considered for the university examinations.

**SUMMATIVE ASSESSMENT, i.e., Assessment at the end of training:**

The summative examination will be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 amended from time to time.

**Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination , by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three concerned examiners.
5. Online course on Basic Research Methods :

The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

## **FORMAT OF THE EXAMINATION:**

The Post Graduate examination shall consist of three parts; Thesis, Theory and Practical/Oral Examinations.

### **1. Thesis:**

Every post graduate student will carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which will be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.
- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.
- Thesis will be submitted at least six months before the Theory and Clinical / Practical examination.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II) .
- For MD/ MS Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.

- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

## 2. Theory:

There shall be four theory papers, each of 3 hours duration. Question paper pattern shall be 10 Questions of 10 marks each without choice.

### NAMES OF THE PAPERS:

**Paper I:** General Pathology, Pathophysiology & Immunopathology -----100marks

**Paper II:** Systemic Pathology (histopathology+ Cytopathology) -----100 marks

**Paper III:** Haematology, Transfusion Medicine (Blood Banking) and Laboratory Medicine-----100 marks

**Paper IV:** Recent advances and applied aspects-----100 marks

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.
- Moderation of Question Papers :  
A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;
  - One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
  - Controller of Examinations
  - Dean

## 3. Practical's/Clinical and Oral/viva voce:

Practical examination for the subjects in Basic Medical Sciences shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/Laboratory studies and his ability to perform such studies as are relevant to his subject.

The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

**The practical/clinical examination consists of the following and will bespread over two days.**

- i) **Clinical Pathology:** Discussion of a clinical case history. Plan relevant investigations of the above case and interpret the biochemistry findings. Two investigations has to be performed including at least one biochemistry exercise/clinical pathology exercise like CSF, pleural tap etc.analysis and complete urinalysis.
- ii) **Haematology:**2Haematology cases preferably haemolytic anaemia and 1 case pertaining to coagulationwill be discussed with the given relevant history. Student has to Plan relevant investigations, perform complete haemogram and at least two tests preferably including one coagulation exercise. Identify electrophoresis strips, osmotic fragility charts etc. Interpretation of data from auto analysers, HPLC and flow cytometry. Examine, report and discuss around 8 cases given the history and relevant blood smears and/or bone marrow aspirate smears and bone marrow biopsy interpretation.
- iii) **Transfusion Medicine:** Perform blood grouping. Perform the necessary exercise like cross matching, Coomb's testand gel cards interpretation.
- iv) **Histopathology & Cytopathology:**Examine, report and discuss 14 cases of histopathology and 8 cytopathology cases, given the relevant history and slides. Perform a Haematoxylin and Eosin stain and givenonespecial stain on a paraffin section. Should be conversant with histopathology techniques including cryostat.
- v) **Autopsy:** Given a case history and relevant organs without slides, give a list of anatomical diagnosis in autopsy case.
- vi) **Gross Pathology:** Describe findings of gross specimens, give diagnosis and identify the sections to be processed. The post graduate student will perform grossing in front of the examiners for evaluation.
- vii) **Anciliary techniques:** 10 spotters based on basic sciences will be included. Identify electron micrographs,Identify gels, results of PCR, immunological tests includinginterpretation of Immunofluorescence pictures. Identify histochemical and immuno-histochemistry stains.

Teaching exercise (pedagogy) 10 minutes

Practical exercises will be evaluated jointly by all the examiners (4).

**Oral/Viva Voce:**

An oral question-answer session will be conducted at the end of each exercise.

- (a) Viva on dissertation and research methodology
- (b) General Viva-Voce.

**Practical's& viva-voce -----300 marks**

- i) Autopsy----- 20 marks.
- ii) Gross specimens (4x5)----- 20 marks.
- iii) Histo-techniques( section cutting & H&E staining)--10 marks.
- iv) Special stain----- 5 marks.
- v) Pap stain ----- 5 marks.
- vi) Clinical pathology&Haematology-----25 marks.
- vii) Haematology slides ----8x5----- 40 marks.
- viii) Histopathology slides----14x5----- 70 marks
- ix) Cytology slides-----8x5----- 40 marks.
- x) Spotters ----- 20 marks.
- xi) Pedagogy----- 10 marks.
- xii) Thesis discussion----- 25 marks.
- xiii) General viva voce----- 10 marks.

Total marks (Theory+ Practical's)-----400+300 marks.

**Marking System for the Examination:**

- i) The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training.
- ii) Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
- iii) Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
- iv) Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

**Appointment of Examiners:**

- i) No person shall be appointed as an internal examiner in any subject unless he/she has 3yrs experienceas recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
- ii) If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
- iii) An examiner shall ordinarily be appointed for not more than two consecutive terms.

- iv) The internal examiner in a subject shall not accept external examiner ship for a college from which external examiner is appointed in his subject.
- v) For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .

There shall be a panel of 8 External Examiner as advised by the HOD concerned. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

### **Recommended Reading:**

#### **Books (latest edition)**

#### **General pathology:**

##### **i) Robbin's text book. Kumar, Abbas & Aster Surgical/Histopathology**

- Rosai and Ackerman's Surgical Pathology. John R.Goldblum, Lauraw. Lamps, Jesse k.Mckenney, Jeffrey L.Myers.
- Sternberg's Diagnostic surgicalpathology. Stacey E. Mills, Joel K.Greenon, Jason L.Hornick, Teri A .Longacre, Victor E.Reuter.

##### **ii) Systemic pathology(individual systems)**

- Lever's Histopathology of skin. Rosalie Elentases, MishaRosenbach, George F.Murphy, Adam I.Rubin,XiaoweiXu.
- Novak's Gynaecologic and Obstetric Pathology with Clinical and Endocrine Relations. Edmund R. Novak, James Donald Woodruff.
- Atlas and Text of Haematology by Tejinder Singh
- Orell's Atlas of Aspiration Cytology. Svante R Orell,Gregory F Sterrett
- Bone Pathology. Henry L. Jaffe
- Mac Sween's Pathology of the liver. Alastair Brut, Linda Ferrell, Stefan Hubscher
- Iochim's Lymph Node Pathology. Harry L. Ioachim, L.Jeffery Medeiros.
- Text Book on Breast Pathology. Fattaneh A.Tavasoli
- Text Book on Thyroid Pathology by Geetha Jayaram
- Theory and Practice of Histological Techniques by Bancroft. S. Kim Suvarna Christopher Layton John D. Bancroft.
- Diagnostic Cyto pathology. Winifred Gray, Gabrijela Kocjan.
- Dacie's Practical Haematology. Barbara Bain, Imelda Bates, Mike Laffan.
- Wintrobe's Haematology. John P Greer,Goerge M Rodger's, BertilGlader,Daniel A Arber, Robert T Means, Alan F List, Fredrick R Appelbaum,Angela Dis penzieri, Todd A Fehniger.
- Heptinstall's Pathology of the Kidney. J.Charlesjennette, Jean L.Olson,Fred G.Silva, Vivette D D'Agati.



- Enzinger's & Weiss's Soft Tissue Tumours. John R. Goldblum, Andrew L. Folpe, Sharon W. Weiss

**International Journals (3-5) & national (2) journals (All indexed)**

1. Lancet
2. New England Journal of Medicine
3. Nature science
4. Modern Pathology
5. American Journal of Surgical Pathology
6. Histopathology
7. Human Pathology
8. Journal of Pathology
9. ActaCytologica
10. Cancer cytopathology
11. Diagnostic cytopathology
12. Cytopathology
13. Journal of Clinical Pathology
14. Journal of cytology
15. Indian Journal of Pathology and Microbiology
16. British Journal of Haematology
17. Blood
18. Cancer.
19. All other relevant sub-speciality journals
20. WHO Blue books
21. AFIP Fascicles

**Annexure 1**

### Postgraduate Students Appraisal Form

Pre / Para / Clinical Disciplines

Name of the Department/Unit:

Name of the PG Student:

Period of Training: FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1	1. Journal based / recent advances learning				
2	2. Patient based /Laboratory or Skill based learning				
3	3. Self directed learning and teaching				
4	4. Departmental and interdepartmental learning activity				
5	5. External and Outreach Activities / CMEs				
6	6. Thesis / Research work				
7	7. Log Book Maintenance				

Publications Yes/ No

Remarks\* \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD

Annexure - II  
Plagiarism  
**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**  
(A University established by an Act of A.P. State Legislature)

**GUIDELINES FOR 'PLAGIARISM' CHECK**  
**WHILE SUBMISSION OF THESIS/DISSERTATION BY**  
**DM/M.Ch/MD/MS/Ph.D students**

**Ref.: Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/MS/ DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for Theses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian,SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr A.Omkar Murthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.

6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga - INFLIBNET)
  - b. Second file: should contain the thesis from **“Introduction”** to **“Conclusion/result”** part of the thesis/dissertation (for plagiarism check)
  
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
  
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

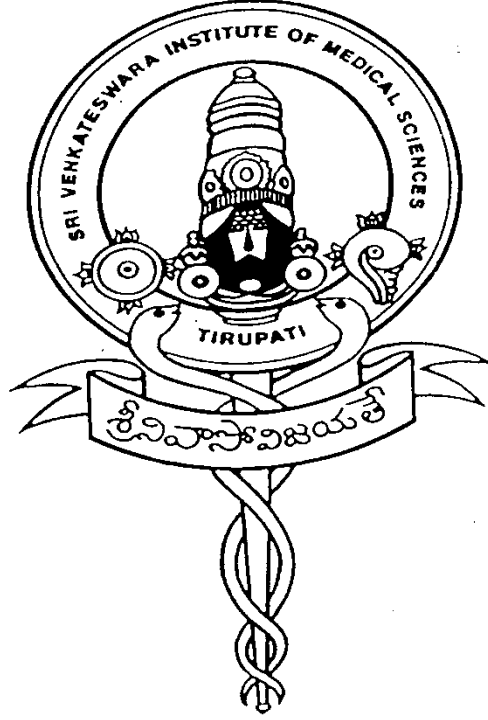
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## LOG BOOK

DATE	8-9AM	9-1PM	1-2PM	2--4PM
2-8-21	JOURNAL CLUB	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	MBBS Practicals/Grossing/BM aspiration/ Cytology reporting/MLT/Nursing/ Physiotherapy classes
3-8-21	HISTO SLIDE SEMINAR	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	MBBS Practicals /Grossing /BM aspiration/ Cytology reporting/MLT/Nursing/ Physiotherapy classes
4-8-21	TUMOR BOARD DISCUSSION	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	Grossing/BM aspiration/ Cytology reporting/ MLT/Nursing/ Physiotherapy classes
5-8-21	TOPIC SEMINAR	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	Grossing/BM aspiration/ Cytology reporting/ MLT/Nursing/ Physiotherapy classes/ CASE PRESENTATION
6-8-21	CYTO&HAEMAT O SLIDE SEMINAR/ SMALL CASE GROUP DISCUSSION	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	Grossing/BM aspiration/ Cytology reporting/ MLT/Nursing/ Physiotherapy classes
7-8-21	CLINICAL RESEARCH PRESENTATION	REPORTING HISTO/CYTO /HAEMAT& FROZEN	MBBS Theory class	Grossing/BM aspiration/ Cytology reporting/ MLT/Nursing/Physiotherapy classes

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES  
TIRUPATI - 517 507**

(A University established by an act of Andhra Pradesh State  
Legislature)



**COMMONBOARD OF STUDIES MEETING**

**M.D. Radiotherapy**

**on 21.07.2021**

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**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES  
TIRUPATI**

M.D. RADIOTHERAPY COURSE

COMMONBOARD OF STUDIES MEETING HELD ON 21/07/2021

**I N D E X**

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SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES:: TIRUPATI

MD Radiotherapy Course

COMMON BOARD OF STUDIES MEETING

List of members

1. Dr B. Siddhartha Kumar - Chairman  
Dean, SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar, SVIMS, Tirupati.
3. DrV. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr Joseph Benjamin - External expert  
Prof. & HoD  
Dept. of Radiotherapy  
MNJ Cancer Centre  
Red Hills, Hyderabad-500 080
5. Dr B.V. Subramanian - Internal expert  
Professor & HoD  
Dept. of Radiotherapy  
SVIMS, Tirupati
6. Dr Pranabandhu Das - Internal expert  
Associate Professor  
Dept. of Radiotherapy  
SVIMS, Tirupati



**GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING  
PROGRAMME FOR M.D., IN RADIOTHERAPY**

(As prescribed by MCI, 2018)

\*\*\*

**I. AIMS & OBJECTIVES**

**General:**

The aim of the training is to enable the trainee capable of practicing independently as a competent doctor. The trainee should be compassionate and ethical in their practice of oncology and would also contribute to the future developments in oncology.

**Specific:**

- a. The trainees should acquire a sound working knowledge of the use of ionizing radiation, cytotoxic agents, hormones, biological response modifiers, etc. in the management of cancer.
- b. The trainees practice "Evidence Based Medicine" whenever possible, and be familiar with Clinical Trial Methodology.
- c. The trainees should become competent in providing and organizing a comprehensive supportive and palliative care in patients with very advanced disease and in terminally ill patients.
- d. The trainees should develop the ability of reasoning/logical thinking and decision making in grey areas and in difficult cases.
- e. The trainees should become competent to provide guidance and leadership in the "Cancer Prevention Efforts".
- f. The training should generate awareness and interest in basic and applied cancer biology and whenever possible, experience in the field.
- g. The trainees should develop leadership qualities and learn basic management and administration skills.

The induction programme is intended to give the new trainees a general idea about SVIMS, the nature of work done in various departments and the location of various departments within the five inter connected buildings of SVIMS. The emphasis will be on the departments of Radiotherapy, Medical Physics and frequently used diagnostic and rehabilitative services. The Senior Registrar will introduce and guide the new students to various facilities listed below.

- 1) Teletherapy Machines (To know about the machines available in the hospital; Energy, accessories, types of treatment possible & operating.)
- 2) Brachytherapy Machines, Theatre (Types of procedure one LDR, HDR,

- Manual, Remote etc.; Care and special instruction taken during loading and removal of radioactive sources, Learn about radiation protection measures, know the procedures such as CVS,VSA and intracavitary).
- 3) Computer Treatment Planning, Physics (Simple plans, isodosecharts)
  - 4) Mould Room & Simulator (Making POP, a crylic and thermoplastic moulds, Alloy blocks, Styrofoamcutter, Tissue compensators, Bolus and surface moulds)
  - 5) Radiotherapy In-patients: (Visit towards, patient management with IV fluids, care of patients admitted towards, management of radiation reactions general aspects)
  - 6) Daycare: Various investigations, IV access & chemotherapy administration.
  - 7) Other rehabilitative services such as Palliative care, Occupation a land physiotherapy, Medical Social Workers
  - 8) Institutional Ethics Committee
  - 9) Radio-diagnosis department and Nuclear Medicine department
  - 10) Histopathology, microbiology, biochemistry and blood bank.
  - 11) Main operation theatre and ICU.

## II. REGULATIONS

- a) **Eligibility for admission:** A candidate seeking admission into the course shall have MCI / NMC recognized MBBS qualification.
- b) **Admission:** In order to be **eligible** for admission to any postgraduate course in a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in 'National Eligibility-cum- Entrance Test for Postgraduate courses' held for the said academic year.
- c) **All the students should get their degree registered with AP state medical council before completion of first semester.**
- d) **Duration of the course:** The duration of the course shall be three calendar years (including the period of examination).
- e) **Bond:**
  - i) The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/- value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. 5,00,000/- (**Rupees Five Lakhs only**) along with the full stipend amount received by him/her back to the Institute.

ii) The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.20,00,000 (Rupees Twenty lakhs only).

f) **Training Programme:** The candidate joining the course must work as full time Resident during the period of Post Graduate Training.

**Note:** In-Service candidate will not be paid stipend if He / She draws leave salary in that parent institution.

g) **Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

h) **Attendance:** All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

### **PLAGIARISM**

Plagiarism- the thesis will be checked for plagiarism as according to University regulations

**Teaching/Learning Methods:**

Learning in MD (Radiotherapy) course shall essentially be self-learning.

**Group teaching sessions:**

- Journal review
- Subject seminar presentation
- Group discussion
- Clinical care presentations pertaining to Radiotherapy
- Presentation of the finding of an exercise on any of the sub-specialties
- Participation in CME programme and conferences
- Tumor board participation

- a) Lectures in Radiation Physics, Radiation Protection and Quality Control
- b) Case Discussions, Seminars, Journal Club Presentations, tumor board.

**Posting Schedule**

<b>I year</b>	<b>II year</b>	<b>III year</b>
Ward posting OPD posting	Ward posting OPD posting	Ward posting OPD posting
Peripheral posting	Simulator Planning & Brachy	Simulator Planning & Brachy

**1. Peripheral Postings**

**a) Internal:**

**During 1<sup>st</sup> year:** 1 month - which includes Medicine and Surgery 15 days each

**During 2<sup>nd</sup> year:** 2 months which includes Pathology, Nuclear Medicine, Radiodiagnosis, Medical Oncology - 2 weeks each

- b) **External:** During 2<sup>nd</sup> year 1 month external posting is allowed to a centre where the Cobalt unit and advanced facilities are available as per the decision of the HoD.

**c) DISTRICT RESIDENCY PROGRAMME (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as "District Residency Programme (DRP)" and the postgraduate medical student undergoing training shall be termed as a "District Resident".

**2. Hands on experience (practical training):**

Practical training shall be imparted by posting student in various subspecialties (sections) as detailed in the intrinsic and extrinsic rotation. Student shall be actively involve in day to day working of all the sections.

He/ She will be trained under the guidance of teachers in all the aspects of practice of Clinical Radiotherapy.

**3. Maintenance of Log Book:**

Each candidate should maintain a log book in which the following details will be entered:

1. Treatment planning and procedures performed
2. Presentation in departmental seminars
3. Cases presented in clinical meetings
4. Presentations in journal clubs along with Title, Journal & Issue..
5. Schedule of intradepartmental rotation
6. Details of peripheral postings
7. Conferences attended - National/International
8. Papers presented at conferences with title name of the conference, date of presentation
9. Paper published with title, name & issue of the journal

The log book shall be verified periodically i.e. once in a month or as per the MCI norms by the guide.

**III. ASSESSMENT**

**A. Formative assessment:**

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

**General Principles:**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching

4. Departmental and interdepartmental learning activity

5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form. The results of formative assessment should be maintained in the student appraisal form itself and communicated in the same format to the Examination Section while applying for the Summative Examination.

**Internal Assessment and evaluation:**

Internal assessment shall be in reality be done every day to assess the training and to identify the weakness as well as strength of the candidate.

- a) Log book with details of duration of postings, skills performed with remarks of the teacher faculty member
- b) The research work to be assessed or reviewed every six months
- c) Evaluation sheets for seminar and journal clubs
- d) Time scheduling
- e) Overall performance

**B. Summative Assessment :**

**Summative Assessment** ie., assessment at the end of training . The summative examination would be carried out as per the Rules given in Postgraduate Medical Education Regulations, 2000 as amended from time to time. The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

**Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms).An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall

attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfill attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.

**3. Paper publication:**

A postgraduate student would be required to present one poster presentation, to read one paper at a national / state conference and to present one research paper which should be published / accepted for publication / sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination as per MCI regulations amended from time to time.

4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three concerned examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

**IV. EXAMINATIONS**

The examinations shall be organized to evaluate and certify candidate level of knowledge, skill and competence at the end of the training. The examination for MD in Radiotherapy shall be held at the end of 3<sup>rd</sup> academic year

**Format of the Examination:**

Postgraduate examinations, in any subject shall consist of Thesis , Theory Papers, and Clinical/Practical and Oral examinations.

**1. Thesis:**

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the

latest advances in medical science and the manner of identifying and consulting available literature.

**Guide:**

The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

**Co-guide:**

- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the by the Head of the department. The co-guides shall be limited up to two numbers.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD with **plagiarism clearance** report as per university regulations(for detailed regulations see the Annexure -I).
- to the Controller of Examinations, six months before the Theory and Clinical / Practical examination. Those students who have not submitted the thesis as per regulations shall not be allowed to appear for the final examination.
- For MD/ MS Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical/ Practical & Viva examination. Internal examiner for thesis shall not be Guide or Co-guide for the thesis.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.

**2. Theory:**

i. There shall be four theory papers, each of 3 hours duration.

**Paper I-** Radiation Physics, Radiobiology, Basic Medical Sciences related to Oncology and Principles of Oncology

**Paper II -** Applied Clinical Radiotherapy



**Paper III-** Chemotherapy, Targeted Therapy in combination with Clinical Radiotherapy

**Paper IV-** Recent Advances in Radiotherapy and Oncology

**Model of the Examination:**

**New pattern:**

The pattern of the question paper is modified as follows for the students admitting from 2016-17 batch appearing the examination during May 2019.

**100 Marks for each paper**

**Each question carry 10 marks**

**No. of questions - 10**

**Choices - Nil**

**Paper I:** Radiation Physics, Radiobiology, Basic Medical Sciences related to Oncology and Principles of Oncology

**Paper II:** Applied Clinical Radiotherapy

**Paper III:** Chemotherapy, Targeted Therapy in combination with clinical Radiotherapy

**Paper IV:** Recent Advances in Radiotherapy and Oncology

ii) The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.iii) Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh **who may or may not be involved in the clinical/practical examination.**

iii) The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.

**iv) Moderation of Question Papers :**

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers

- One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
- Controller of Examinations
- Dean

### 3. Practical / Clinical

Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.

The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

The components of **Practical / Clinical examination:** (200 Marks)

**Long Case:** (100 Marks)

1. Case Documentation-----30 marks
2. Patient Examination -----30 marks
3. Differential Diagnosis-----10 marks
4. Case discussion----- 30 marks

**Short Case:** (50 Marks)

1. Case Presentation and examination----20 marks
2. Differential Diagnosis-----10 marks
3. Case discussion----- 20 marks

**Spotters- Identification and Description:** (50 Marks)

1. Pathological specimens-----10 marks
2. X-ray films, CT and MR Images----10 marks
3. Isodose charts-----10 marks
4. Cases-----10 marks
5. Instruments and Applicators-----10 marks

### 4. Oral/Viva (100 Marks)

The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination

### 5. Marking System for the Examination:

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.

3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

**6. Appointment of Examiners:**

1. All the Postgraduate examiners shall be recognized Postgraduate teachers holding recognized Postgraduate qualification in the subject concerned and satisfy the requisite experience as per MCI regulations amended from time to time.
2. The teachers in a medical college or institution having a total of 8 years teaching experience out of which at least 4 years teaching experience as Assistant Professor with two research publication in indexed journals gained after obtaining postgraduate degree shall be recognized post graduate teacher in broad specialties.
3. No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject.
4. For external examiners, he or she should have minimum 6 years of experience as recognized PG teacher in the concerned subject.
5. An examiner shall ordinarily be appointed for not more than 2 consecutive terms.
6. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.
7. For all post Graduate examinations, the minimum number of examiners shall be Four, out of which two (50%) shall be external examiners, who shall be invited from other recognized universities/institution from outside the state.
8. Two internal examiners will be appointed within the institution. If the internal examiners are not available within the institution, the institute can appoint any eligible internal examiners as recommended by the HOD within the state or outside the state.
9. Theory paper setting to be done by the examiners from outside the state of Andhra Pradesh who may or may not involved in the concerned Clinical / Practical examination.
10. No. of Examiners Required -Four  
    No. of Internal Examiners -Two (HoD and one eligible PG Teacher)  
    No. of External Examiners -Two
11. There shall be a panel of 8 External Examiner as advised by the HOD concerned.
12. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

## V. SYLLABUS

### FIRST YEAR

Candidates are expected to have wide knowledge of malignant diseases and the management of patients with cancer. The first year candidate also has good and depth in the knowledge of Physics and Radiobiology. Hence SVIMS university Department of Radiotherapy first year finishes Physics & Radiobiology.

#### MEDICAL PHYSICS RELATED TO RADIOTHERAPY

##### 1. BASIC CONCEPTS

Units - Rind mental units - Derived Units -Electrical Units - Radiation Units.  
Atoms - Nucleus - Atomic Number - Mass number - Isotope -  
NuclearStructure - energy levels Binding energy - electromagneticradiation -  
Quantum nature of Radiation - Radiation energy from anatom.

##### 2. NUCLEAR PHYSICS

Radio activity - Units of Activity - Exponential decay - half life -  
transformation constant - disintegration - Beta minus decay - Beta plus  
decay - Electron capture - Internal conversion - Auger electronic Isometric  
transitions - Fission - Fusion - Nuclear - reactors Activation of Isotopes.

##### 3. INTERACTION OF RADIATION WITH MATTER

###### (1) Photo interaction.

Absorption of energy - Linear attenuation - co - efficient - Half value layer -  
mass, electronic and atomic attenuation co - efficient - energy transfer and energy  
absorption - Photo electric absorption Compton scattering - pair production -  
total attenuation co - efficient - Relative importance of different types of  
interactions.

###### (2) Particle interaction

Electron interaction - Ionizational losses - Bremsstralung losses - Range of  
electrons -Electron - Electron spectrum - energy specification - stopping power -  
LET particles for radiotherapy.

##### 4. PRODUCTION OF X-RAYS

X-ray Production - X-ray circuit Diagnostic X - ray tubes X - ray tubes for  
Radiotherapy X- rays spectron - interactions of electron with the target  
Angular distribution of X- rays - quality of X - rays - filters - HVL.

##### 5. HIGH ENERGY MACHINES

Isotope machines – cobalt 60 unit source housing – beam Commission – penumbra cesium 137 – Betatron – Linear accelerator (detailed study) – microtron – Recent development.

## 6. RADIATION DOSIMETERY

Fluence – kerma and absorbed dose – electronic equilibrium – Bragg Gray cavity principl. Exposure – Roentgen standard air chamber – Thimble chamber – condenser chamber – Farmer – chamber – Secondary standard doscimeter – Inverse square law – Thermoluminescent doscimeter – Chemical doscimeter – film as a doscimeter.

## 7. BEAM THERAPY

Phantoms percentage depth dose – Tissue air ratio – Back scatter factor – Tissue Phantom rations – Tissue maximum ratios – equivalent squares for rectangular fields – Isodose curves – Paramelions and Iso Dose energy – Comparison of Isodose curve of cobalt 60 with high energy beams – wedge filters – integral dose – choice of radiation beam.

## 8. TREATMENT PLANNING

Patient dose calculation – treatment time calculation – SSD and SAD Technique – Body contours – centours – corrections – for tissue in homogeneities – corrections for surface obliquities – tissue compensators. Dose distribution – opposing pairs of beams – three field techniques – Rotation therapy – Wedge pairs – open and wedge field combinations. Preparation of mould – shielding blocks – Styrofoam cutting machine – simulator and its application – Role of CT and Ultrasound in treatment planning.

## 9. BRACHYTHERAPY

Brachytherapy sources Radium 226 – cesium 137 – cobalt 70 – Iridium 192 – Gold 198 – Iodine 125 – Physical characteristics – source production – storage and transport facility. Implant technique – types of implant – Patterson – parker system – Patterson – parket tables – determination of implant area – radiographic examination of implants – orthogonal imaging method stereo shift method – After leading technique Iridium 192 implant permanent implants – clinical examples of dose calculation. Intracavitary application – paris technique – Stockholm technique – Manchester system – Dose specification – Point A and Point B – leading arrangement – Applications – Manual after leading systems – Computer Dosimetry – examples of dose calculation. Recent developments in Brachytherapy.

## 10. RADIATION PROTECTION

Biological effects of radiation – sematic and Genetic effects – immediate and late effects – evaluation of radiation hazards – personnel monitoring – film badge

pocket decimeter – TLD – Area monitoring survey meters – survey procedures – quality assurance in radiotherapy.

Maximum permissible dose – historical review – Radiation protection rules in India – ICRP recommendations – dose equivalent Limits – quality factor – Sivertz.

Planning of Radiotherapy department – work load – occupancy factor – use factor – protection from primary radiation protection against leakage radiation and scattered radiation – Design considerations for accelerator facility.

Guidelines for safe work practice – recent development in radiation protection.

### PHYSICS PRACTICALS

1. Range of beta particles.
2. Gamma ray spectrum.
3. Output measurement in a Linear accelerator.
4. Determination of optical and radiation field congruence.
5. Rectal Dose measurement.
6. Verification of Inverse square law.
7. Familiarization of computerized treatment planning system.
8. Familiarization of simulator.
9. Radiation survey in a Teletherapy facility.
10. Radiation survey a Branchy therapy facility.
11. Dose simulation in multi field with open field and wedge fields.
12. Quality assurance in Radiotherapy.
13. Uptake studies with Gamma camera and scanners.

### CLINICAL PRACTICES OF RADIOTHERAPY

- A. Principles of Radiotherapy
- B. Techniques of Radiotherapy
- C. Effects of Irradiation of the Lung
- D. Effects of Irradiation of Nervous Tissues
- E. Effects of Irradiation of the Ovary
- F. Effects of Irradiation of the Testis
- G. Effects of Irradiation of the Eye
- H. Effects of Irradiation of Lymphoid Tissue
- I. Effects of Irradiation of the Bone Marrow
- J. Effects of Irradiation of the Oral, Pharyngo laryngeal and Esophageal Mucus Membrane
- K. Effects of Irradiation of the Salivary Glands

RADIOBIOLOGY

1. Radiobiology and Laboratory Radiotherapy
2. Factors That Modify Radiation Response
3. Linear Energy Transfer
4. Relative Biological Effectiveness
5. Cell and Tissue Kinetics
6. Tissue Radio sensitivity
7. Time - Dose and Fractionation
8. Hyperthermia
9. Total Body Irradiation - Acute Effects
10. Late Effects
11. Radiation Effects in the Developing Embryo and Fetus
12. Radio physiology of Human Tissues

SECOND YEAR

2. PRINCIPLE OF ONCOLOGY

2.1 Etiology of Cancer

- a) Genetic predisposition, congenital syndromes
- b) Chromosomal abnormalities, hereditary tumors
- c) Proto-oncogene, oncogenes, tumor suppressor genes,
- d) Multifactorial causation
- e) Nutritional aspects in cancer causation and prevention.
- f) Environmental causes of cancer
- g) Biological - protozoal, bacterial, viral
- h) Chemical - Classes of carcinogenic chemicals, smoking
- i) Physical - trauma, irradiation (UV rays, other electromagnetic radiation including X rays and Gamma rays and particulate radiations)
- j) Occupational cancers.

2.2 Epidemiology of Cancer

2.3 Cancer Screening and Prevention

2.4 Cancer Registries & National Cancer Control Programme

## 2.5 Cancer Chemotherapy

- a) Classification and mode of action of cytotoxic drugs
- b) Pharmacokinetics and Pharmacodynamics
- c) Principles of combinations of therapy, dose response curves, sequential and concomitant chemotherapy, sanctuary sites, high dose chemotherapy, and regional chemotherapy
- d) Standard chemotherapy schedules
- e) Drug administration and Precautions in the safe handling of cytotoxic drugs
- f) Drug Toxicity
- g) Supportive care for chemotherapy
- h) Resistance to Chemotherapy
- i) Basic concepts of Chemotherapy and Irradiation Interaction

## 2.6 Cancer Bio therapeutics

- a) Hormonal Therapy
- b) Differentiation Agents
- c) Monoclonal Antibodies
- d) Interferons
- e) Interleukins
- f) Anti angiogenesis Agents
- g) Molecular Targeted Therapy
- h) Vaccines
- i) Gene Therapy

## 2.7 Imaging in Oncology

## 2.8 Pharmacogenomics

### THIRD YEAR

## 3. CLINICAL RADIOTHERAPY, CHEMOTHERAPY AND TARGETED THERAPY IN MANAGEMENT OF MALIGNANCIES

### 3.1 Skin Cancer

### 3.2 Central Nervous System Tumor

### 3.3 Head and Neck Tumors

### 3.4 Thoracic Tumors

### 3.5 Breast Tumors

### 3.6 Gastrointestinal Tumors

### 3.7 Liver, Gall bladder and bile duct tumors

### 3.8 Pediatric Tumors



- 3.9 Gynecologic Tumors
- 3.10 Male Genitourinary Tumors
- 3.11 Urinary Tract Tumors
- 3.12 Endocrine Tumors
- 3.13 Lymphoma and Hematological Malignancies
- 3.14 Sarcomas of Bone and Soft tissues
- 3.15 Metastasis of Unknown Origin
- 3.16 AIDS related Malignancies
- 3.17 Oncologic Emergencies
- 3.18 Endocrine aspects of malignancy:- production of hormones by tumors, effect of hormones on tumors, paracrine effects of tumors
- 3.19 Paraneoplastic syndromes
- 3.20 Benign Diseases

#### 4. OTHER DISCIPLINES ALLIED TO RADIOTHERAPY AND ONCOLOGY

- 4.1 Surgical Oncology
  - 4.1.1 Basic principles of surgical oncology, biopsy, conservation surgery, radical surgery, palliative surgery
  - 4.1.2 Basics of surgical techniques - head & neck, breast, thorax, abdomen, gynecological, genitourinary, musculoskeletal, CNS
  - 4.1.3 Combined treatments: with radiotherapy, chemotherapy, and hormone therapy
- 4.2 Rehabilitation
- 4.3 Complementary alternative medicine

#### 5. PALLIATIVE CARE

- 5.1 Guidelines for palliative care
- 5.2 Symptoms of advanced cancer
- 5.3 Different pharmacologic & non-pharmacologic methods
- 5.4 Pain control, WHO guidelines for adults & children
- 5.5 Palliative radiotherapy
- 5.6 Palliative chemotherapy
- 5.7 Home care
- 5.8 Hospice care
- 5.9 Physical, social, spiritual & other aspects

#### 6. RESEARCH, TRAINING & ADMINISTRATION

- 6.1 Research in Oncology
  - 6.1.1 How to conduct a research

- 6.1.2 Guidelines for biomedical research: Animal studies, drug studies, human trial
- 6.1.3 Cancer clinical trials. Phase I/II, III
- 6.1.4 Ethics of clinical research
- 6.1.5 Evidence based medicine
- 6.2 Training Programme in Radiotherapy and Oncology
  - 6.2.1 Participation in the daily routine work of the department including work rounds of patients admitted for radiotherapy, symptomatic treatment for acute and late radiation reactions, administration of cytotoxic drugs, management of chemotherapy induced side effects and complications, cancer pain management and palliative care .
  - 6.2.2 Presentation of cases in the reporting sessions of the department
  - 6.2.3 Participation in various procedures and techniques (e.g. External Beam Radiotherapy- 2-D & 3- DCRT, IMRT; Brachytherapy- Interstitial, Intracavitary, Intraluminal, Surface; Simulation and Treatment Planning; Mould Room Procedures etc.)
  - 6.2.4 Active participation in the Tumor Board meetings with other departments for case discussions.
  - 6.2.5 Junior Residents in Radiotherapy must undergo 3 months peripheral postings in other specialities during their 3 years course towards M.D.
  - 6.2.6 Participation in CME-conference, symposium, workshop, seminar
  - 6.2.7 Active participation in teaching and training programme of undergraduate students.
- 6.3 Administration in Radiotherapy and Oncology
  - 6.3.2 Clinical Oncologist's role as an administrator.
  - 6.3.3 How to set up a Radiotherapy and Oncology department, planning of infrastructure, & equipments
  - 6.3.4 Role in cancer control programme.
  - 6.3.5 Responsibilities towards radiation safety & quality assurance.
  - 6.3.6 Administration aspects of training, academic, patient care & research.

VI. Model Question Paper

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI  
UNIVERSITY EXAMINATIONS

M.D. - RADIOTHERAPY

Paper 1: Radiation Physics, Radiobiology, Basic Medical Sciences related to  
Oncology And principles of Oncology

Date: 15.4.2021      Time; 3 Hours      Code; 47301      Maximum Marks: 100

**Instructions to the doctors: Answer all questions.  
Draw neat and labeled diagrams where necessary**

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- 1). Discuss the methods employed for immobilization of patient in Radiotherapy treatment planning 10
- 2.) What is universal wedge. Discuss physical aspects & clinical application of wedge filter . 10
- 3.) What are early & late reacting tissues & discuss LQ model along with clinical significance. 10
- 4).Discuss the biological factors determining the response of a tumor to radiation treatment. 10
- 5). What is percentage depth dose & factors influencing it. 10
- 6).What are the various interaction of radiation with matter . 10
- 7). Describe DNA damage by radiation. Define Radio sensitivity & radio curability. 10
- 8).Write notes on therapeutic radio, dose time factors & its impact on local tumor control 10
- 9). Enumerate the differences between LINAC & cobalt-60 Radiotherapy machine. 10
- 10). Define hyper fractionation & its radio biologic rationale. 10

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI  
UNIVERSITY EXAMINATIONS  
M.D. - RADIOTHERAPY**

**Paper 2: Applied Clinical Radiotherapy**

**Date: 17.4.2021      Time; 3 Hours      Code; 47302      Maximum Marks: 100**

**Instructions to the doctors: Answer all questions.  
Draw neat and labeled diagrams where necessary**

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- |  |    |
|--|----|
| 1). Discuss the management of Ca. Tonsil cT3N1MO   | 10 |
| 2). Discuss the Breast Conservation therapy in 40 years old female cT2NOMO                     | 10 |
| 3). Discuss the management of Ca. Cervix IIIB  | 10 |
| 4).Anatomy of maxillary antrum. Discuss the management of cT4N1MO of<br>Ca. Maxilla            | 10 |
| 5).Cranio Spinal irradiation   | 10 |
| 6). What is the role of RT In treatment of Ca Esophagus. Discuss technique of<br>RT in detail. | 10 |
| 7). Write short notes on :   |    |
| a) Radiation cystitis  |    |
| b) Radiation proctitis   | 10 |
| 8). Treatment of Stage IV non small cell Lung cancer.  | 10 |
| 9). Role of RT in Benign diseases .  | 10 |
| 10). Discuss the role of RT in Ca Anal canal. Add a Note on ACT-I & ACT-2 trial.               | 10 |

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUPATI  
UNIVERSITY EXAMINATIONS  
M.D. - RADIOTHERAPY**

**Paper 3: Chemotherapy, targeted therapy in combination with clinical radiotherapy**

**Date: 19.4.2021      Time; 3 Hours      Code; 47303      Maximum Marks: 100**

**Instructions to the doctors: Answer all questions.**

**Draw neat and labeled diagrams where necessary**

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- |   |    |
|---|----|
| 1). Write about indication, administration, side effects of cisplatin   | 10 |
| 2). Write about indications, routes of administration & side effects of 5-FU .  |    |
| Add note on capecitabine.   | 10 |
| 3). Write about mechanism of action, side effects, indication of methotrexate.  | 10 |
| 4). Anti Her-2 neu therapy in Breast cancer.  | 10 |
| 5). Write a note on Carmustine, Lomustine, Temozolamide .   | 10 |
| 6). Write about indications, administration, side effects of Doxorubicin. Add a Note on cardiotoxicity of anthracyclines. | 10 |
| 7). Rationale of combining chemotherapy with Radiotherapy in Head & Neck Cancer.  | 10 |
| 8). Risk factors of Ca. Ovary. How do you manage a patient of Ca. ovary with Ascites.                                     | 10 |
| 9). Principles of treatment in a case of stage-IV Rectosigmoid carcinoma.   | 10 |
| 10). Principles of Androgen deprivation therapy in carcinoma prostate.  | 10 |

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUPATI  
UNIVERSITY EXAMINATIONS  
M.D. - RADIOTHERAPY**

**Paper 4: Recent advances in Radiotherapy and oncology**

**Date: 22.4.2021      Time; 3 Hours      Code; 47304      Maximum Marks: 100**

**Instructions to the doctors: Answer all questions.**

**Draw neat and labeled diagrams where necessary**

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1).3D CRT	10
2).Image guided radiotherapy.	10
3). Indications (along with doses of RT) of SRS in clinical practice.	10
4).Intra operative radiotherapy.	10
5).Proton beam therapy.	10
6).Differences between LDR & HDR Brachytherapy. Clinical advantages of HDR over LDR.	10
7).Hyperthermia .	10
8).Write briefly about	10
a) Kaplan Meir curve	
b) Forrest plot	
9).Total body irradiation, indication & technique.	10
10). Write a brief note on	10
a) Radiosensitizers	
b) Radioprotectors	

## VII. BOOKS AND JOURNALS RECOMMENDED

### BOOKS

1. Liebelm and Philips text book of radiation oncology 3rd Edition (2010) Richard THoppe MD, FACR, FASTRO, Theodore Locke Philips MD, FACR, FASTRO, MackRoach III MD, FACR.
2. Perez and Brady's Principles and Practice of Radiation Oncology 5th Edition (2004)Edward C Halperin MD, MA, FACR, Carlos A Perez MD, Luther W Brady .
3. Cancer - Principles and Practice of Oncology 8th Edition, Vincent T De Vita, Jr. Theodore S, Lawrence, Steven A Rosenbergo, Stevven A.
4. Clinical Radiation Oncology (2007) Leonard L Gunderson, Joel E Tepper.
5. Bethesda Handbook of Clinical Oncology (2009) by Carmen J Allegra MD (Editor),Jame Abraham MD (Editor), James L Gulley MD (Editor).
6. Handbook of evidence based radiation Oncology 2nd Edition (2010) Dr. Eric KHansen, Dr, Mack Roach III.
7. Moss's Radiation Oncology: Rational, Technique, Results (1994) William ThomasMoss, and James Daniel Cox.
8. Text Book of Radiotherapy, Gilbert H Fletcher.
9. Treatment planning in Radiation Oncology 2nd Edition (2007) Faiz M Khan.
10. Oxford Handbook of Oncology, Jim Cassidy, Donald Bissett, Roy A J Spence Obe.
11. The Physics of Radiation Therapy: Mechanisms, Diagnosis and Management 3rdEdition by Faiz M Khan.
12. The Physics of Radiology 4th Edition (1983) HaoldElford Johns, John RobertCunningham.
13. Radiobiology for the Radiologist 6th Edition, Eric J Hall.
14. The Chemotherapy source Book 4th Edition, Michel C Perry.
15. Text Book of Medical Oncology 4th edition, Franco Cavalli, Stan B Kaye, Heine HHansen, James O Armitage, Martine J.
16. Surgical Oncology: Contemporary principls and Practice, K. I. Bland, John M Daly,Constantine P Karakousis.

### JOURNALS

1. International Journal of Radiation Oncology, Biology, Physics.
2. Annals of Oncology
3. British Journal for Cancer12
4. CA-A Cancer Journal for clinicians
5. Cancer
6. Cancer of clinical Oncology
7. Journal of Clinical Oncology
8. Journal of Cancer Research and therapeutics
9. Medscape Oncology
10. Seminars in Oncology
11. Seminars in Radiation Oncology
12. The Lancet
13. The new England Journal of Medicine

## VIII. Postgraduate Students Appraisal Form

### Pre / Para /Clinical Disciplines

\*\*\*

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM..... TO.....

Sl. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2.	Patient based / Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis/ Research work										
7.	Log Book Maintenance										

Publications

Yes/No

Remarks\*

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\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGN.OF ASSESSEE

SIGN.OF FACULTY I/C

SIGN.OF HOD

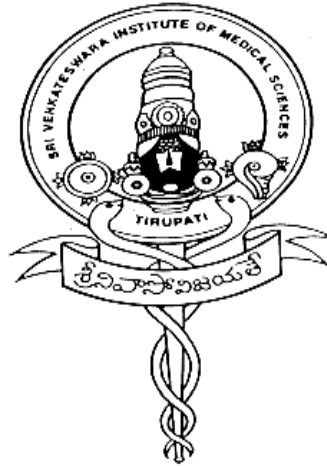


Appendix - 1

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,

(A University established by an Act of Andhra Pradesh Legislature)

TIRUPATI - 517 507



LOG BOOK

COMMON FOR MD/ DM/ M.Ch. POSTGRADUATES  
(Suitably modified for each specialty)

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :  
(Preferably be done by the faculty with whom the resident worked for mostpart of the period)

Quality being Assessed

1. Patient Evaluation
2. Academic Knowledge About Patients Problems
3. Curiosity about unexplained Observations
4. Patient Care
5. Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

Signature of the candidate

Signature of the guide

Signature of the HoD with seal





## SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

## JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Journal Review Presentations

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material , Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyse the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:  
 Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**CASES PRESENTED IN MORTALITY CONFERENCE (optional)**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED (optional)**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LAB PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>

**CONFERENCES ATTENDED**

<b>S. No.</b>	<b>Name</b>	<b>Role</b>	<b>Signature of supervising Faculty</b>

**PUBLICATIONS**

<b>S. No.</b>	<b>Topic</b>	<b>Journal</b>	<b>Role</b>

**BEDSIDE CASE DISCUSSION (optional)**

<b>S. No.</b>	<b>Date</b>	<b>Diagnosis</b>	<b>Signature of Faculty Presented to</b>



SUMMARY OF LOG BOOK

(To be filled at the end of the course & retained in this book)

Name of the student : Admn.No.

Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_

Name of the Institute:

- 1) No. of Journal Review Presentations : Presented ..... Attended .....
- 2) No. of Seminar Presentations : Presented ..... Attended .....
- 3) No. of Clinical Presentations : Presented ..... Attended .....
- 4) No. of Case Presentations : Presented ..... Attended .....
- 5) No. of UG Teaching Programms : Conducted ..... Attended .....  
(Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
- 6) No. of PG Teaching Programmes : Attended
- 7) No. of Investigative Procedures : Performed .....Assisted.....Observed...
- 8) No. of Major Operations / : Performed .....Assisted.....Observed...  
Procedures /  
Experiments
- 9) No. of Minor Operations / : Performed .....Assisted.....Observed...  
Procedures /  
Experiments
- 10) No. of Emergencies : Performed .....Assisted.....Observed...
- 11) No. of Medicolegal work : Performed .....Assisted.....Observed...
- 12) No. of Public Health Visit /  
Social work /  
Survey /  
Immunization /  
Camps
- 13) No. of Clinico Pathological Conference: Presented ..... Attended .....
- 14) No.of special investigation / : Conducted ..... Attended .....  
Procedure
- 15) No. of events attended Conferences..... Symposia .....  
Workshops ..... CME .....
- 16) Any other activities :

Signature of the candidate      Signature of the guide      Signature of the HoD with seal

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUPATI**

(A University established by an Act of A.P. State Legislature)

**GUIDELINES FOR 'PLAGIARISM' CHECK**

**WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D students**

**Ref.:Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/MS/DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for Theses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They are requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

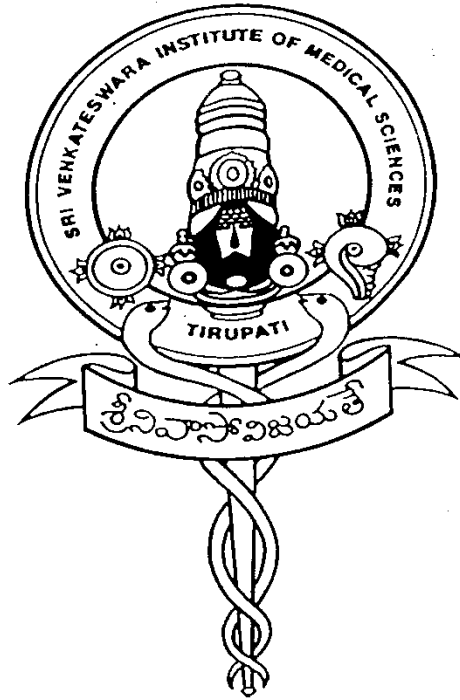
**Sd/- CONTROLLER OF EXAMINATIONS**

To: The HOD/Chief Guide Concerned for information and circulation among the respective students.

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI - 517 507**



**M.D. - BIOCHEMISTRY**

**COMMON BOARD OF STUDIES MEETING**

**ON 22.07.2021**

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**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUAPATI**

**M.D. (BIOCHEMISTRY)**

**COMMON BOARD OF STUDIES MEETING ON 22.07.2021**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**  
**M.D (BIOCHEMISTRY)**

**COMMON BOARD OF STUDIES MEETING ON 22.07.2021**

**List of Members:**

1. Dr B. Siddhartha Kumar - Chairman  
Dean, SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar, SVIMS,  
Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr Aparna R Bitla - Internal expert  
Professor & Head  
Dept. of Biochemistry  
SVIMS, Tirupati.
5. Dr M.M. Suchitra - Internal expert  
Professor  
Department of Biochemistry  
SVIMS, Tirupati
6. Dr M. Vijaya Bhaskar - External expert  
Professor  
Nizam's Institute of Medical Sciences,  
Hyderabad, Telangana

# **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING FOR MD IN BIOCHEMISTRY**

## **I. PREAMBLE**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The student who has obtained MD degree in Biochemistry should be well-versed in basic concepts and recent advances in the subject and should have acquired skills and expertise in various laboratory techniques applicable to metabolic and molecular aspects of medicine and in research methodology. Training during the course should equip the student with skills to become an effective teacher, able to plan and implement teaching programmes for students in medical and allied health science courses, set up/manage a diagnostic laboratory, generate, evaluate and interpret diagnostic laboratory data, interact with clinicians to contribute to more effective patient care and carry out a research project and publish its results.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment.

## **II. SPECIFIC LEARNING OBJECTIVES**

At the end of the MD training programme in Biochemistry, the post graduate student should have acquired competencies in the following areas, as detailed below.

### **1. Acquisition of knowledge**

The student should be able to explain clearly concepts and principles of biochemistry and cell biology, including correlations of these with cellular and molecular processes involved in health and disease.

### **2. Teaching and training**

The student should be able to effectively teach undergraduate students in medicine and allied health science courses so they become competent health care professionals and able to contribute to training of post graduate students.

### **3. Diagnostic services**

The student should be able to set up/supervise/manage a diagnostic

laboratory in Biochemistry in a hospital, ensuring quality control, and providing a reliable support service. The student should be able to provide clinicians with consultation services for diagnostic tests in biochemistry and in interpretation of laboratory results.

#### **4. Research**

The student should be able to carry out a research project from planning to publication and be able to pursue academic interests and continue life-long learning to become more experienced in all the above areas and to eventually be able to guide postgraduates in their thesis work.

Regulations governing the Doctor of Medicine (Biochemistry) programme

##### **1. Title of the programme**

The programme shall be called : Doctor of Medicine (Biochemistry)

##### **2. Eligibility for admission**

A candidate seeking admission into this course shall have MCI recognized M.B.B.S. qualification.

##### **3. Duration of the programme**

The programme shall extend for a period of three academic years.

##### **4. Syllabus**

The Board of studies shall prepare and approve syllabus. Also it shall review the same periodically.

##### **5. Admission**

Based on an entrance examination to be conducted at the national level – NEET-PG. All the students should get their MBBS degree registered with AP state medical council before completion of first semester.

##### **6. Attendance – Eligibility for appearing for final university exams.**

All the 365 days of the year are working days for Residents. The Resident should have a minimum percentage of attendance i.e. 80% in every academic term of 6 months duration each for the candidate to be eligible for the University examinations.

### III. SUBJECT SPECIFIC COMPETENCIES

The student during the training programme should acquire the following competencies:

#### A. Cognitive domain

1. Describe and apply biochemical principles to explain the normal state, abnormal disease conditions and mechanism of action used in the perception, diagnosis and treatment of diseases. Explain energy transactions in a living system, and describe importance of bio molecules in sustaining the life process.
2. Describe pathways of the intermediary metabolism along with their individual and integrated regulation and apply that in understanding the functioning of the body.
3. Describe and apply the concept of nutrition in health and disease, micro- and macro- nutrition and essential nutrients, and interlinks of nutrients with metabolism and functions of a living system.
4. Apply and integrate knowledge of molecular and metabolic conditions in normal and disease states for clinical problem solving and research.
5. Acquire knowledge on application of various aspects of genetic engineering in medicine.
6. Acquire knowledge and apply the principle of statistics, biostatistics and epidemiology to the evaluation and interpretation of molecular and metabolic disease states.
7. Evaluate, analyze and monitor disease states by applying relevant biochemical investigations and interpreting the clinical and laboratory data.
8. Able to integrate principles of immunology in biochemistry.
9. Demonstrate knowledge of basics of research methodology, develop a research protocol, analyse data using currently available statistical software, interpret results and disseminate these results and to have the potential ability to pursue further specializations and eventually be competent to guide students.
10. Describe the principles of teaching - learning technology towards application and take interactive classroom lectures, prepare modules for PBL, organize and conduct PBLs, case discussions, small group discussions, Seminars, Journal club and research presentations.
11. Demonstrate knowledge of principles of Instrumentation.
12. Demonstrate knowledge about recent advances and trends in research in the field of clinical biochemistry.



## **B. Affective domain**

1. Effectively explain to patients from a variety of backgrounds, the molecular and metabolic basis of disease states and lifestyle modifications.
2. Communicate biochemical reasoning effectively with peers, staff and faculty, and other members of the health care team.
3. Demonstrate empathy and respect towards patients regardless of the biochemical nature of their disease.
4. Demonstrate respect in interactions with patients, families, peers, and other health care professionals.
5. Demonstrate ethical behavior and integrity in one's work.
6. Demonstrate effective use of nutrition, lifestyle and genetic counseling.
7. Be aware of the cost of diagnostic tests and economic status of patients.
8. Acquire skills for self-directed learning to keep up with developments in the field and to continuously build to improve on skills and expertise.

## **C. Psychomotor domain**

1. Able to select, justify, and interpret the results of clinical tests in biochemistry.
2. Develop differential diagnoses for molecular and metabolic causes of diseases.
3. Suggest preventive, curative, and/or palliative strategies for the management of disease.
4. Predict effectiveness and adverse effects associated with disease intervention.
5. Demonstrate skills for clinical diagnosis, testing, understanding of biochemical conditions and diagnostic service.
6. Perform important biochemical, immunological and molecular biology techniques.
7. Observed working of important advanced techniques.
8. Demonstrate standard operating procedures of various methods and techniques used in clinical biochemistry.
9. Determination of enzyme activity and study of enzyme kinetics. Ideally it should be accompanied by purification (partial) of the enzyme from a crude homogenate to emphasize the concepts of specific activity, yield and fold purification.
10. Demonstrate and report routine investigations in hematology and microbiology.
11. Demonstrate presentation skills at academic meetings and publications.

## **IV. SYLLABUS**

### **THEORY**

## **PAPER I**

**Physical and organic aspects of biochemistry, General laboratory procedures, Biomolecules, cell biology, biochemical techniques, biostatistics and research methodology, basics of medical education in teaching and assessment of biochemistry.**

### **PHYSICAL AND ORGANIC ASPECTS OF BIOCHEMISTRY**

pH and buffers, gas laws and partial pressures colloids and emulsions, surface tension, viscosity, diffusion, osmosis, solutions, reactions of aldehydes, ketones, alcohols and organic acids, Vanderwaals forces, hydrogen bonding, hydrophobic interactions and ionic bridges, determination of molecular weights.

### **GENERAL LABORATORY PROCEDURES**

Water, reference materials, glass ware and plastic ware, volumetric equipment centrifuges, solutions, mixers and homogenizers, filtration and concentration, balances, units, buffers, safety.

### **BIOMOLECULES**

Properties of water

Concept of an acid, a base, pH, pK, buffer and buffering capacity Classification, structure and functions of amino acids and peptides Structural organization of proteins and relationship with their functions:

- Primary, secondary, tertiary and quaternary structure of proteins
- Protein folding and denaturation, structure-function relationship of proteins
- Structure and functions of hemoglobin and myoglobin
- Structure and function of collagen
- Structure and function of immunoglobulins, classification, functions, properties and reactions of carbohydrates classification, properties and importance of lipids
- Fatty acids - nomenclature, classification, properties, reactions
- Mono, di and triacylglycerols
- Transfats
- Cholesterol - structure, properties and functions
- Phospholipids - definition, types, properties and importance
- Glycolipids - definition, types, functions, examples.
- Lipoproteins - definition, structure, types, functions, role of apoproteins, importance in health and disease.
- Biological membranes - structure, function, properties and importance.
- Micelles and liposomes nucleotides and nucleicacids
- Purine and pyrimidine bases in DNA and RNA

- Nucleosides and nucleotides
- Physiologically important nucleotides
- Synthetic analogues of purine/ pyrimidine bases and nucleosides used as therapeutic agents (anti-cancer drugs, anti-viral drugs)
- Watson and crick model of DNA structure
- Structure and functions of different types of RNA.

## **CELL BIOLOGY**

- Structure of the cell, different sub cellular organelles and cell fractionation
- Structure and functions of cell membrane, solute transport across biological membranes
- Intracellular traffic and sorting of proteins
- Intracellular signaling pathways, membrane receptors and second messengers  
Extracellular matrix: composition, importance and biomedical importance, cellular adhesion molecules and intercellular communication
- Cytoskeleton, muscle contraction and cell motility
- Red and white blood cells

## **ANALYTICAL TECHNIQUES IN BIOCHEMISTRY**

Principles clinical applications and related aspects of:

- Spectro photometry (UV and visible spectro photometry),
- Atomic absorption spectro photometry
- Flame photometry
- Fluoro metry
- Turbidimetry and nephelometry
- Gravimetry
- Osmometry
- Electrochemistry (pH electrodes, ion-selective electrodes, gas-sensing electrodes)
- Chemiluminescence
- Water testing
- Electrophoresis (principle, types, applications; isoelectric focusing capillary electrophoresis; 2-Delectrophoresis, clinical applications and related aspects)
- Chromatography (principle, types [including high performance liquid chromatography and gaschromatography] clinical applications and related aspects)
- Immunoassays (principle, methods, types, clinical applications and related aspects)
- Techniques in molecular biology: Blotting techniques, polymerase chain reaction

(PCR), DNA and protein sequencing, microarrays and DNA chip technology, cloning techniques, genomics, proteomics and metabolomics

### **Nanotechnology and micro-fabrication**

**Techniques to study in vivo metabolism - NMR, SPECT, PET scans**

**Radioisotope-based techniques and its applications**

## **BIostatISTICS AND RESEARCH METHODOLOGY**

- Basic concepts of biostatistics as applied to health science
- Measures of central tendencies and variation
- Statistical tests: parametric and non-parametric comparisons, t-test, paired t-test, analysis of variance, chi-square test, Fischer's exact test, non-parametric tests, correlation and regression (linear and non-linear regression)
- Multivariate analysis methods, one way and two way analysis of variance, multiple range tests
- Statistical methods of validation of diagnostic tests - commonly used statistical software
- Calculation of sample size
- Basics of epidemiological study designs and sampling methodologies
- Meta-analysis and systematic reviews

## **V. BASICS OF MEDICAL EDUCATION IN TEACHING AND ASSESSMENT OF BIOCHEMISTRY**

Principles of adult learning, taxonomy of learning, educational objectives, principles of assessment and question paper setting, methods of assessing knowledge, appropriate use of media, microteaching, small group teaching.

### **Paper II**

**Enzymes, bioenergetics, biological oxidation, intermediary metabolism and regulation, inborn errors of metabolism and nutrition**

#### **Enzymes:**

Properties, classification, mechanism of action, coenzymes and cofactors, kinetics of enzyme activity, regulation of enzyme activity, enzyme inhibition, isoenzymes, diagnostic and therapeutic enzymes, principles of assays of enzymes, enzymes as

therapeutic targets of drugs.

### **Biological oxidation:**

Basic concepts of thermodynamics and its laws, as applied to living systems, Exergonic and endergonic reactions and coupled reactions, redox potential, High energy compounds

Classification and role of oxidoreductases, Cytochromes; cytochrome P450 system

### **Respiratory chain and oxidative phosphorylation**

- Components, complexes and functioning of the respiratory chain
- Process of oxidative phosphorylation
- Mechanisms of ATP synthesis and regulation
- Mitochondrial transport systems and shuttles
- Inhibitors, uncouplers and ionophores
- OXPHOS diseases

## **OVERVIEW OF METABOLISM AND INTERMEDIARY METABOLISM**

### **Metabolism of carbohydrates**

- Digestion and absorption
  - Glycolysis and tricarboxylic acid cycle (TCA), including regulation
  - Glycogen metabolism and its regulation
  - Cori cycle, gluconeogenesis and control of blood glucose
  - Metabolism of fructose and galactose
  - Pentose phosphate (HMP shunt) and uronic acid pathways and their significance
  - Polyol pathway
  - Regulation of blood glucose levels
  - Diabetes mellitus (including gestational diabetes mellitus) – classification, pathogenesis, metabolic abnormalities, diagnostic criteria, principles of treatment, pathogenesis of complications, laboratory tests
- 
- Metabolism of ethanol
  - Inborn errors of metabolism

### **Metabolism of lipids**

- Ketone bodies – formation, utilization and regulation
- Metabolism of unsaturated fatty acids and eicosanoids
- Metabolism of triacylglycerol; storage and mobilization of fats
- Metabolism of cholesterol
- Metabolism of lipoproteins
- Metabolism in adipose tissue
- Role of liver in lipid metabolism, fatty liver, lipotropic factors
- Role of lipids in atherogenesis
- Metabolism of phospholipids and associated disorders
- Inborn errors of metabolism

### **Metabolism of amino acids and proteins**

- Digestion and absorption
- Pathways of amino acid degradation - transamination, deamination
- Transport and metabolism of ammonia
- Metabolism of individual amino acids.
- Plasma proteins
- Inborn errors of metabolism

### **Metabolic inter-relationships**

- Fate of pyruvate, fate of acetyl co A
- One carbon metabolism

### **Metabolism of nucleotides**

- De novo synthesis of purine nucleotides
- Salvage pathway for purines
- Degradation of purines
- De novo synthesis of pyrimidin nucleotides
- Degradation of pyrimidine
- Synthetic analogues of purine/pyrimidine bases and nucleosides used as therapeutic agents
- Inborn errors of metabolism

### **Metabolism of heme**

- Biosynthesis of heme and associated disorders
- Degradation of heme and associated disorders

### **Metabolism in individual tissues and in the fed and fasting states**

- Liver, adipose tissue, brain, RBCs

### **Nutrition**

- Principal food components
- General nutritional requirements
- Basal metabolic rate, Energy requirements
- Biological value of proteins
- Thermogenic effect of food - specific dynamic action
- Balanced diet, diet formulations in health and disease, mixed diet
- Nutritional supplements
- Food toxins and additives
- Parenteral nutrition
- Disorders of nutrition, obesity, protein and protein energy malnutrition, dietary fibers, under-nutrition, laboratory diagnosis of nutritional disorders
- National Nutrition Programme

### **Vitamins**

Classification, biochemical role, sources, RDA and deficiency state of each vitamin (including diagnostic tests for deficiency and treatment), hypervitaminosis

### **Minerals**

Classification, biochemical role, sources, requirement and deficiency state of each mineral (including diagnostic tests for deficiency and treatment)

### **Metabolism of xenobiotics**

Free radicals and anti-oxidant defence systems in the body and associations with disease processes

### **Paper III**

## **Molecular biology, molecular and genetic aspects of cancer, immunology and effects of environmental pollutants on the body**

### ***Structure and organization of chromosomes and chromatin re-modelling DNA replication***

- DNA replication in prokaryotes and eukaryotes (including important differences between the two):
- Roles of DNA polymerase, helicase, primase, topoisomerase and DNA ligase
- Replication fork
- Okazaki fragments and its importance in replication.
- Overview of role of major DNA repair mechanisms – mismatch repair, base excision repair, nucleotide excision repair and double strand break repair.
- Diseases associated with abnormalities of DNA repair systems
- DNA recombination

### **Transcription**

- Structure of a gene - exons and introns, promoter, enhancers/ repressors and response elements.
- Process of transcription in prokaryotes and eukaryotes – initiation, elongation and termination (including important differences).
- Post-transcriptional processing – capping, tailing and splicing.

### **Genetic code and mutations**

- Characteristics of the genetic code
- Molecular basis of degeneracy of the genetic code (Wobble hypothesis)
- Mutagens- examples of physical, chemical and biological mutagens.
- Types of mutations – point mutations and chromosomal mutations
- Relationship of mutations with specific diseases

### **Translation**

- Basic structure of prokaryotic and eukaryotic ribosomes.
- Structure of tRNA (diagram of clover leaf model of tRNA structure) and its function in protein synthesis.
- Function of aminoacyl tRNA synthase.
- Process of protein synthesis (translation) – initiation, elongation and termination (including important differences between prokaryotic and



eukaryotic translation).

- Inhibition of prokaryotic translation by antibiotics.
- Post-translational modifications

### **Regulation of gene expression in prokaryotes and eukaryotes**

- The operon concept in prokaryotes
- Role of general and gene specific transcription factors
- Small interference RNA (siRNA) and micro RNA (miRNA).
- Other modes of regulation of gene expression: alternative splicing, alternative promoter usage, DNA methylation, Histone acetylation / deacetylation, RNA editing, alterations of RNA stability

### **Recombinant DNA technology and its applications in modern medicine**

- Concepts of recombinant DNA, genetic engineering, biotechnology and cloning.
- Restriction endo nucleases.
- Vectors for cloning – plasmids and phages.
- Genomic and cDNA libraries.
- Applications of recombinant DNA technology in medicine.
- Gene therapy
- Diagnosis of genetic diseases and genetic counseling
- DNA fingerprinting
- DNA sequencing
- Microarrays
- Fluorescent in situ hybridization (FISH)
- DNA vaccines
- Transgenic animals
- Application of molecular techniques in forensic investigation and medico-legal cases

### **Overview of Human Genome Project**

## **Basics of bioinformatics**

### **Principles of human genetics**

- Alleles, genotypes and phenotypes
- Patterns of inheritance: monogenic and polygenic inheritance
- Population genetics
- Genetic factors in causation of diseases
- Types of genetic diseases: Chromosomal, monogenic and polygenic disorders, mitochondrial disorders, nucleotide repeat expansion disorders, imprinting disorders
- Screening for genetic diseases and prenatal testing
- Ethical and legal issues related to medical genetics

### **Stem cells in clinical medicine**

- Basic concepts regarding stem cells
- Types of stem cells: embryonic and induced pluripotent stem cells (iPSC)
- Potential applications in the clinical medicine
- Ethical and legal issues related to use of stem cells in medicine

### **Cancer**

- Cell cycle and its regulation, mitosis, meiosis
- Mechanisms of cell death, Apoptosis
- Carcinogens: physical, chemical and biological
- Clonal origin of cancers
- Genetic basis of carcinogenesis
- Role of oncogenes and tumour suppressor genes
- Familial cancer syndromes
- Cancer stem cells
  
- Epigenetic regulation in cancer
- Gene expression profiling in cancer
- Cancer cell biology: cell cycle abnormalities, telomerase activity, proliferative capacity and decreased apoptosis
- Metastasis
- Tumor markers
- Biochemical basis of cancer chemotherapy and drug resistance
- New methods of anti-cancer therapy: targeted cancer therapy, cancer immunotherapy.

## **Immunology**

- Innate and acquired immunity
- Humoral and cell-mediated immunity
- Cells and organs of the immune system - T and B cells, macrophages, dendritic cells, NK cells, granulocytes
- Antigens, epitopes and haptens
- Immunoglobulin classes, isotypes, allotypes, idiotypes, monoclonal antibodies, organization and expression of immunoglobulin genes, immunoglobulin gene rearrangement, class switching
- Antigen-antibody interaction - immunochemical techniques
- Major histocompatibility complex, antigen processing and presentation,
- T cell and B cell receptor, toll like receptors
- T cell maturation/activation/differentiation
- B cell generation/activation/differentiation
- Cytokines
- Complement system, cell
- Immune response to infections
- Hypersensitivity reactions
- Immunologic tolerance, Immunosuppression and immunopotential
- Vaccines
- Immuno-deficiency syndromes
- Autoimmunity
- Transplantation immunology
- Cancer and immune system,
- Immunodiagnostics
- Immunotherapy

*Environmental Biochemistry: Toxic elements and effects of environmental pollutants on the body, health and population*

## Paper IV

**Basic principles and practice of clinical biochemistry, Laboratory management along with Total quality management and analytical techniques, Clinical correlates and analytical procedures including molecular diagnostics related to different body systems/organs, endocrinology, and recent advances in biochemistry**

### Paper IV

**Clinical biochemistry and molecular diagnostics related to different body systems/organs, endocrinology, and recent advances in biochemistry**

#### *Basic principles and practice of clinical biochemistry*

- Units of measurement, conventional and SI units, interconversion of units, reference material, testing of water purity, calibration of commonly used laboratory equipment, reagents, clinical laboratory supplies, basic separation techniques, laboratory calculations, specimen collection and processing (Collection of blood, urine and body fluids, handling of specimens, storage and preservatives, anticoagulants), Preanalytical variations (Biological variation, specimen collection related variation, post collection variations) safety in the laboratory, clinical utility of laboratory tests (including sensitivity, specificity, ROC curves, etc), analysis in the laboratory, evidence-based laboratory medicine, establishment and use of reference values, critical alerts. Biomedical waste management, Basics of laboratory accreditation

#### **Laboratory management**

- Method evaluation: analytical goals, precision, accuracy, bias, sensitivity and specificity, selection of method and evaluation
- Total quality management: Fundamental concepts, control of preanalytical, analytical and postanalytical variables, internal and external quality control programs, ; aboraotryinformation system
- Automation: Definition, instrumental concepts, analysers, selection of analysers, trends in automation

#### **Analytical techniques and instrumentation**

- Principles of basic techniques used in a clinical biochemistry laboratory (spectrophotometry, electrochemistry, electrophoresis, osmometry, chromatography, mass spectrometry, immunochemical techniques, molecular techniques, automation, point of care testing.

#### **Clinical correlates and analytical procedures**

- Amino acids, peptides and proteins; non-protein nitrogenous compounds
- Enzymes
- Carbohydrates
- Lipids, lipoproteins and apolipoproteins and other cardiovascular risk factors
- Electrolytes
- Blood gases and pH
- Hormones and associated disorders
- Catecholamines and serotonin
- Vitamins; trace and toxic elements
- Hemoglobin, and bilirubin
- Porphyrins and associated disorders
- Bone and mineral metabolism
- Tumour markers
- Assessment of organ functions (hypothalamus and pituitary, adrenal glands, gonads, thyroid, parathyroid, liver, kidney, heart, stomach, pancreas, intestine, etc) and associated disorders
- Pregnancy and maternal and fetal health
- Reproduction related disorders -infertility
- Newborn screening
- Inborn errors of metabolism
- Hemostasis
- Therapeutic drug monitoring
- Clinical toxicology
- Molecular diagnostics
- Body fluid analyses

**Regulation of fluid and electrolyte balance and associated disorders**

**Regulation of acid-base balance and associated disorders**

## **Biochemistry of the endocrine system**

- Cell signalling: Introduction of concept of Autocrine, paracrine, juxtacrine, endocrine systems
- Classification and general mechanism of action of hormones
- Chemistry, Biosynthesis, secretion, regulation, transport and mode of action of hypothalamic peptides, adenohipophyseal and neurohipophyseal hormones, thyroid and parathyroid hormones, calcitonin, pancreatic hormones, adrenocortical and medullary hormones, gonadal hormones, gastrointestinal hormones, opioid peptides, parahormones.
- Biochemistry of conception, reproduction and contraception
- Endocrine interrelationship and their involvement in metabolic regulation
- Neuro-modulators and their mechanism of action and physiological significance
- Biochemical aspects of diagnosis and treatment of endocrinal disorders.
- Autoimmune polyglandular syndromes
- Other biomolecules: Autocrine, paracrine molecules like nitric oxide, endothelins.

## **Hematopoietic disorders**

- Iron deficiency and other hypoproliferative anaemias- iron metabolism, laboratory tests of iron status, iron therapy
- Anaemia of chronic disease, anaemia of renal disease
- Hemoglobinopathies - sickle cell anaemia, methaemoglobinemias, thalassemia syndromes, Megaloblastic anaemia
- RBC membrane and metabolism
- Hemolytic anaemia - inherited defects in RBC membrane and enzymes (G6PD deficiency), immunologic causes of hemolysis
- ABO blood group system - biochemical basis, transfusion biology.
- Plasma cell disorders - multiple myeloma.

## **Hemostasis and thrombosis**

- Biochemical mechanisms, related laboratory tests, antiplatelet/ anticoagulant/fibrinolytic therapy

## **Biochemistry of AIDS**

### **Nervous system**

- CSF and its composition
- Neurotransmitters and their receptors
- Ion channels and channelopathies
- Neuro trophic factors
- Protein aggregation and neuro degeneration
- Alzheimer's disease, Parkinson's disease, Huntington's disease, multiple sclerosis
- Prions and prion diseases
- Guillain-Barre syndrome -immune pathogenesis
- Myasthenia gravis -patho physiology
- Hereditary myopathies - Duchenne muscular dystrophy
- Inherited disorders of muscle energy metabolism
- Mitochondria myopathies
- Pathophysiology of psychiatric disorders such as anxiety, depression and schizophrenia

### **Cardiovascular system**

- Atherosclerosis - pathogenesis, risk factors, prevention and treatment Cardiac failure, acute coronary syndrome, cardiac biomarkers

### **Respiratory system**

- Gaseous exchange in lungs - physiological features and disturbances, arterial blood gases, Pathogenesis of cystic emphysema, alpha-1 anti-trypsin deficiency

### **Gastrointestinal system**

- Gastric physiology
- Pathophysiology of peptic ulcer disease, including role of *H. pylori*; gastric function tests; Zollinger-Ellison syndrome
- Digestion and absorption of nutrients and the associated disorders; evaluation of malabsorption (steatorrhea, lactose intolerance)
- Celiac disease
- Inflammatory bowel disease

- Protein losing enteropathy
- Regulatory peptides in the gut
- Neuro endocrine tumours

### **Kidney**

Kidney function tests; pathophysiology, biochemistry, laboratory findings and management in acute kidney injury and chronic kidney disease; estimation of GFR; glomerular diseases - pathogenesis and mechanisms of glomerular injury, nephritic syndrome, diabetic nephropathy; tubular disorders - renal tubular acidosis, proteinuria, nephrolithiasis, kidney transplant; biochemical aspects of renalstones.

### **Liver**

- Liver function tests
- Hyper bilirubinemias
- Viral hepatitis
- Serologic/virologic markers
- Alcoholic liver disease, fatty liver, chronic liver disease, cirrhosis and its complications
- Pathogenesis of ascites
- Hepatic encephalopathy
- Metabolic diseases affecting liver
- Reye's syndrome
- Diseases of gall bladder/bile ducts - pathogenesis of gall stones
- Pancreas - acute and chronic pancreatitis, cystic fibrosis, pancreatic function tests.

### **Bone and mineral metabolism**

- Bone structure and metabolism; metabolism of calcium, phosphate and magnesium; regulation and abnormalities of bone metabolism; vitamin D; parathyroid hormone; calcitonin; parathyroid hormone-related (PTHrP); osteoporosis - pathophysiology; markers of bone turnover



## PRACTICAL

**By the end of the course, the post graduate student should have acquired practical skills in the following:**

- Use of common laboratory equipments like centrifuge, balance, colorimeter, pH meter
- Preparation of reagents
- Performance of reactions of carbohydrates, amino acids and proteins, and lipids
- Experiments to demonstrate constituents of milk
- Experiments to demonstrate normal and abnormal constituent so furine
- Determination of iodine number and saponification number of fats
- Estimation of ammonia and amino acids by Sorenson formal titration
- Estimation of nitrogen estimation in a given amino acid solution by micro Kjeldahl method
- Estimation of phosphorus by Fiske Subbarao method
- Estimation of ascorbic acid in lime
- Estimation of calcium content in milk
- Estimation of proteins by Folin's method and dye binding method.
- Two-dimensional paper chromatography for separation of amino acids
- Preparation and estimation of starch, glycogen, cholesterol, casein (phosphorus in casein) and hemoglobin from biological samples  
Determination of enzyme activity and study of enzyme kinetics, using any 2 suitable enzymes (eg, catalase from rat liver and acid phosphatase from potatoes).
- Estimation of clinical analytes as detailed below:
  - Blood glucose, glycated haemoglobin; performance of glucose tolerance test
  - Electrolytes, arterial blood gas analysis
  - Cholesterol, triglycerides, free fatty acids, phospholipids, Lp (a), urea, creatinine, uric acid, ammonia, micro albuminuria
  - Parameters of liver function tests (bilirubin, hepato-biliary enzymes such as AST, ALT, ALP, GGT, serum proteins/albumin and prothrombin time)
  - Calcium, magnesium, copper (and ceruloplasmin), serum iron, TIBC and ferritin
  - Markers of myocardial damage (CK, CK MB, troponins, LDH)
  - Other enzymes of diagnostic relevance (eg. phosphatases, amylase etc)
  - Vitamins D and B12 and folate

- Routine urine analysis, creatinine clearance, eGFR calculation, analysis of renal calculi, other screening tests
- Electrophoresis of serum proteins
- Electrophoresis of lipoprotein (*Optional*)
- Electrophoretic separation of LDH isozymes or any other isoenzymes
- Clearance tests
- CSF analysis
- Tumor marker analysis, Thyroid function tests and other hormone assays by ELISA/RIA/Chemiluminescence Analysis of electrolytes, blood gases
- Preparation of buffers.

### **Clinical Laboratory**

- Laboratory work up of patients/subjects: for routine clinical chemistry investigations, specific assays, screening tests
- Taking any one parameter, students should prepare a Levy Jennings chart and plot inter-assay and intra-assay variation for the laboratory.
- Implementation of West gard rules.
- Computers and statistical analysis: Calculation of mean, median, mode, standard deviation, correlation, linear and nonlinear regression, tests of significance, nonparametric tests, Basics of computers, use of micro soft excel spreadsheets solutions, SPSS, EPI-Info, Information retrieval, use of internet

### **Optional:**

- Determination of reference values for any one parameter for the clinical laboratory
- In addition, all efforts should be made to ensure that students at least see a demonstration of the following techniques.
- Separation of peripheral blood lymphocytes using ficollhpaque
- Sub cellular fractionation/marker enzymes for organelles to demonstrate fractionation
- Ultracentrifugation
- Isolation of high molecular weight DNA from tissues/blood
- Isolation of RNA; synthesis of cDNA by reverse transcription; PCR (both conventional and real-time)
- Isolation of plasmids and agarose gel electrophoresis for proteins and

- nucleic acids
- Basic techniques in cell culture
- High performance liquid chromatography(HPLC)

### Practical and skills training

	MONTHS	LAB	Objective	Teaching/Learning method	Assessment
	<b>1<sup>st</sup>YEAR</b>				
1	MAY	CLINICAL LAB	Understand workflow in clinical laboratory	Practical training during posting	Theory examination Group discussion Viva-voce Spotters Case discussion
			Know the reference ranges of analytes including sensitivity and linearity of methods used	Resource material	
2	JUNE	CLINICAL LAB	Types of sample, sample collection precautions and anticoagulants and preservatives used in sample collection	Assignment	
			Should know about pre-analytical, analytical and post analytical variables	Resource material	
			Should validate and report results under supervision	Practical training during posting Simulation exercises	
			Know the types of water used in the clinical laboratory	Resource material	
			Cleaning and maintenance of glassware and plastic ware used in the laboratory	Relevant case discussions, Resource material	
			Use of computers and LIS	Resource material Assignment Simulation exercises	

3	JULY	Research LAB	Learn basics of Research methodology and Biostatistics Should be able to perform using Microsoft excel spreadsheets data entry and graphical presentation of data Commonly used Biostatistical tools for comparison of means, correlation and prediction Journal club presentation Learn writing research protocols	Resource material Discussions Simulation exercises	Theory examination OSPE
4	AUGUST	UG LAB	Must be able to perform the undergraduate experiments both qualitative and quantitative Participate in MBBS Practical classes	Hands on training Resource material	Practical examination - Same pattern as MBBS (Qualitative)
5	SEPTEMBER	UG LAB	Must be able to prepare reagents and solutions commonly used in the UG practicals Participate in MBBS Practical classes		
6	OCTOBER	UG LAB	Should learn to handle equipment - colorimeter, centrifuge, physical balance, pH meter Participate in MBBS Practical classes	Resource material	Theory examination
7	NOVEMBER	UG LAB	Gain knowledge regarding types of glassware, plastic ware, pipettes and types of water -distilled water preparation Should know about the safe practices in the laboratory and types of accidents which can occur and first aid in case of chemical burns Participate in MBBS Practical classes Train paramedical students	Resource material	
8	DECEMBER	UG LAB			

9	JANUARY	CLINICAL LAB	Learn details of patient preparation, instructions to patient	Seminars Case discussions	OSPE Spotters
10	FEBRUARY	CLINICAL LAB	Learn about interpretation of the pre-analytical, analytical and post-analytical variables,		
11	MARCH	CLINICAL LAB	anti-coagulants,preservatives and interferences in the lab reports		
12	APRIL	CLINICAL LAB	Validate the reports under guidance To be trained in handling, maintenance and operating of auto analyser QC Measures-internal QC- Interpreting control charts advanced clinical laboratory investigations		
<b>II<sup>nd</sup>YEAR</b>					
13	MAY	PG LAB	Gain knowledge regarding types of glassware, plastic ware, pipettes, PG lab equipment and types of water -distilled water preparation Preparation of normal and molar solutions and Buffers Calculations and conversions Must prepare reagents for the experiments to be performed	Resource material Practical	Practical examination (End point assays Kinetic assays Techniques Method evaluation experiments)  OSPE
14	JUNE	PG LAB	Must be able to run standard curves and endpoint estimations and perform kinetic estimations and report the results, Perform precision check, recovery experiments and report the results, Should be able to carry out method evaluation experiments for kinetic and endpoint assays		
15	JULY	PG LAB	Must gain expertise in performing techniques electrophoresis, chromatography, flame photometry and PAGE.		



16	AUGUST	PG LAB	Calibration of pipettes and other instruments, Standardization of methods selected for thesis.	Resource material Practical	OSPE
17	SEPTEMBER	PG LAB	Handling of cooling centrifuge, Separation of cell components, Should be able to perform a PCR technique and DNA isolation Western blotting technique	Resource material	
18	OCTOBER	CLINICAL LAB	Perform advanced clinical laboratory investigations	Resource material Practical	Practical Examination OSPE
19	NOVEMBER	CLINICAL LAB	Validate the reports, Present QC results, Program methods in Analyzers		
20	DECEMBER	CLINICAL LAB			
21	JANUARY	CLINICAL LAB			
22	FEBRUARY	UG LAB	Student must get acquainted with teaching and conducting undergraduate practicals Maintenance of the equipment and glassware used in UG lab Should learn about corrosive chemicals used and precautions to be taken in handling such chemicals such as storage and discarding the reagents after use.	Resource material Hands on experience	Theory examination Practical examination (Qualitative and Quantitative) Viva-voce
23	MARCH	PERIPHERAL POSTINGS	Posted in allied branches as microbiology, pathology, transfusion medicine and Endocrinology	---	The postgraduate shall work in the allied departments in the morning session and report to the parent department for practical work (UG/PG) in
24	APRIL				

					the afternoon session
	<b>III<sup>rd</sup>YEAR</b>				
25	MAY-June15	RESEARCH LAB	Gain knowledge on Research methodology Journal club presentations, Should be able to perform statistical analysis using appropriate software Should be able to interpret an output and draw conclusions Journal club presentations	Seminars, Lectures	OSPE, Theory examination
26	JUNE16-30th	RURAL POSTINGS	District hospital		
27	JULY	RURAL POSTINGS	District hospital		
28	AUGUST-SEPTEMBER 15	RURAL POSTINGS	District hospital		
29	SEPTEMBER 16 <sup>th</sup> - 30th	CLINICAL LAB	Validate the reports independently, Programming of the analyser methods independently	Case discussions	OSPE Simulation exercises
30	OCTOBER	CLINICAL LAB	To train paramedical students, To manage the clinical lab independently on Sundays	Case discussions	
31	NOVEMBER	CLINICAL LAB	To train the 1st year MD student	Case discussions	
32	DECEMBER	UG LAB	Conducting undergraduate practical independently	-----	Observation
33	JANUARY	UG LAB			
34	FEBRUARY	UG LAB			
35	MARCH	RESEARCH LAB	Should know the working principles of specialized equipment available for research	Resource material Demonstration	Viva-voce
36	APRIL	RESEARCH LAB	Should be able to design a pilot study		



## **VI. TEACHING AND LEARNING METHODS**

### **Teaching methodology**

Active and interactive learning should be the mainstay of the program. The following methods are to be used to facilitate learning by and training of MD students.

#### **1. Interactive lectures, tutorials, problem-based learning, case discussions, seminars, guest lectures, E-learning**

The above teaching learning methods are employed for the post graduate students to acquire updated knowledge on various aspects of basic and clinical biochemistry, immunology and molecular biology, and their application in modern medicine and also to learn to communicate effectively.

#### **2. Journal club**

Journal club sessions are used by post graduate students to learn to search medical literature, to learn how scientific data is to be disseminated, to develop skills in presentation of research papers, to critically analyse and evaluate data, to become familiar with research methodologies, to keep oneself updated on new developments/emerging trends in biochemistry and to learn to communicate effectively

#### **3. Practical exercises**

These exercises are used by post graduate students to equip themselves with knowledge and hand-on skills in various techniques used for laboratory bench-work in biochemistry and molecular biology and in a diagnostic laboratory, and to learn to analyze and interpret data obtained.

#### **4. Thesis**

Under the supervision of a Professor or Associate Professor in the Department of Biochemistry, each PG student is expected to generate a hypothesis/research question and design a research protocol to test/answer it. The protocol should have clearly defined objectives and a work plan. The post graduate student will carry out the experimental research work proposed, analyze data, interpret results and write thesis/dissertation based on the work done and results obtained.

#### **5. Presentation of work done on thesis to peers**

A post graduate student of a postgraduate degree course in MD Biochemistry is required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his/her postgraduate studies so as to make him/her eligible to appear at the postgraduate degree examination.

#### **6. Teaching of undergraduates**

Postgraduate students in Biochemistry shall participate in teaching and training programmes of undergraduate students. They should learn how to organize, conduct and co-ordinate UG laboratory teaching in practical classes, to participate in clinical case-based teaching sessions and small group discussions (as part of a team that includes faculty members and senior residents of the department), to develop skills of self-directed learning, effective communication and leadership. They should learn how to work as part of a team and to facilitate learning by students.

#### **7. Horizontal and vertical integration of teaching of Biochemistry with other pre-clinical, para-clinical and clinical departments**

The post graduate students shall take part in integrated teaching of undergraduates by participation in joint teaching sessions and seminars with different departments, participation in clinical rounds for discussing cases of interest and by small group discussions of case-based problems.

#### **8. Training in the basics of medical education and technology**

The post graduate students shall be provided with training in the basics of medical education and technology through workshops at the departmental and/or institutional level.

#### **9. Development of communication skills**

The post graduate students shall develop effective communication skills by making presentations at seminars and journal club sessions and by teaching undergraduates.

#### **10. Training in clinical Biochemistry:**

The post graduate students shall receive hands-on training in a diagnostic laboratory in Biochemistry; such training shall be extensive and rigorous enough for each post graduate student to acquire adequate skills and expertise to manage and supervise such a laboratory. The post graduate students shall be posted in all sections of the laboratory in the institution, starting from sample collection and processing. They shall become proficient in working with the auto analysers in the laboratory, in quality control methods, setting up of a clinical biochemistry laboratory, specialized assays and statistical analysis of data. It acquire experience in running a 24-hours diagnostic laboratory; towards this end, it would help if they are posted in the laboratory out of regular hours as well.

#### **11. Rotation in clinical departments**

The post graduate students shall be posted in clinical departments after their training period in the diagnostic laboratory, for up to 2 months of the course. Suggested departments and durations of postings are as follows:

General medicine - 10days

Endocrinology - 10 days

Hematology - 10 days

Microbiology/Virology -1week

Pediatrics - 1 week

Nephrology- 1 week

These postings will help post graduate students get a better perspective on diagnostic tests in clinical practice and will enable them to contribute more effectively to patient care.

They shall also be posted in the district hospitals as suggested by the NMC ordinance for a period of up to 3 months.

Log Book:

All post graduate students shall maintain a log book that documents all the work that they have done during their years of training. This log book should be checked and assessed periodically by the faculty members involved in the training programme.

12. Department should encourage e-learning activities.

**During the training programme, patient safety is of paramount importance, therefore skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.**

**Suggested reading material:**

**Books (latest editions to be followed)**

1. Harpers Illustrated Biochemistry, Victor W. Rodwell , David Bender, Kathleen M. Botham, Peter J. Kennelly, P. Anthony Weil, McGraw-Hill Education/Medical.
2. Textbook of Biochemistry with Clinical Correlations, Thomas M. Devlin, John Wiley & Sons.
3. Biochemistry (Stryer), Jeremy M. Berg , John L. Tymoczko, Lubert Stryer, W. H. Freeman.
4. Lehninger Principles of Biochemistry, David L. Nelson, Michael M. Cox. W H Freeman & Co(Sd).
5. Biochemistry: A Case-oriented Approach, Rex Montgomery, Thomas W. Conway, Arthur A. Spector, David Chappell, Mosby
6. The Metabolic and Molecular Bases of Inherited Disease (four volumes). Charles Scriver
7. Biochemistry (Voet & Voet), Donald Voet, Judith G. Voet, John Wiley & Sons Inc.
8. Biochemistry (Lippincott's Illustrated Reviews), Denise R Ferrier , Lippincott Williams and Wilkins.
9. Practical clinical Biochemistry. H. Varley.
10. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, Carl A. Burtis, Edward R. Ashwood, Saunders.
11. Clinical Chemistry - Theory, Analysis, Correlation (Kaplan and Pesce), Mosby
12. Interpretation of Diagnostic tests, Jacques Wallach, Lippincott Williams & Wilkins.
13. Clinical Chemistry: Principles, Techniques, and Correlations, Michael L Bishop, Edward P Fody, Larry E Schoeff, Lippincott Williams and Wilkins.
14. Clinical Biochemistry: Metabolic and Clinical Aspects, William J. Marshall & Márta Lapsley & Andrew Day & Ruth Ayling, Imprint - Church and Livingstone.
15. Textbook of Biochemistry. West and Todd.

16. Kuby Immunology, Judy Owen, Jenni Punt , Sharon Stranford, W. H.Freeman.
17. Harrison's Principles of Internal Medicine, Dennis L. Kasper, AnthonyS.
18. Fauci, Stephen L. Hauser, Dan L. Longo, J. Larry Jameson, Joseph Loscalzo, McGraw- Hill Education / Medical.
19. Davidson's Principles and Practice of Medicine, Walker, Elsevier Health Sciences – UK.
20. Methods in Biostatistics. B.K.Mahajan.
21. Basic Biotechnology. R.Colin. Cambridge.

### **Journals**

03-05 international Journals and 02 national (all indexed) journals

#### **International Journals:**

1. Clinical Chemistry
2. Annals of Clinical Biochemistry
3. Clinical Biochemistry
4. Clinica Chimica Acta
5. Biochemia Medica
6. Journal of Clinical Investigation
7. Annual Review of Biochemistry
8. Clinical chemistry reviews
9. Journal of Clinical Endocrinology and Metabolism
10. Diabetes care
11. Free Radical Biology and Medicine
12. Annual review of Biochemistry

#### **Indian Journals**

1. Journal of Clinical and Scientific Research
2. Indian Journal of Clinical Biochemistry
3. Indian Journal of Medical Biochemistry
4. Indian Journal of Medical Research
5. Indian Journal of Endocrinology and Metabolism
6. Indian Journal of Nephrology

**VII. ANNEXURE 1**

**POSTGRADUATE STUDENTS APPRAISAL FORM**

Name of the Department :

Name of the PG Student :

Period of Training :FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis / Research work										
7.	Log Book Maintenance										

Publications Yes/No

Remarks\* \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For Score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE of ASSESSEE

SIGNATURE OF COURSE IN-CHARGE  
FACULTY

SIGNATURE OF HOD

## **VIII. ASSESSMENT**

### **FORMATIVEASSESSMENT, ie. during the training**

#### **General Principles**

Internal Assessment shall be frequent covering all domains of learning and used to provide feedback to improve learning; it shall also cover professionalism and communication skills. The Internal Assessment shall be conducted in theory and practical/clinical examination.

#### **Quarterly assessment during the MD training shall be based on:**

1. Journal based / recent advances learning
2. Patient based / Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

**SUMMATIVE ASSESSMENT** ie., assessment at the end of training . The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 as amended from time to time. The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

#### **Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.

2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfill attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination , by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three concerned examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

**Format of the Examination:**

1. Postgraduate examinations, consists of Thesis , Theory Papers, and Clinical/Practical and Oral examinations.



2. **Thesis:** Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.
- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.
- **The thesis topic shall be chosen before the end of eight months from the date of joining the course.** The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report (as per university regulations) six months before the Theory and Clinical / Practical examination.
- The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis

## **Theory:**

i) There shall be 4 theory papers each of three hours duration:

**Paper I: Biomolecules, cell biology, biochemical techniques, biostatistics and research methodology, basics of medical education in teaching and assessment of biochemistry**

**Paper II: Enzymes, bioenergetics, biological oxidation, metabolism of biomolecules, intermediary metabolism and regulation, inborn errors of metabolism and nutrition**

**Paper III: Molecular biology, molecular and genetic aspects of cancer, immunology and effects of environmental pollutants on the body**

**Paper IV: Basic principles and practice of clinical biochemistry, Laboratory management along with Total quality management and analytical techniques, Clinical correlates and analytical procedures including molecular diagnostics related to different body systems/organs, endocrinology, and recent advances in biochemistry**

ii) The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.

iii) Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.

The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.

iv) Moderation of Question Papers :

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers

1. One Senior Faculty member each from medical and surgical specialty, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

## 1. Practical and oral/viva voce examination:

This should be held over two days.

**Practical examination for the subjects in Basic Medical Sciences shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/Laboratory studies and his ability to perform such studies as are relevant to his subject.**

The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

### **Practical examination**

A. A clinical case for which an actual patient or a paper-based case may be used, as per the facilities available in each institution running the course. The clinical features of the patient and relevant laboratory investigation of biochemical abnormalities present will be discussed

#### **[Experiment 1**

50 Marks

Question involving estimation of at least two parameters using end point assay. One of them to be estimated along with calibration curve and within run precision.]

B. Performance of ELISA technique for assay of hormone/tumor marker and its interpretation.

#### **[Experiment 2**

40 Marks

Question involving assay of hormone/ tumor marker by ELISA.]

C. Question involving screening tests for inborn errors/body fluid analysis]

#### **[Experiment 3**

20 Marks

Question involving Screening tests for inborn errors/body fluid analysis]

D. Identification the carbohydrate/amino acid provided and confirm of its identity by paper chromatography, Urine analysis /Performance of an electrophoresis for serum proteins and discussion of electrophoretic pattern.

#### **[Experiment 4**

50 Marks

Question involving performance of Chromatography Or Electrophoresis.]

**E.** Quality Control data and its interpretation, Data analysis using Microsoft excel spread sheets, Clinical investigation graphs and their interpretation: to assess interpretative skills

**[Experiment 5**

**40 Marks**

Data presentation and analysis using excel spreadsheet solutions along with drawing of conclusions Clinical investigation reports in the form of lab reports, graphs, charts etc – for interpretation of results.]

Viva-voce Examination

**Viva-voce Examination: This shall be done under two headings and shall carry 100 marks**

1. A. Thesis presentation (of about 15 mins duration)  
B. Pedagogy (20 mins duration plus 10 mins for questions) (A and B: 20 marks)
2. Grand viva: 80 marks

**Scheme of examination**

**a) The examination for the degree shall consist of written exams, clinicals / practicals and viva voce. b) The examination shall be conducted ordinarily twice a year.**

Paper	Duration	Marks
Theory paper-1	3 hours	100
Theory paper-2	3 hours	100
Theory paper-3	3 hours	100
Theory paper-4	3 hours	100
Clinicals/Practicals		200
Viva-voce		100

**Clinical/Practical and viva-voce examination will be of two days duration.**

**Thesis**

The student should submit Thesis six months before the final examination. Those students who have not submitted the thesis shall not be allowed to appear for the final examination. Only those students whose theses have been approved by three examiners shall be eligible to appear for the final examination.

Thesis work shall be done under the guidance of the faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

Co-guide: Faculty of the cadre of Assistant Professor and above from the same or other departments who are involved in guiding the student may be proposed as co-guides by the guide subject to approval by the head of the department and the dean.

### **Internal assessment**

Periodically assessment of the candidate shall be done at least twice in a year. The internal assessment includes Theory and Practical examinations. The marks obtained will not be considered for university examination.

### **Eligibility for award of degree**

A candidate shall be declared to have become eligible for the award of M.D. degree in biochemistry provided he/ she obtains in the final examination 40% marks in each theory paper and not less than 50% cumulatively in all the four papers and 50% of the marks in clinicals/ practicals and viva voce put together.

### **Panel of examiners**

a) There shall be a panel of eight external examiners as advised by the Head of the department and approved by the Director.

b) Theory paper setting to be done by the examiners from outside the state of Andhra Pradesh who may or may not involved in the concerned Clinical/Practical examination.

c) No. of Examiners Required - Four  
No. of Internal Examiners - Two  
No. of External Examiners - Two

At least 50% of the external examiners should be from outside the state of Andhra Pradesh.

Internal examiners may be from within the institute / within or outside Andhra Pradesh.

### **Appointment of Examiners:**

1. No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
2. If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
3. An examiner shall ordinarily be appointed for not more than two consecutive terms
4. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.
5. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .
6. There shall be a panel of 8 External Examiner as advised by the HOD concerned. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

#### **Marking System for the Examination:**

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

### **EXAMINATION PATTERN**

#### **THEORY EXAMINATION**

- Paper I: Biomolecules, cell biology, biochemical techniques, biostatistics and research methodology, basics of medical education in teaching and assessment of biochemistry
- Paper II: Enzymes, bioenergetics, biological oxidation, metabolism of biomolecules, intermediary metabolism and regulation, inborn errors of metabolism and nutrition
- Paper III: Molecular biology, molecular and genetic aspects of cancer, immunology and effects of environmental pollutants on the body

Paper IV: Basic principles and practice of clinical biochemistry, Laboratory management along with Total quality management and analytical techniques, Clinical correlates and analytical procedures including molecular diagnostics related to different body systems/organs, endocrinology, and recent advances in biochemistry

### MODEL QUESTION PAPER

Each theory paper : Duration 3 hours 100 X 4 = 400 Marks

1. Ten questions 10 marks each

Practical examination: Duration : 2 days 200 Marks

1. Experiment 1 50 Marks

Question involving estimation of at least two parameters using end point assay. One of them to be estimated along with calibration curve and within run precision.

2. Experiment 2 40 Marks

Question involving assay of hormone/ tumor marker by ELISA.

3. Experiment 3 20 Marks

Question involving Screening tests for inborn errors/body fluid analysis

4 Experiment 4 50 Marks

Question involving performance or Chromatography Or Electrophoresis

5. Experiment 5 40Marks

Interpretative skills –

Data presentation and analysis using excel spreadsheet solutions along with drawing of conclusions Clinical investigation reports in the form of lab reports, graphs, charts etc – for interpretation of results.

**Viva voce examination** 100 Marks

1. General viva voce. 80 Marks

2. Thesis presentation (of about 15 mins duration)

Pedagogy (20 mins duration plus 10 mins for questions) 20 Marks

**Total 700 Marks**

### **IX. (LOG BOOK)**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUPATI  
(A University Established Under the State Act)**



**LOG BOOK FOR POSTGRADUATES  
MD [Biochemistry].**

**Name of the Candidate** :.....

**Date of Admission** : .....

**Admn. No.** : .....

**DETAILS OF POSTINGS OVER 3 YEARS**

**1<sup>ST</sup> YEAR**



MONTH	AREA OF POSTING
May	
June	
July	
August	
September	
October	
November	
December	
January	
February	
March	
April	

Signature of Faculty:

Total:

**2<sup>nd</sup> YEAR**

MONTH	AREA OF POSTING
May	
June	
July	
August	
September	
October	
November	
December	
January	
February	
March	
April	

Signature of Faculty:

Total:

**3<sup>rd</sup> YEAR**

MONTH	AREA OF POSTING
May	

June	
July	
August	
September	
October	
November	
December	
January	
February	
March	
April	
May	
June	

**Signature of Faculty:**

**Total:**

**NIGHT DUTY 1st year :** Timings :- 6 PM-6 AM, with 2 hours break in between  
**Nature of work :-** To attend to emergency and critical samples reporting.

**They should inform any problems in the laboratory to the faculty on call.**

Month	Dates	
May		
June		
July		
August		
September		
October		
November		
December		
January		
February		
March		
April		

**Signature of Faculty:**

**Total:**

**NIGHT DUTY 2<sup>nd</sup> year :** Timings :- 6 PM-6 AM, with 2 hours break in between  
**Nature of work :-** To attend to emergency and critical samples reporting.  
**They should inform any problems in the laboratory to the faculty on call.**

Month	Dates	
May		
June		
July		
August		
September		
October		
November		
December		
January		
February		
March		
April		

Signature of Faculty:

Total:

NIGHT DUTY 3<sup>rd</sup>year : Timings :- 6 PM-6 AM, with 2 hours break in between  
 Nature of work :- To attend to emergency and critical samples  
 reporting.

They should inform any problems in the laboratory to the faculty on call.

Month	Dates	
May		
June		
July		
August		
September		
October		
November		
December		
January		
February		
March		
April		

HOD

Signature of the student

PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

NAME OF THE POSTGRADUATE

:

PERIOD OF ASSESSMENT

:

DATE

TO  
YEAR

MONTH  
DATE

YEAR  
MONTH

DATE

TO  
YEAR

MONTH  
DATE

YEAR  
MONTH

DATE

TO  
YEAR

MONTH  
DATE

YEAR  
MONTH

POSTING DURING ABOVE PERIOD

: CLINICAL LAB

Areas of exposure : Validation of clinical laboratory reports, method evaluation, internal quality assurance.

ASSESSMENT DONE BY :

QUALITY BEING ASSESSED

GRADE

1. Lab reporting/ student training
2. Academic Knowledge About laboratory
3. Curiosity about unexplained Observations
4. Academic Presentation
5. Punctuality / discipline

OVERALL GRADE

A- Good

B- Satisfactory

C- Poor

PROFORMASHOWN TO POSTGRADUATE CONCERNED :

SIGNATURE OF CONCERNED POSTGRADUATE :

CONCERNED FACULTY :

**PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES**

**NAME OF THE POSTGRADUATE :**

**PERIOD OF ASSESSMENT :**

<b>DATE</b>		<b>TO</b>	<b>MONTH YEAR</b>		
		<b>YEAR</b>	<b>DATE</b>	<b>MONTH</b>	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

<b>DATE</b>		<b>TO</b>	<b>MONTH YEAR</b>		
		<b>YEAR</b>	<b>DATE</b>	<b>MONTH</b>	
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<b>DATE</b>		<b>TO</b>	<b>MONTH YEAR</b>		
		<b>YEAR</b>	<b>DATE</b>	<b>MONTH</b>	
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**POSTING DURING ABOVE PERIOD : UG LAB**

**Areas of exposure : Undergraduate practicals, basics of laboratory work preparation of reagents and solutions end point and kinetic assays.**

**ASSESSMENT DONE BY :**

**QUALITY BEING ASSESSED GRADE**

1. **Lab reporting/ student training**
2. **Academic Knowledge About laboratory**
3. **Curiosity about unexplained Observations**
4. **Academic Presentation**
5. **Punctuality / discipline**

**OVERALL GRADE**

**A- Good                                  B- Satisfactory                                  C- Poor**

**PROFORMASHOWN TO POSTGRADUATE CONCERNED :**

**SIGNATURE OF CONCERNED POSTGRADUATE :**

**CONCERNED FACULTY :**

**PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES**

**NAME OF THE POSTGRADUATE :**

**PERIOD OF ASSESSMENT :**

<b>DATE</b>		<b>TO</b>		<b>MONTH YEAR</b>	
		<b>YEAR</b>		<b>DATE</b>	<b>MONTH</b>
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<b>DATE</b>		<b>TO</b>		<b>MONTH YEAR</b>	
		<b>YEAR</b>		<b>DATE</b>	<b>MONTH</b>
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<b>DATE</b>		<b>TO</b>		<b>MONTH YEAR</b>	
		<b>YEAR</b>		<b>DATE</b>	<b>MONTH</b>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

<b>DATE</b>		<b>TO</b>		<b>MONTH YEAR</b>	
		<b>YEAR</b>		<b>DATE</b>	<b>MONTH</b>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**POSTING DURING ABOVE PERIOD : PG LAB**

**ASSESSMENT DONE BY :**

<b>QUALITY BEING ASSESSED</b>	<b>GRADE</b>
-------------------------------	--------------

- |    |  |
|----|--|
| 1. | Lab reporting/ student training          |
| 2. | Academic Knowledge About laboratory      |
| 3. | Curiosity about unexplained Observations |
| 4. | Academic Presentation                    |
| 5. | Punctuality / discipline                 |

**OVERALL GRADE**

<b>A- Good</b>	<b>B- Satisfactory</b>	<b>C- Poor</b>
----------------	------------------------	----------------

**PROFORMA SHOWN TO POSTGRADUATE CONCERNED :**

**SIGNATURE OF CONCERNED POSTGRADUATE :**

**CONCERNED FACULTY :**

**THEORY/TUTORIAL/PRACTICAL CLASSES TAKEN**

<b>TOPIC</b>	<b>COURSE FOR WHICH TAKEN</b>

**PRACTICAL CLASSES**


**HOD**





### Guide lines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\*Corollary Grading in all Checklists:

Poor-0,Satisfactory-1,Average-2,Good-3,VeryGood-4.



Guidelines for evaluation of Journal presentations

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material, Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper/ subject
6.	Audio-Visual aids used
7.	Ability to analyse the paper and co-relate with the Existing knowledge
8.	Clarity of presentation
9.	Any other observation

\*Corollary Grading in all Checklists:  
 Poor-0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**INTERDEPARTMENTAL SEMINARS**

S.No.	Date	Topic	Moderator	Signature of Moderator

**AUDIENCE :** The interdepartmental seminars are attended by faculty and post graduate students of all the departments in the institute as well as by the Dean and Director of the institute.

**Thesis topic** :

**Ethical committee approval** :

**Thesis committee approval** :

**Guide** :

**Co-guide** :

**HOD**





**CONFERENCES ATTENDED**

<b>Date</b>	<b>Name</b>	<b>Role</b>

**PUBLICATIONS**

<b>Date</b>	<b>Topic</b>	<b>Journal</b>	<b>Role</b>

**HOD**





## SUMMARY OF LOGBOOK

(To be filled at the end of the course & retained in this book)

Name of the student: \_\_\_\_\_ Admn.No. \_\_\_\_\_

Name of the Course: \_\_\_\_\_ From \_\_\_\_\_ To \_\_\_\_\_

Name of the Institute: \_\_\_\_\_

- |    |                                  |                 |               |
|----|----------------------------------|-----------------|---------------|
| 1) | No.of Seminar presentations      | :Presented..... | Attended..... |
| 2) | No.of Journal club Presentations | :Presented..... | Attended..... |
| 3) | No.of Clinical Presentations     | :Presented..... | Attended..... |
| 4) | No.of Case Presentations         | :Presented..... | Attended..... |
| 5) | No.of UG Teaching Programms      | :Conducted..... | Attended..... |

(Theory class/ Clinics/ Practicals/ Demonstrations/ Tutorials)

- |     |  |                               |
|-----|--|-------------------------------|
| 6)  | No.of PG Teaching Programmes           | :Attended                     |
| 7)  | Special techniques:                    |                               |
|     | Performed                              | Assisted                      |
| 8)  | No.of Clinico Pathological Conference  | : Attended.....               |
| 9)  | No.of special investigations           | :Performed..... Assisted..... |
| 10) | No.of events attended Conferences..... | Symposia.....                 |
|     |  | Workshops.....CME.....        |
| 11) | Any other activities                   | :                             |

*Signature of the candidate*

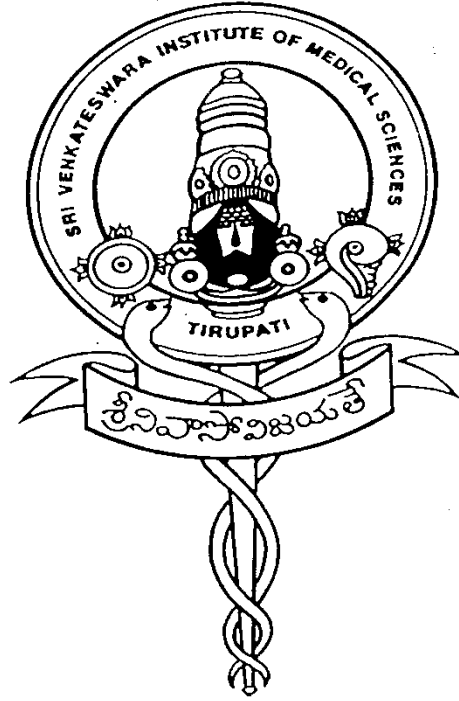
*Signature of the Course In-charge*

*Signature of the HoD  
With seal*

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI - 517 507**



**M.D. - EMERGENCY MEDICINE**

**COMMON BOARD OF STUDIES MEETING**

**ON 22.07.2021**

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**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES  
TIRUAPATI**

**M.D. (EMERGENCY MEDICINE)**

**COMMON BOARD OF STUDIES MEETING ON 22.07.2021**

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# SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI

## M.D. (EMERGENCY MEDICINE)

### COMMON BOARD OF STUDIES MEETING ON 22.07.2021

#### List of Members

1. Dr. B.Siddhartha Kumar - Vice Chairman  
Dean, SVIMS, Tirupati.
2. Dr. K.V.Sreedhar Babu - Member  
Registrar, SVIMS, Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr Vivekanandan - External expert  
Professor & Head  
Dept. of Emergency Medicine  
JIPMER, Pondicherry
5. Dr A. Krishna Simha Reddy - Internal Expert  
Professor  
Dept. of Emergency Medicine  
SVIMS, Tirupati
6. Dr. Ram - Internal Expert  
Professor and HOD of Nephrology  
SVIMS, Tirupati

## I. REGULATIONS

a) **Short Title and Commencement**

The programme shall be called Doctor of Medicine ( Emergency Medicine )

b) **Eligibility for admission:**

A candidate seeking admission into the course shall have MCI / NMC recognized MBBS qualification.

c) **Admission:**

In order to be **eligible** for admission to any postgraduate course in a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in 'National Eligibility-cum- Entrance Test for Postgraduate courses' held for the said academic year.

d) **Duration of the course:**

The duration of the course shall be three calendar years (including the period of examination).

e) **Bond:**

- i. The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/- value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. **5,00,000/- (Rupees Five Lakhs only)** along with the full stipend amount received by him/her back to the Institute.
- ii. The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.**20,00,000 (Rupees Twenty lakhs only)**.

**f) Training Programme:**

The candidate joining the course must work as full time Resident during the period of Post Graduate Training.

*Note: In-Service candidate will not be paid stipend if He / She draws leave salary in that parent institution.*

**g) External training:**

The residents are permitted for external posting during the training period on payment of stipend for a period not exceeding one month as per the need and on recommendation of the HoD. The request for such training shall be submitted to the Dean, SVIMS through proper channel, two months in advance in order to process with the institution where the posting is required. The expenditure towards travel, accommodation and fees shall be borne by the individual.

**h) Research Methodology:**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

**i) Attendance:**

All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

**j) Thesis:**

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the examiners.

**k) District Residency Programme (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as **“District Residency Programme (DRP)”** and the postgraduate medical student undergoing training shall be termed as a **“District Resident”**.

**POSTING SCHEDULE**

During 1<sup>st</sup> and 3<sup>rd</sup> years , the post graduates are posted in the department and in 2<sup>nd</sup> year they are rotated in other departments as follows;

2<sup>nd</sup> Year

Sl. No.	Month	Area of posting	Department / unit	No. of night duties
1.	1 <sup>st</sup>	Medicine		
2.	2 <sup>nd</sup>	Cardiology		
3.	3 <sup>rd</sup>	General Surgery		
4.	4 <sup>th</sup>	Orthopedics		
5.	5 <sup>th</sup>	Pediatrics		
6.	6 <sup>th</sup>	ICU		
7.	7 <sup>th</sup>	ENT and Skin & VD		
8.	8 <sup>th</sup>	Ophthalmology and Psychiatry		
9.	9 <sup>th</sup>	Anesthesiology and Radiology		
10.	10 <sup>th</sup>	OBG & Gynecology and Neurology		
11.	11 <sup>th</sup>	Neurosurgery and Plastic Surgery		
12.	12 <sup>th</sup>	Casualty		

## II. ASSESSMENT

### a) FORMATIVE ASSESSMENT:

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

#### General Principles:

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based / Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form. The results of formative assessment should be maintained in the student appraisal form itself and communicated in the same format to the Examination Section while applying for the Summative Examination.

- **Internal Assessment:**

Internal assessment should be done daily to assess the training and to identify the strengths and weaknesses of the postgraduate student.

1. Log Book (Appendix 1) with details of duration of postings, skills performed with remarks of the Teacher / Faculty member will be maintained and periodically updated by the postgraduate student.
2. Research work to be assessed and reviewed once in four months by the guide and the Head of the Department.
3. Evaluation sheets for seminar and journal clubs with the following points for the purpose of assessment.

- (i) Choice of article / topic (unless specifically allotted).



- (ii) Completeness of presentation.
- (iii) Clarity and cogency of presentation.
- (iv) Understanding of the subject and ability to convey the same.
- (v) Whether relevant references have been consulted.
- (vi) Ability to convey points in favour and against the subject under discussion.
- (vii) Use of audio-visual aids.
- (viii) Ability to answer questions.
- (ix) Time scheduling.
- (x) Overall performance.

#### **b) SUMMATIVE ASSESSMENT:**

**Summative Assessment** i.e., assessment at the end of training . The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 as amended from time to time. The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

#### **Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than

eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.

3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three examiners concerned.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

### **III. FORMAT OF THE EXAMINATION**

The examinations shall be organized to evaluate and certify candidate level of knowledge, skill and competence at the end of the training. The examination for MD in Emergency Medicine shall be held at the end of 3<sup>rd</sup> academic year.

Postgraduate examinations, in any subject shall consist of Thesis , Theory Papers, and Clinical/Practical and Oral examinations.

#### **1. Thesis**

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a thesis. The thesis work is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

- **Guide :**

The thesis work shall be done under the guidance of the faculty recognized as post graduate teacher as per the norms laid down by the MCI. However, the decision of the HOD concerned is final in allocation of guide to each post graduate.

- **Co-guide:**

The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.

- **The Thesis topic:**

The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the thesis protocol approval committee (TPAC) constituted by the institution, during its meeting proposed to be held in the month of January every year.

- After obtaining approval from TPAC, the thesis protocol shall be submitted in February to Institutional Ethics Committee (IEC) for clearance.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II), six months before the Theory and Clinical / Practical examination
- The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical / Viva examination. .
- The Guide and Co-Guides cannot be nominated as external or internal examiners for evaluation of thesis.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the Head of the Department.. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

- **Change of guide:**

In the event of a registered guide leaving the college for any reason or in the event of death, the guide, may be changed with prior permission from the Committee constituted by the Head of the Department and the Dean.

## **2. Theory:**

There shall be four theory papers, each of 3 hours duration. Out of these one shall be of Basic Medical Sciences and one shall be on recent advances

4 Theory papers 100 marks for each paper. Total - 400 Marks

Applicable to all papers uniformly: 10 questions x 10 marks = 100 marks

Total - 400 Marks

Choices: Nil

<b>Paper Title</b>	<b>Duration</b>	<b>Marks</b>
1) Applied Basic Sciences applicable to Emergency Medicine	3 Hrs	100
2) Medical Emergencies in Adult and Pediatrics	3 Hrs	100
3) General Principles of Emergency Care in Surgery and Surgical Specialties	3 Hrs	100
4) Recent Advances in Emergency Medicine	3 Hrs	100

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.

- Moderation of Question Papers :

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

**3. Clinical/Practical & Viva Voce Examination :**

- Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.
- The maximum number of candidates to be examined in Clinical and Oral on any day shall not exceed eight for M.D degree .

**Marks for Practical/Clinical & Viva voce ( Total 300 marks)**

Practical/Clinical examination shall consist of carrying out special investigative techniques for Diagnosis and Therapy.

**Practical / Clinicals (one day) 200 marks**

- One long case - 100 marks
- Short cases 2 (50x2) - 100 marks

**Viva Voce: 100 marks**

Skill stations

- ACLS - ABG
- ATLS - Drugs
- 2D Echo - Instruments
- ECG - Ventilator
- Radiology station

Total: -----  
300 marks  
-----

### **Marking System for the Examination :**

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.
4. The above class will not be awarded if the candidate shall not complete the course within the duration of the course period. Such candidates will be treated under "Pass" category.

### **Appointment of Examiners :**

- All the Post Graduate Examiners shall be recognized Post Graduate Teachers holding recognized Post Graduate qualifications in the subject concerned.
- No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
- As per MCI, the Teachers in a medical college or institution having a total of 8 years teaching experience out of which at least 4 years teaching experience as Assistant Professor with at least one research publication in indexed journals gained after obtaining postgraduate degree shall be recognized as post graduate teacher in broad specialties.
- For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .
- There shall be a panel of eight external examiners from outside the state as advised by the Head of the department. The Controller of Examinations shall have the

powers to appoint two examiners from among the panel of examiners recommended by the HOD.

- Total number of examiners required - Four
  - Internal Examiners - Two
  - External Examiners - Two
  
- The Controller of Examinations shall have the powers to appoint two external examiners from among the panel of examiners recommended by the HOD.
  
- No. of Internal Examiners - Two (HoD and one eligible PG Teacher). If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
  
- An examiner shall ordinarily be appointed for not more than two consecutive terms.
  
- The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

#### IV. SYLLABUS

##### **Pre-hospital Care**

Emergency Medical Services  
Prehospital Equipment and Adjuncts  
Air Medical Transport  
Neonatal and Pediatric Transport  
Mass Gatherings

##### **Disaster Preparedness**

Disaster Medical Services

- Bioterrorism Response: Implications for the Emergency Clinician
- Disaster management for Chemical Agents of Mass Destruction
- Blast and Crush Injuries
- Radiation Injuries

## **Resuscitative Problems and Techniques**

Sudden Cardiac Death  
Basic Cardiopulmonary Resuscitation in Adults,  
Neonatal Resuscitation and Emergencies,  
Pediatric Cardiopulmonary Resuscitation and  
Pediatric Airway Management  
Resuscitation Issues in Pregnancy,  
Ethical Issues of Resuscitation  
Noninvasive Airway Management  
Tracheal Intubation and Mechanical Ventilation  
Surgical Airway Management,  
Vascular Access  
Invasive Monitoring,  
Pacing Techniques, and  
Automatic and Implantable Defibrillators  
Cerebral Resuscitation, Newer Resuscitative Techniques and Acid-Base Disorders  
Blood Gases: Pathophysiology and Interpretation Fluid and Electrolyte Problems  
Disturbances of Cardiac Rhythm and Conduction, Pharmacology of  
Antidysrhythmic and Vasoactive medications

## **TRAUMA CARE**

### **Traumatic Disorders**

#### **Principles of care**

Prehospital trauma care and Triage  
Resuscitation and stabilization  
Hemorrhagic shock, Neurogenic shock  
Role of emergency physician, Team response, Reassessment and monitoring  
Diagnosis, Treatment, Consultation, Disposition  
Injury prevention and control

#### **Cause of injury**

Homicide, Suicide, Family violence, Motor vehicle crashes, Falls, Drowning/near drowning, Poisoning, Burns and fire related injuries, Occupational injuries

#### **Radiological evaluation**

Plain radiography, Contrast radiography, CT scan, Angiography, MRI, Ultrasound

#### **Mechanism of injury**

Blunt, Penetrating

- Gunshot wounds
- Stab wounds Kinematics



## **Diagnosis and management by anatomic areas**

Head trauma

Scalp lacerations/avulsions, Skull fractures, Brain concussions, contusions, Intracranial hematomas, Brain stem injuries, Penetrating head trauma, Cerebro spinal fluid leaks

## **Spinal cord and peripheral nervous system trauma**

Complete spinal cord injuries, Incomplete cord injuries, Cauda equina injuries  
Nerve root injuries Brachial and lumbo sacral injuries, Peripheral nerve injuries

## **Injuries of the spine**

Fractures

- Cervical, Thoracic, Lumbar, Sacral/coccygeal
- Dislocations/subluxations
- Dislocations/subluxations
- Unilateral facet
- Bilateral facet Ligamentous injuries
- Ligamentous injuries

## **Facial fractures**

Frontal sinus, Mandibular, Maxillary, Nasal, Orbital  
Dental fractures and avulsions, Zygomatic

## **Soft tissue facial injuries**

Complex lacerations, Avulsions, Severe abrasions, Parotid gland/duct injuries,  
Nerve injuries

## **Ophthalmologic trauma**

Corneal abrasions/lacerations, Foreign bodies, Iritis, Hyphema, Lens dislocations,  
Retinal detachment, Penetrating globe injuries, Eyelid lacerations, Lacrimal duct  
injuries Corneal burns

- Acid
- Alkali
- Ultra violet

## **Otologic trauma**

Lacerations and Avulsions  
Sub-pericondrial hematoma Tympanic membrane perforation

## **Neck trauma**

Vascular injuries

Carotid artery, Internal and external jugular veins, Thoracic duct Penetrating neck  
trauma, Anterior and posterior triangle injuries

## **Laryngotracheal injuries**

Lacerations and Crush injuries  
Vocal cord avulsions/hematomas Fracture larynx  
Tracheal transection Compression with hematomas

## **Chest trauma**

Penetrating chest trauma, Rib fractures, Sternal fractures, Flail chest, Clavicle fracture/dislocation, Aortic disruption, Myocardial contusion, Pulmonary contusion, Pericardial tamponade, Vascular injuries, Tracheo bronchial tree injuries, Pneumo thoraces, Hemothorax

## **Abdominal trauma**

Penetrating abdominal trauma Abdominal wall contusion Solid-viscus injuries, Hollow viscus injuries Vascular injuries Diaphragmatic rupture Evisceration, Mesenteric avulsion, hematoma Bladder rupture, contusion Renal injuries, Ureteral injuries

## **Upper extremity bones and joints**

## **Lower extremity bones and joints**

### **Pelvic fractures**

Pubic rami, Straddle, Iliac crest, Malgaigne

### **Soft tissue extremity injuries**

Tendon injuries, Periarticular injuries, Injuries to joints, Compartment syndromes/crush injuries, Penetrating soft tissue injuries, Degloving injuries, Amputations/replantation, Vascular injuries

## **Injuries of the genitalia**

### **Cutaneous injuries**

Lacerations, Avulsions, Burns, Puncture wounds, Bite wounds

### **Poly trauma / multiple skeletal injuries**

### **Trauma in pregnancy**

Principles of care, Clinical assessment and management  
Anatomic/physiologic alterations in the pregnant woman

Fetal monitoring, Emergency department cesarean section Type of injuries, Uterine rupture, Placental abruption, Preterm labor, inutero injuries to the fetus, Penetrating injuries to the uterus

## **Special considerations for pediatric trauma victim**

## UROGENITAL / GYNAECOLOGICAL DISORDERS

### Genital tract/ female

#### Ovarian disorders

Ovarian cyst, Ovarian torsion

### Vagina and vulva

#### Uterus

Endometriosis, Dysfunctional uterine bleeding, Tumors

### Infectious disorders

#### Genital tract/ Male

Congenital, Structural, Inflammatory/ infection

### Sexual assaults

### When Pregnancy is not likely -abdominal pain and abnormal vaginal bleeding

Ectopic pregnancy, Abortions - Molar pregnancy, Twisted ovarian tumors, Emergency contraception, Rape victims, Domestic battering

## CLINICAL PHARMACOLOGY

### Principles

Pharmacokinetics  
Drug interactions  
Allergic reactions  
Drugs in pregnancy / breast feeding  
Effect of age  
Withdrawal syndrome  
Neonatal / pediatric considerations

### Drug classes

- Drugs acting on various systems
- CVS
  - Nervous System
  - Respiratory System
  - GIT
  - Blood
  - Genito Urinary System
  - Immune System
  - Drugs used in Anaesthesia
  - Psychiatric Drugs
  - Antibiotics

## MEDICINE

### ENDOCRINE, METABOLIC AND NUTRITIONAL DISORDERS

Acid base balance and its disturbances

Fluid and electrolyte and its disturbances

Normal Glucose metabolism

Diabetes mellitus

- Diabetic ketoacidosis
- Hyper osmolar coma
- Hypoglycemic syndrome

Nutritional disorders

Endocrine Emergencies

### ENVIRONMENTAL DISORDERS

Diving emergencies by drowning

Acute gas embolism

Decompression sickness

**Submersion incidence**

Cold water immersion+

Near drowning

Electrical injury

Lightning injury

AC/DC current

High voltage

High altitude illness

Acute mountain sickness

High-altitude cerebral edema

High-altitude pulmonary edema

Radiation injury

Poisonous plants

Smoke inhalation

Temperature related illness

Heat

Cold

- Hypothermia
- Frost bite

## **Bites and stings**

- Insects
- Scorpions
- Reptiles
- Snake

## **HEMATOLOGICAL DISORDERS**

### **Hemostatic disorders**

#### **Congenital and acquired disorders of clotting and bleeding**

### **Red Blood cell disorders**

Anemias  
Polycythemia  
Haemoglobinopathies

### **Transfusions**

Principles of blood transfusion

- Auto transfusion
- Massive transfusions
- Component therapy
- Synthetic blood replacement
- Indications for transfusion

## **IMMUNE SYSTEM DISORDERS**

### **Hypersensitivity**

Anaphylactic/anaphylactoid reactions, Angioedema  
Allergic rhinitis, Drug allergies, Serum sickness

## **SYSTEMIC INFECTIOUS DISORDERS**

### **Bacterial**

- Botulism
- Gas gangrene
- Bacteremia and sepsis
- SIRS
- Mycobacterial infections
  
- Meningococemia
- Plague
- Tetanus
- Dengue
- Typhoid
- Toxic shock syndrome
- Spirochaetes
- Chlamydia
- Mycoplasma

## **Protozoal - parasites**

Malaria

## **Viral**

HIV

Infectious mononucleosis

Dengue

Chicken pox

Influenza, H, N,

Mumps

Polio

Rabies

Rubella

Roseola

Varicella/zoster

Herpes simplex

## **Travel related**

### **Prevention**

Prophylaxis

Immunisations

## **MUSCULOSKELETAL DISORDERS (NON TRAUMATIC)**

### **Joint abnormalities**

Arthritis

- Septic
- Gout
- Collagen vascular
- Degenerative Osteochondritis dissecans

### **Disorders of the spine**

Ankylosing spondylitis

Spondylolysis / spondylolisthesis

Disc disorders

- Herniated nucleus pulposus
- Discitis

Low back syndromes

- Acute sprain
- Sacroiliitis
- Sciatica
- Cauda equina syndrome
- Spinal stenosis
- Overuse syndromes
- Tendinitis
- Bursitis
- Fibrositis

- Muscle strains
- Carpal tunnel syndrome Muscle abnormalities
- Muscular dystrophies
- Rhabdomyolysis
- Myositis
- Soft tissue infections
- Necrotising fasciitis
- Gangrene
- Paronychia
- Felon
- Tenosynovitis

## **NERVOUS SYSTEM DISORDERS**

### **Cerebro vascular accidents**

### **Cranial nerve disorders**

Bell's palsy

Trigeminal neuralgia

Other cranial nerves

### **Demyelinating disorders**

Multiple sclerosis

### **Infections/ inflammatory disorders**

Abscess

- Brain
- Epidural Encephalitis
- Meningitis
- Myelitis
- Neuritis

### **Neuromuscular disorders**

Landry's / Guillain - Barre syndrome

Myasthenia gravis

Amyotrophic lateral sclerosis

### **Peripheral neuropathy**

Compression syndromes

Toxic and other neuropathies

### **Spinal cord compression**

### **Seizure disorders**

Status epilepticus

Focal seizures

Generalised seizures  
Pseudo seizures

Headache  
Acute spinal cord injury  
Management of radiculopathy  
Myopathy Status epileptus  
Acute neuro muscular respiratory failures  
Management Unconscious patients

### **PSYCHOBEHAVIORAL DISORDERS**

Acute psychiatric emergencies and complications of drug abuse  
overdose of psychiatric

### **RENAL DISORDERS**

- AKI
- Dialysis
- CCRT
- Obstruction Uropathy

### **RESPIRATORY DISORDERS**

Acute upper airway obstruction  
Acute upper airway infection  
Foreign body airway  
Disorders of pleura, mediastinum and chest wall

- Costochondritis
- Mediastinal masses
- Mediastinitis
- Pleural effusions/ empyema
- Pleurisy
- Pneumomediastinum
- Pneumothorax
  - Spontaneous Pneumothorax
  - Iatrogenic
  - Tension Pneumothorax

Non cardiogenic pulmonary edema

- Obstructive restrictive lung disease
- Asthma
- Bronchitis
- Chronic obstructive pulmonary disease
- Industrial exposure of Physical and chemical irritants
- Corrosive agents



- Aspiration of gastric contents
- Pulmonary embolism
- Pulmonary infarcts
- Thoracic outlet syndrome
- Sleep apnea syndrome

## TOXICOLOGICAL DISORDERS

Principles

Toxicology information

Toxicology diagnostic modalities

Toxidromes

Treatment modalities

- Antidotes
- Skin decontamination
- Gastric decontamination
  - Emetics
  - Lavage Enhanced elimination Activated charcoal

Cathartics/ Diuresis

Dialysis

Withdrawal syndrome

Drugs and chemical classes causing toxicity

- Acetaminophen
- Alcohol
  - Ethanol
  - Ethylene glycol
  - Isopropyl alcohol
  - Methanol
- Analgesics/ Anaesthetics
- Anti cholinergics/ Cholinergics
- Anti coagulants
- Anti convulsants
- Anti depressants
  - Lithium
  - Monoamine oxidase inhibitors
  - Cyclic antidepressants
- Anti parkinsonism drugs
- Anti histamines
- Anti psychotics
- Bronchodilators
- Cannabis
- Carbon monoxide
- Cardiovascular drugs
- Caustic agents

- Cocaine
- Cyanides
- Corrosive acids
- Corrosive alkalies
- Hydrogen sulphides
- Food additives
- Halucinogens
- Hazardous material spills
- Heavy metals and chelation
- Household / industrial poisons
- Hormones and steroids
- Hydrocarbons / Halogenated hydrocarbons
- Hypoglycemics
- Inhaled toxins
- Iron
- Isonizid
- Local anaesthetics
- Local acting drugs
- Irritant bases
- Marine toxins
- Methemoglobinemia
- Mushrooms/ poisonous plants
- Nitrogen compounds
- NSAID's
- Organophosphates
- Opioids
- Oliandar
- Rat poison
- Salicylates
- Sedatives
- Stimulants
- Strychnine
- Weed killer

### **CRITICAL CARE**

Anti microbial therapy in critical care setting  
 Catheter colonization and Catheter related bacteremia  
 Invasive and noninvasive monitoring  
 Infections after solid organ transplantation  
 Management of HIV and AIDS related infection in the ICU  
 Malaria and Other tropical infections in the ICU  
 Intra abdominal sepsis  
 Laboratory diagnosis of infections  
 Mechanical ventilation  
 Noninvasive ventilation

Acute hypoxic respiratory failure

- Pathology of Acute Lung injury
- Pathophysiology and Management of Acute Respiratory distress syndrome
- Pulmonary aspiration
- Weaning from ventilatory support in hypoxic respiratory failure

Acute ventilatory failure

- Life threatening asthma
- Acute respiratory failure in patients with COPD
- Weaning from respiratory support in airflow obstruction states

Brain death

- Definition
- Determination
- Physiological effects on donor organs

Shock and various types

Inotropic therapy in critically ill patient Sedatives and analgesics in critical care

Neuro muscular blocking drugs in patients in the ICU Critical care imaging of chest

CT and MRI of the abdomen in the Critical care patient Interventional radiology in the critical ill patient

Imaging of the central nervous system in the critical care patient Echocardiography in critical care

## **CARDIOLOGY**

### **CARDIOVASCULAR DISORDERS**

Pathophysiology

- Congenital disorders
- Acquired disorders
- Aging

Diseases of the myocardium – acquired

- Cardiac failure
- Cardiomyopathy
- Ischemic heart disease
- Endocarditis
- Valvular heart disease
- Myocarditis

Diseases of the pericardium

- Pericarditis
- Pericardial effusion/tamponade

## Diseases of the conduction system

- Dysrhythmias
  - Atrial flutter / fibrillation
  - Atrial / junctional ectopy
  - Preexcitation syndromes
  - Supraventricular tachycardia / bradycardia
  - Ventricular flutter / fibrillation
  - Ventricular tachycardia
  - Ventricular ectopy
  - QT-Interval syndrome
- Conduction blocks
  - Sinotrial block
  - Sick sinus syndrome
  - Atrioventricular blocks (1; 2; 3)
  - Bundle - branch blocks

## Diseases of the circulation

- Acute arterial , venous and lymphatic disorders

## Hypertension

- Acute hypertensive crisis
- Chronic hypertension
  - Essential
  - Secondary

## Myocardial manifestations of the systemic diseases

### Treatment modalities

- Thrombolytic therapy
- Pharmacologic agents
- Cardiac pacemakers
  - Temporary
  - Permanent

## DERMATOLOGY

### CUTANEOUS DISORDERS

#### Dermatitis

- Acne
- Atopic
- Contact
- Dyshidrotic eczema
- Exfoliative

- Lichen simplex
  - Psoriasis
  - Seborrhea
  - Photosensitivity Infections
  - Bacterial
    - Abscess
    - Cellulitis/lymphangitis
    - Erysipelas
    - Folliculitis
    - Impetigo
    - Bacterial exanthems
  - Parasitic
    - Pediculosis
    - Scabies
  - Viral
    - Aphthous ulcers
    - Herpes simplex
    - Herpes zoster
    - Molluscum contagiosum
    - Warts
    - Viral exanthems Maculopapular lesions
  - Pupura and petechiae
  - Urticaria
  - Erythema multiforme
  - Erythema nodosum Vesicular / Bullous lesions
  - Pemphigus / pemphigold
  - Scalded skin syndrome
  - Toxic epidermal necrolysis
- Cutaneous manifestations of allergic reactions  
 Cutaneous manifestations of systemic diseases

## PAEDIATRICS

### **G I Tract**

Colic, formula intolerance Foreign body Gastroenteritis

Viral / Bacterial / Parasite / Allergic / Inflammatory bowel disease Gastro oesophageal reflux

GI bleeding

- Upper
- Lower

Surgical emergencies

- Tracheo oesophageal fistula / esophageal atresia
- Pyloric stenosis

- Malrotation / volvulus
- Intussuception
- Hernia - inguinal, umbilical
- Appendicitis

Acute pancreatitis

Hepatic coma / Fulminant hepatic failure

### **Cardio Vascular**

Arrhythmia

Congenital heart disease

- Left to right shunt
- Right to left shunt with hypoxic spells
- Obstructive lesions - Pulmonary / systemic Acquired heart diseases
- Pericardial effusion / pericarditis
- Infective endocarditis
- Myocarditis
- Rheumatic fever.

Congestive cardiac failure

Hypertension

### **Endocrine / Metabolic Disorders**

Diabetes mellitus / Diabetic Ketoacidosis

Hypoglycemia

Diabetes insipidus

SIADH

Hyper and hypoparathyroidism / hypocalcemia

Hypo and hyper thyroidism

Congenital adrenal hyperplasia / crisis

Cushing's syndrome

Inborn errors of metabolism

### **Hematologic**

Anaemia - Aplastic, nutritional, hemoglobin

Thalassemia, Sickle cell anaemia, Spherocytosis

Hemostatic disorders

- ITP
- DIC
- Inherited disorders of Hypercoagulation states
- Methemoglobinemia
- Leukemias

### **Neurology**

Acute encephalopathies - including Reye's syndrome

Meningitis / Encephalitis - viral, bacterial, tuberculosis Seizures

Febrile, Non-febrile, Epilepsy Status epilepticus

Hypoxic ischaemic encephalopathy Coma  
Raised intracranial tension – hydrocephalus, pseudo tumour cerebri Acute flaccid  
paralysis  
Chorea  
Migraine CNS tumours  
Nerocysticerosis

### **Orthopedics**

Septic arthritis Osteomyelitis  
Transient synovites / reactive arthritis Tumours  
• Ewing's sarcoma

### **ENT**

Epistaxis  
Foreign body  
Naso pharyngitis  
Otitis externa  
Otitis media  
Tonsillitis  
Ludwig's angina  
Torticollis

### **R S Croup**

- ACTB
- Epiglottitis
- Spasmodic croup
- Foreign body
- Bronchiolitis
- Asthma

### **Status asthmaticus Pneumonia**

- Bacterial
- Viral
- Myoplasma
- Chlamydial
- Tuberculosis Aspiration pneumonia Pulmonary edema

Pleural effusion / emphysema Pneumothorax

Congenital abnormalities in respiratory tract Congenital diaphragmatic hernia

Apnea / Respiratory failure / Respiratory distress ARDS

Acute psychiatric problems in children

## **Infection**

Diphtheria  
Tetanus  
Pertussis  
Viral hemorrhagic fever / dengue  
Poliomyelitis  
Staphylococcus infection  
Meningococcus  
Haemophilus influenza  
Pneumococcus  
Rabies  
Herpes simplex  
Cholera  
Food poisoning  
Bacteremia / septicemia  
Viral exanthematous fevers  
Immunization  
Fever without localizing signs

## **Rheumatology**

Juvenile Rheumatoid arthritis  
Henoch-schonlein purpura / vasculitis  
Kawasaki syndrome  
SLE

## **Skin**

Cellulitis / Impetigo  
Urticaria / angioedema

## **Renal / genitourinary**

Congenital abnormalities of kidney  
Urinary tract infection - uncomplicated  
Complicated Acute glomerulonephritis  
Nephrotic syndrome Urolithiasis  
Renal tubular acidosis Acute renal failure

- Chronic renal failure Hemolytic uremic syndrome Penis
- Balanitis
- Phimosis / paraphimosis Testis
- Torsion

Undescended Testis

## **New born**

Resuscitation Transport  
Assessment - gestational age, sick new born Preterm / IUGR  
Jaundice



Sepsis – local, general Seizures

Birth asphyxia Birth trauma Bleeding neonate

Temperature regulation and hypothermia Hyaline membrane disease

### **Fluid and electrolytes**

General principles including type of fluid, composition, daily requirements Fluids in special situation including newborn

Specific disturbance

- Hyponatremia
- Hypernatremia
- Hypokalemia
- Hyperkalemia
- Disorders of calcium/magnesium Acid base balance

### **Critical care / problems**

BLS, PALS in children

Airway management

Rapid sequence intubation

Post intubation

Assisted ventilation

Pre hospital care

Transport of sick child

Post resuscitation stabilization Shock

Anaphylaxis

Temperature regulation

Component transfusion

Infection control

Vascular access

Drugs

### **Drug therapy in neonate and children**

#### **Poisoning and animal bites**

General principles of management

Salicylate poisoning

Acetaminophen poisoning

OPC, Organochlorines

Hydrocarbons

Acids / alkali

Oleander, Datura

Dapsone, anti convulsants, anti histamine, iron

Scorpion sting

Snake bite

**Environment**

Electrical injuries  
CO poisoning / smoke injuries  
Near drowning / drowning  
Heat stroke

**Burns****Paediatric trauma**

Epidemiology of child hood injuries  
Setting up of regional pediatric trauma centre  
Trauma score  
Thoracic injuries  
Abdominal trauma  
Genitourinary trauma

Evaluation of hand, soft tissue injuries,  
Envenomation injuries  
Musculoskeletal trauma  
CNS injuries  
Spinal injuries  
Vascular injuries

**Child abuse - physical, sexual****Emergency procedures**

Passing NG tube  
Catheterization  
ICT drainage, pleural tap  
Umbilical vein cannulation  
Ascitic tap  
Pericardial tap

**OBSTETRICS & GYNAECOLOGY****OBSTETRICS AND DISORDERS OF PREGNANCY**

Pregnancy, Uncomplicated  
Pregnancy, complicated

- Ectopic
- Hyperemesis gravidarum
- Abortion
  - Threatened
  - Inevitable
  - Incomplete
  - Complete

- Septic
- Missed
- Abruptio placenta
- Placenta praevia
- Toxemia / pregnancy induced hypertension
  - Pre-eclampsia
  - Eclampsia
- Rh Incompatibility
- Hydatiform mole
- Underlying illness
- Labor uncomplicated
- Labor complicated
  - Premature rupture of membranes
  - Preterm labor
  - Failure to progress
  - Fetal distress
  - Ruptured uterus
- Delivery, uncomplicated
  - Presentation
  - Position
  - Lie
- Episiotomy Delivery complicated
  - Presentation
  - Dystocia
  - Prolapsed cord
  - Retained placenta
  - Uterine inversion
  - Multiple births
  - Still birth
- Emergency cesarean section Post partum complication
  - Retained products of conception
  - Hemorrhage
  - Endometritis
  - Mastitis

### **When Pregnancy is suspected**

- Bleeding in pregnancy - SHOCK Retained placenta
- Abdominal pain during pregnancy
- Vomiting in pregnancy
- Seizures in pregnancy
- Headache and fever in pregnancy/ puerperal
- Injury to a pregnant woman (RTA)
- Recognition of risk factors in pregnancy
- Septic shock (CPR in Pregnancy)

## GENERAL SURGERY

### ABDOMINAL AND GASTROINTESTINAL DISORDERS

#### Oesophagus

Motor abnormalities

- Rupture
- Perforation (Boerhaave's syndrome)
- Tears (Mallory - Weiss syndrome)
- Hematoma
- Foreign body
- Diaphragmatic hernia
- Diverticula
- Caustic injury
- Herpetic esophagitis
- Acute amoebic hepatitis

#### Liver

- Hepatitis
  - Viral
  - Bacterial
  - Parasitic
  - Drug and toxin
- Alcoholic
- Prophylaxis
- Cirrhosis
  - Alcoholic
  - Viral
  - Biliary obstructive
  - Drug-induced
  - Toxin-induced
- Hepatic hepatorenal failure
- Abscess
  - Primary abscess
  - Metastatic abscess
- Hydatid liver
- Portal hypertension

#### Gall bladder and biliary tract

- Cholecystitis
- Cholangitis
- Cholelithiasis and choledocholithiasis
- Gallstone ileus
- Tumours

- Inflammatory disorders
- Gall stones

### **Pancreas**

#### Inflammatory disorders

- Acute pancreatitis
- Chronic pancreatitis
- Pseudocyst/abcess
- Pancreatic insufficiency Tumours
- Islet cell tumors
- Carcinoma

### **Stomach**

#### Structural lesions

- Volvulus
- Foreign bodies
- Rupture
- Gastric outlet obstruction Inflammatory disorders
- Acute gastritis
  - Stress-related
  - Corrosive gastritis
  - Drug induced Peptic ulcer disease
- Duodenal ulcer
- Gastric ulcer
- Acute gastrointestinal hemorrhage Tumours

### **Small bowel**

#### Motor abnormalities

- Obstruction
  - Mechanical
  - Adynamic
- Pseudoobstruction Structural disorders
- Aortoenteric fistula
- Malabsorption
- Meckel's diverticulum Inflammatory disorders
- Acute appendicitis
- Regional enteritis/crohn's disease Infectious disorders
- Viral
- Bacterial
- Parasitic

#### Tumours

#### Vascular disorders

- Mesenteric ischemia
- Ischemic colitis

## **Large bowel**

Motor abnormalities

- Irritable bowel
  - Constipation
  - Aganglionic megacolon/Hirschsprung's
  - Obstruction / pseudo obstruction
- Structural disorders
- Diverticular disease
  - Volvulus
  - Vascular dysplasia (angiodyplasia)
- Inflammatory disorders
- Ulcerative colitis
  - Radiation colitis

Infectious disorders

- Bacterial
- Viral
- Parasitic
- Antibiotic-associated Tumors

## **Rectum and Anus**

Structural disorders

- Anal fissure
  - Anal hematoma
  - Anorectal fistula
  - Hemorrhoids
    - Internal
    - External
  - Rectal prolapse
  - Foreign body
  - Perirectal abscess
  - Perianal / pilonidal abscess
- Inflammatory disorders
- Proctitis
  - Perianal hematoma

## **Abdominal wall**

Hernias

**Peritoneum**

Ascites

Peritonitis

Breast

Inguinal hernia

Hydrocele

Testis

Oesophago gastroscopy

## PLASTIC & RECONSTRUCTIVE MICRO SURGERY

### LECTURES

Wound healing

Wound care and dressings

Suturing

Skin grafting

Hand injury

- History and examination
- First AID
- Emergency room management
- Definitive treatment

### Burns

Types / classification / medicolegal aspects

Assessment of depth / % surface area and management of shock respiratory burns and complication First AID at site

Management - initial at emergency room Management subsequently

Other types of burns - Electrical, Chemical and Radiation

### Microsurgical emergency

Limbs / digits with vascular compromise

Amputation

Preservation of amputated part and care of stump

Do's and Don't's

### Degloving injuries of limbs

### Management and counselling in plastic surgical birth anomalies

Life threatening

Non life threatening

### Management of hand infection

### Basic Surgical Skills

- Suturing with fine suture 6.0 - 4.0 size
- I & D in hand infection
- I & D in facial abscesses
- Hand injury: debridement, repair, splinting
- Emergency escharotomy in burns

## OPHTHALMOLOGY

### Eye

Foreign body chemical in eyes

- External eye
- Anterior pole
- Posterior pole
- Orbit

Cavernous sinus thrombosis

Basic techniques of ophthalmic examination

- Orbit
- Adnexa
- Ocular motility
- Anterior segment
- Pupillary examination
- Posterior segment
- Orbital trauma
- Adnexal trauma
- Anterior segment trauma
- Optic nerve trauma

## PROCEDURE/SKILLS

- Bedside ophthalmic examination
- Direct ophthalmoscopy
  
- Eye patching, use of protective eye shield
- Taping of lids to prevent exposure
- Temporary tarsorrhaphy
- Eyelid laceration repair

## OTO-RHINO-LARYNGOLOGY

### EAR

Cellulitis / abscess of external ear

Foreign body

Labrynthitis

Malignant otitis externa

Mastoiditis

Otitis externa

Otitis media

Tympanic membrane perforation

Acute inflammation of ear

- Furuncle
- Otomycosis

Emergency management of Foreign bodies of external and middle ear



- Diagnosis and management

Trauma to external ear

- Haematoma auris
- Trauma to external auditory canal
- Fracture of temporal bone Trauma to tympanic membrane
- Traumatic perforation
- Blast injuries
- Fracture of skull base Neoplasam of external ear
- Impacted cerumen of external ear - diagnosis and management Inflammation of middle ear
- Acute ottits media with effusion
- Chronic ottits media - acute manifestations
- Complications of ottits media inter cranial and extra cranial
- Diabetic ottits media
- Fracture of temporal bone - classification, mechanism, diagnosis and management
- Management of acute vertigo - etiology, diagnosis and management
- Benign paroxismal, positional vertigo
- Labrinthits - viral, bacterial
- Noise induced hearing loss - blast injuries

## NOSE

Epistaxis

Nasal foreign body Rhinitis

Sinusitis

Anatomy of nose and para nasal sinosis Basic physiology

Epistaxis etio - pathology clinical features and management Vestbulitis - anterior rhinitis sinusitits

Fracture nasal bone

Tumours of nose, paranasal sinosis and nasopharynx, benign and malignant tumours of CFS Rhinorrhea

Fracture maxilla (le forts) Proptosis

Choanal atresia

## OROPHARYNX / THROAT

Foreign body

Gingivitis

Laryngitis

Ludwigs angina

Oral candidiasis

Pericondriitis

Periodental abscess

Tonsilitis / Peritonsilar abscess

Pharyngitis

Retropharyngeal abscess  
Stomatitis  
Temporomandibular joint disorders  
Uvulitis

#### Diseases of oral cavity & pharynx

- Stomatitis
- Ludwig's angina
- Tumours of oral cavity
- Ranula
- Haemangioma
- Lymphangioma
- Leucoplakia Tonsillitis & adenoiditis
- Acute
- Chronic Peritonsillar abscess

#### Acute & chronic pharyngitis

- Retropharyngeal abscess/parapharyngeal abscess
- Foreign bodies in pharynx
- Globus hystericus
- Sleep-apnoea syndrome
- Chemical trauma to pharynx
- Tumours of pharynx
- Temporomandibular joint dislocation
- Oesophagus
  - Anatomy & physiology of oesophagus
  - Oesophagitis
  - Foreign bodies of oesophagus
  - Dysphagia
  - Achalasia cardia
  - Malignant disease of oesophagus

## LARYNX

Anatomy of larynx

Physiology of larynx

Injuries of larynx (open & closed) Laryngo-tracheal stenosis

Acute laryngitis, epiglottitis, laryngo tracheo bronchitis Foreign bodies in the larynx  
(diagnosis & management) Benign & malignant tumours of larynx

Vocal cord paralysis Airway obstruction (stridor)

## **TRACHEA & BRONCHI**

Anatomy of trachea & bronchi Acute laryngo-tracheo-bronchitis  
Foreign bodies in the air & food passage  
(diagnosis & management) Neoplasms of trachea & bronchi Tracheostom

## **HEAD & NECK**

Anatomy of neck  
Benign tumors of neck  
Thyroid tumors  
Parapharyngeal space tumors & infection  
Fracture cervical spine  
Fracture skull base  
Fascial spaces of the neck  
Facial palsy

### **Special Situations**

Injection Drug Users  
The elder patient  
Adults with Physical Disabilities  
The Mentally Retarded Adult  
The Homeless Patient  
The Morbidly Obese Patient  
Patient Safety in Emergency Medicine  
Medico legal aspects of emergencies

## **PROCEDURES/ SKILLS**

### **Airway techniques**

Patent Airway Maintenance.....Jaw Thrust, Chin Lift

Use of Airways---Nasal , Oral

Cricothyrotomy Tracheostomy

Heimlechs maneuver

Intubation

- Esophageal obturator airway, LMA Insertion , I Gel
- Nasotracheal
- Oratracheal
- Rapid sequence intubation
- Fiber optic Mechanical ventilation
- Transport Ventilation
- Use of Ambu Bag and Bain Circuit

Percutaneous transtracheal ventilation Airway adjuncts Jet Ventilation

Local

Regional

Intravenous anaesthesia

Regional nerve blocks

General anaesthesia

Diagnostic procedures

Arthrocentesis, Cystourethrogram, Lumbar puncture, Nasogastric intubation  
Pericardiocentesis, Peritoneal lavage,

Bed side USG

F.A.S.T and E- F.A.S.T

Anoscopy

Thoracocentesis Tonometry

Fundal Examination

Slit lamp examination, ECG interpretation, Radiographic interpretation

Central venous line placement, Chest tube placement

**Genital / Urinary**

Bladder catheterization

Suprapubic catheterisation

Delivery of new born

**Head and neck**

Control of epistaxis

Laryngoscopy

Naso / Pharyngeal endoscopy

**Hemodynamic techniques**

Arterial catheter insertion

Central venous access

- Femoral
- Jugular
- Subclavian
- Umbilical
- Venous cut down
- Intraosseous infusion

Military anti shock trouser suit application and removal Peripheral venous cut  
down Pulmonary artery catheter insertion

## **Skeletal procedures**

Fracture dislocation immobilization techniques

Fracture dislocation reduction techniques

## **Spine**

- Cervical traction techniques
- Immobilization techniques (manual inline stabilization)
- Back board techniques
- MILS

## **Thoracic**

Cardiac pacing

- Cutaneous
- Transvenous

Defibrillation

Cardioversion

Pericardiotomy

Thorocostomy

Intra aortic balloon insertion

## **Other techniques**

End tidal CO<sub>2</sub> Monitoring Gastric lavage

Incision and drainage Intestinal tube insertion Burr holes

Pulse oximetry

Sengstaken blakemore insertion technique Wound closure techniques

Traphanisation - Nails

Peak expiratory flow rate measurement Excision of thrombosed hemorrhoids Foreign body removal

Conscious sedation Wound debridement

## **Laboratory skills**

Venepuncture

Arterial blood gas sampling

Microscopy

Gram stain

Preparation / interpretation

Use of point of care lab instruments

## **Multiple patient management**

### **Universal precautions**

### **ACLS**

### **Pericardio centesis**

### **Intraosseous needle**

## **V. RECOMMENDED BOOKS AND JOURNALS**

### **(a) Books:**

1. Emergency Medicine – A comprehensive Study Guide – VII Edition. – Judith Tintinalli
2. Text Book of Emergency Medicine, Chief Editor - Dr Suresh David , Ist edition 2012
3. Emergency Medicine – Concept and Clinical Practice –VII Edition, Rosen Barkin
4. Principle and Practice of Emergency Medicine – George Schwartz - IV Edition
5. Emergency Medicine – Hamilton
6. Essential of Immediate Medical Care, II Edition – Dr. C. John Eaton
7. Clinical Management of Drug Overdose and Poisoning, - Haddad, Shannon, Winchester
8. Emergency Department Management Principles and Application - Richard F Salluzzo
9. The Five Minute Emergency Medicine Consult - Rosen Barkin – III Edison
10. Disaster Medicine - David E Hugan
11. Text Book of Paediatric Emergency Medicine – Fleisher – XVII Edition
12. Medical Emergencies In Children - Meherban Singh
13. Drugs Therapy in Emergency Medicine - Joseph P. Ornato/Edgar R. Gonzalez
14. Hamilton Bailey's 1995 - Emergency Surgery - BW Ellis, 12<sup>th</sup> edition.
15. Davidson's Principles and Practices of Medicine
16. Clinical Medicine - Kumar & Clark
17. Harrisons Principles of Internal Medicine
18. Text Book of Critical Care – V Edition – Shoe maker
19. Gold frank's Toxicologic Emergencies – V Edition
20. Pediatric Emergency Medicine: A Comprehensive Study Guide by Gary R. Strange, William R. Ahrens, Steven Lelyveld, William Ahrens- McGraw-Hill Professional; 1st edition (August 1, 1995)
21. Emergencies in Obstetrics and Gynaecology (Oxford Handbooks in Emergency Medicine, Vol 8) by Lindsey Stevens, Anthony Kenney- Oxford University Press; (July 1, 1994)
22. Principles of Critical Care by Jesse B. Hall, Gregory A. Schmidt, Lawrence D. H. Wood- McGraw-Hill Professional Publishing; 2nd edition (January 1, 1998)

23. Critical Care by Joseph M. Civetta, Robert W. Taylor, Robert R. Kirby- Lippincott Williams & Wilkins; 3rd edition (January 15, 1997)
24. Emergency Medicine: Topics and Problems for Students by Jelinek- Blackwell Science Ltd; (September 28, 1999)
25. Accidents and Emergencies in Children (Oxford Handbooks in Emergency Medicine)
26. Acute Medical Emergencies by Ursula Guly, Drew Richardson- Oxford University Press; 3<sup>rd</sup> edition (January 15, 1996)
27. Outline of Fractures (Churchill Livingstone), 12<sup>th</sup> Edition, John Crawford Adams, David L. Hamblen
28. Outline of Orthopedics (Churchill Livingstone), 14<sup>th</sup> Edition, John Crawford Adams, David L. Hamblen.

**(b) Journals**

1. Emergency Medical Journal BMJ
2. Canadian journal of emergency medicine
3. Annals of Emergency Medicine
4. Paediatric Emergency Medicine journals
5. Journal of Accident and Emergency Medicine
6. The American journal of Emergency Medicine

## Postgraduate Students Appraisal Form

## Pre / Para /Clinical Disciplines

\*\*\*

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sl. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based/recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis/Research work										
7.	Log Book Maintenance										

Publications

Yes/No

Remarks\*

\_\_\_\_\_

\_\_\_\_\_

**\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

SIGN.OF ASSESSEE

SIGN.OF FACULTY I/C

SIGN.OF HOD

Annexure II



# PLAGIARISM

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI  
(A University established by an Act of A.P. State Legislature)

## GUIDELINES FOR 'PLAGIARISM' CHECK WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D students

**Ref.: Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for ThefRses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

### **1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

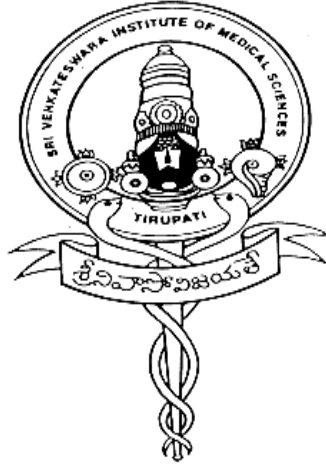
They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,

(A University established by an Act of Andhra Pradesh Legislature)

TIRUPATI - 517 507



LOG BOOK

COMMON FOR MD/ MS/ DM/ M.Ch. POSTGRADUATES

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

## PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :

*(Preferably be done by the faculty with whom the resident worked for most part of the period)*

Quality being Assessed

1. Patient Evaluation
2. Academic Knowledge About Patients Problems
3. Curiosity about unexplained Observations
4. Patient Care
5. Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

*Signature of the candidate*

*Signature of the guide    Signature of the HoD with seal*



Total :

3rd YEAR From..... To.....

MONTH	AREA OF POSTING	DEPARTMENT / UNIT	NO. OF NIGHT DUTIES

Total :

*Signature of Faculty :*

**Thesis Topic:**

**Guide:**

**Co-Guides :**

### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

## JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Journal Review Presentations

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material , Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyse the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**CASES PRESENTED IN MORTALITY CONFERENCE**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LAB / INVASIVE PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>



### CONFERENCES ATTENDED

S. No.	Name	Role	Signature of supervising Faculty

### PUBLICATIONS

S. No.	Topic	Journal	Role

### BEDSIDE CASE DISCUSSION

S. No.	Date	Diagnosis	Signature of Faculty Presented to

## SUMMARY OF LOG BOOK

(To be filled at the end of the course & retained in this book)

Name of the student : Admn.No.

Name of the Course : From\_\_\_\_\_ To\_\_\_\_\_

Name of the Institute:

- |  |   |                |
|--|---|----------------|
| 1) No. of Journal Review Presentations   | : Presented .....                         | Attended ..... |
| 2) No. of Seminar Presentations  | : Presented .....                         | Attended ..... |
| 3) No. of Clinical Presentations   | : Presented .....                         | Attended ..... |
| 4) No. of Case Presentations   | : Presented .....                         | Attended ..... |
| 5) No. of UG Teaching Programms<br>(Theory class / Clinics / Practicals /<br>Demonstrations / Tutorials) | : Conducted .....                         | Attended ..... |
| 6) No. of PG Teaching Programmes   | : Attended                                |                |
| 7) No. of Investigative Procedures   | : Performed .....Assisted.....Observed... |                |
| 8) No. of Major Operations /<br>Procedures /<br>Experiments  | : Performed .....Assisted.....Observed... |                |
| 9) No. of Minor Operations /<br>Procedures /<br>Experiments  | : Performed .....Assisted.....Observed... |                |
| 10) No. of Emergencies   | : Performed .....Assisted.....Observed... |                |
| 11) No. of Medicolegal work  | : Performed .....Assisted.....Observed... |                |
| 12) No. of Public Health Visit /<br>Social work /<br>Survey /<br>Immunization /<br>Camps                 |   |                |
| 13) No. of Clinico Pathological Conference:  | Presented .....                           | Attended ..... |
| 14) No.of special investigation /<br>Procedure   | : Conducted .....                         | Attended ..... |
| 15) No. of events attended   | Conferences..... Symposia .....           |                |
|  | Workshops ..... CME .....                 |                |
| 16) Any other activities   | :   |                |

*Signature of the candidate*

*Signature of the guide*

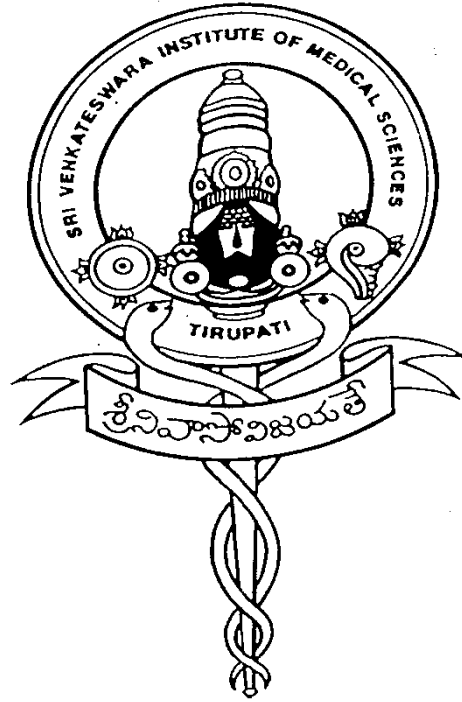
*Signature of the HoD with seal*

-o0o-

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI – 517 507**



**M.S. - GENERAL SURGERY**

**COMMON BOARD OF STUDIES MEETING**

**ON 22.07.2021**

---

**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUAPATI**

**M.S. (GENERAL SURGERY)**

**MD/MS COMMON BOARD OF STUDIES MEETING HELD ON 22.07.2021**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**

**M.S. (GENERAL SURGERY)**

**MD/MS COMMON BOARD OF STUDIES MEETING  
HELD ON 22.07.2021**

**List of Members:**

1. Dr B. Siddhartha Kumar - Chairman  
Dean,  
SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar,  
SVIMS, Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr N.V. Ramanaiah - External Expert  
Professor  
Dept. of General Surgery  
SV Medical College, Tirupati.  
Ph.No. 9441555790  
Email: dr.nannam.vr@gmail.com
5. Dr Y. Mutheeswaraiyah - Internal Expert  
Professor & HoD  
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## GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN GENERAL SURGERY

### I. PREAMBLE:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A post graduate specialist having undergone the required training should be able to recognize the health needs of the community should be competent to handle effectively medical / surgical problems and should be aware of the recent advances pertaining to his specialty. The PG student should be competent to provide professional services with empathy and humane approach. The PG student should acquire the basic skills in teaching of medical / para-medical students and is also expected to know the principles of research methodology and self-directed learning for continuous professional development.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

### II. REGULATIONS:

- a) **Eligibility for admission:** A candidate seeking admission into the course shall have MCI / NMC recognized MBBS qualification.
- b) **Admission:** In order to be **eligible** for admission to any postgraduate course in a particular academic year, it shall be necessary for a candidate to obtain minimum of 50% (Fifty Percent) marks in '**National Eligibility-cum- Entrance Test for Postgraduate courses**' held for the said academic year.
- c) **Duration of the course:** The duration of the course shall be three calendar years (including the period of examination).
- d) **Bond:**
  - i) The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/- value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. **5,00,000/- (Rupees Five Lakhs only)** along with the full stipend amount received by him/her back to the Institute.
  - ii) The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful

completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.20,00,000 (Rupees Twenty lakhs only).

- e) **Training Programme:** The candidate joining the course must work as full time Resident during the period of Post Graduate Training.

*Note: In-Service candidate will not be paid stipend if He / She draws leave salary in that parent institution.*

- f) **External training:** The residents are permitted for external posting during the training period on payment of stipend for a period not exceeding one month as per the need and on recommendation of the HoD. The request for such training shall be submitted to the Dean, SVIMS through proper channel, two months in advance in order to process with the institution where the posting is required. The expenditure towards travel, accommodation and fees shall be borne by the individual.

#### g) **Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

- h) **Attendance:** All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

### **i) District Residency Programme (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as “**District Residency Programme (DRP)**” and the postgraduate medical student undergoing training shall be termed as a “**District Resident**”.

### **III. SUBJECT SPECIFIC LEARNING OBJECTIVES:**

#### **Clinical Objectives**

At the end of postgraduate training, the PG student should be able to;

1. Diagnose and appropriately manage common surgical ailments in a given situation.
2. Provide adequate preoperative, post-operative and follow-up care of surgical patients.
3. Identify situations calling for urgent or early surgical intervention and refer at the optimum time to the appropriate centers.
4. Counsel and guide patients and relatives regarding need, implications and problems of surgery in the individual patient.
5. Provide and coordinate emergency resuscitative measures in acute surgical situations including trauma.
6. Organize and conduct relief measures in situations of mass disaster including triage.
7. Effectively participate in the National Health Programs especially in the Family Welfare Programs.
8. Discharge effectively medico-legal and ethical responsibilities and practice his specialty ethically.
9. Must learn to minimize medical errors.
10. Must update knowledge in recent advances and newer techniques in the management of the patients.
11. Must learn to obtain informed consent prior to performance of operative procedure.
12. Perform surgical audit on a regular basis and maintain records (manual and/or electronic) for life.
13. Participate regularly in departmental academic activities by presenting Seminar, Case discussion, Journal Club and Topic discussion on weekly basis and maintain logbook.
14. Demonstrate sufficient understanding of basic sciences related to his specialty.
15. Plan and advise measures for the prevention and rehabilitation of patients belonging to his specialty.



**Research:**

The student should:

1. Know the basic concepts of research methodology, plan a research project and know how to consult library.
2. should have basic knowledge of statistics.

**Teaching:**

The student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students.

**Professionalism:**

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.

**IV. SUBJECT SPECIFIC COMPETENCIES:**

**By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:**

**A. Cognitive domain**

- Demonstrate knowledge of applied aspects of basic sciences like applied anatomy, physiology, biochemistry, pathology, microbiology and pharmacology.
- Demonstrate knowledge of the bedside procedures and latest diagnostics and therapeutics available.
- Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.
- Demonstrate the theoretical knowledge of general principles of surgery.
- Demonstrate the theoretical knowledge of systemic surgery including disaster management and recent advances.
- Demonstrate the theoretical knowledge to choose, and interpret appropriate diagnostic and therapeutic imaging including ultrasound, Mammogram, CT scan, MRI.
- Demonstrate the knowledge of ethics, medico-legal aspects, communication skills and leadership skills. The PG student should be able to provide professional services with empathy and humane approach.

## **B. Affective domain**

- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- Develop communication skills to word reports, obtain a proper relevant history and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.
- Obtain informed consent for any examination/procedure and explain to the patient and attendants the disease and its prognosis with a humane approach.
- Provide appropriate care that is ethical, compassionate, responsive and cost effective and in conformation with statutory rules.

## **C. Psychomotor domain**

- Perform a humane and thorough clinical examination including internal examinations and examinations of all organs/systems in adults and children
- Write a complete case record with all necessary details.
- Arrive at a logical working diagnosis / differential diagnosis after clinical examination.
- Order appropriate investigations keeping in mind their relevance (need based).
- Choose, perform and interpret appropriate imaging in trauma - ultrasound FAST (Focused Abdominal Sonography in Trauma).
- Perform minor operative procedures and common general surgical operations independently and the major procedures under guidance.
- Provide basic and advanced life saving support services in emergency situations
- Provide required immediate treatment and comprehensive treatment taking the help of specialist as required.
- Perform minimally invasive surgery in appropriate clinical settings. Must have undergone basic training in operative laparoscopy related to general and GI Surgery.
- Undertake complete patient monitoring including the preoperative and post operative care of the patient.
- Write a proper discharge summary with all relevant information.

## **V. SYLLABUS:**

### **Course Contents:**

No limit can be fixed and no fixed number of topics can be prescribed as course contents. She/he is expected to know the subject in depth, however, emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competence in surgical skills commensurate with the specialty (actual hands - on training) must be ensured.

### **1. General topics:**

A student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to his specialty. Further, the student should acquire in-depth knowledge of his subject including recent advances and should be fully conversant with the bedside procedures (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.

1. History of medicine with special reference to ancient Indian texts
2. Health economics - basic terms, health insurance
3. Medical sociology, doctor-patient relationship, family adjustments in disease, organizational behavior, conflict resolution
4. Computers - record keeping, computer aided learning, virtual reality, robotics
5. Hazards in hospital and protection:  
AIDS, hepatitis B, tuberculosis, radiation, psychological
6. Environment protection - bio-medical waste management
7. Surgical audit, evidence based surgical practice, quality assurance
8. Concept of essential drugs and rational use of drugs
9. Procurement of stores and material & personal management
10. Research methodology - library consultation, formulating research, selection of topic, writing thesis protocol, preparation of consent form from patients
11. Bio-medical statistics, clinical trials
12. Medical ethics
13. Consumer protection
14. Newer antibiotics
15. Problem of resistance.
16. Sepsis - SIRS
17. Nosocomial infection
18. Advances in imaging technologies
19. Disaster management, mass casualties, Triage
20. O.T. design, technologies, equipment

21. Critical care in surgical practice
22. Response to trauma
23. Wound healing
24. Fluid and electrolyte balance
25. Nutrition
26. Blood transfusion
27. Brain death
28. Cadaveric organ retrieval

## 2. Systemic Surgery

The student must acquire knowledge in the following important topics are but teaching should not be limited to these topics. A standard text-book may be followed, which will also identify the level of learning expected of the trainees.

- Wound healing including recent advances
- Asepsis, antisepsis, sterilization and universal precaution
- Surgical knots, sutures, drains, bandages and splints
- Surgical infections, causes of infections, prevention
- Common aerobic and anaerobic organisms and newer organisms causing infection including *Helicobacter Pylori*
- Tetanus, gas gangrene treatment & prevention
- Chronic specific infections TB, Filariasis
- Boils, cellulites, abscess, narcotizing fasciitis and synergistic infection
- Antibiotic therapy rationale including antibiotic prophylaxis, misuse, abuse
- Hospital acquired nosocomial infection causes and prevention including MRSA etc.
- HIV, AIDS and Hepatitis B & C, Universal precautions when dealing with patients suffering from these diseases
- Fluid and electrolyte balance including acid - base disturbance, consequences, Interpretation of blood gas analysis data and management
- Rhabdomyolysis and prevention of renal failure
- Shock (septicaemic, hypovolaemic, Neurogenic, anaphylactic), etiology, pathophysiology and management
- Blood and blood components, transfusion indication, contraindication, mismatch and prevention and management of complications of massive blood transfusion
- Common preoperative preparation (detailed preoperative workup, risk assessment according to the disease and general condition of the patient as per ASA grade) and detailed postoperative complications following major and minor surgical procedures

- Surgical aspects of diabetes mellitus particularly management of diabetic foot and gangrene, preoperative control of diabetes, consequences of hypo- and hyper- glycaemia in a postoperative setting
- Consequences and management of bites and stings including snake, dog, human bites
- Mechanisms and management of missile, blast and gunshot injuries
- Organ transplantation: Basic principles including cadaver donation, related Human Organ Transplant Acts, ethical and medicolegal aspects.
- Nutritional support to surgical patients
- Common skin and subcutaneous condition
- Sinus and fistulae, pressure sores
- Acute arterial occlusion, diagnosis and initiate management
- Types of gangrene, Burger's disease and atherosclerosis
- Investigations in case of arterial obstruction, amputation, vascular injuries: basic principles and management
- Venous disorders: Varicose veins
- Diagnosis, principles of therapy, prevention of DVT: basic principles and management
- Lymphatic: Diagnosis and principles of management of lymphangitis and lymphedema
- Surgical management of Filariasis
- Burns: causes, prevention and management
- Wounds of scalp and its management
- Recognition, diagnosis and monitoring of patients with head injury, Glasgow coma scale
- Undergo advanced trauma and cardiac support course (certified) before appearing in final examination
- Recognition of acute cerebral compression, indication for referrals.
- Cleft lip and palate
- Leukoplakia, retention cysts, ulcers of tongue
- Oral malignancies
- Salivary gland neoplasms
- Branchial cyst, cystic hygroma
- Cervical lymphadenitis nonspecific and tuberculous, metastatic lymph nodes and lymphomas.
- Diagnosis and principles of management of goitre
- Thyroglossal cyst and fistula
- Thyrotoxicosis
- Thyroid neoplasms
- Management of solitary thyroid nodule

- Thoracic outlet syndrome
- Management of nipple discharge
- Breast abscess
- Clinical breast examination, breast self examination
- Screening and investigation of breast lump
- Concept of Single Stop Breast Clinic
- Cancer breast diagnosis, staging and multimodality management (common neoadjuvant and adjuvant and palliative chemotherapy protocols and indications of radiation and hormonal therapy, pathology and interpretation of Tumour Markers, breast cancer support groups and counseling)
- Recognition and treatment of pneumothorax, haemothorax
- Pulmonary embolism: Index of suspicion, prevention/recognition and treatment
- Flail chest, stove in chest
- Postoperative pulmonary complication
- Empyema thoracis
- Recognition of oesophageal atresia and principles of management
- Neoplasms of the lung including its prevention by tobacco control
- Cancer oesophagus: principles of management including importance of early detection and timely referral to specialist
- Achalasia cardia
- Gastro-oesophageal reflux disease (GERD)
- Congenital hypertrophic pyloric stenosis
- Aetiopathogenesis, diagnosis and management of peptic ulcer including role of H. Pylori and its diagnosis and eradication
- Cancer stomach
- Signs and tests of liver dysfunction
- Amoebic liver abscess and its non-operative management
- Hydatid cyst and its medical and surgical management including laparoscopic management
- Portal hypertension, index of suspicion, symptoms and signs of liver failure and timely referral to a specialist center
- Obstructive jaundice with emphasis on differentiating medical vs surgical Jaundice, algorithm of investigation, diagnosis and surgical treatment options
- Neoplasms of liver
- Rupture spleen
- Indications for splenectomy
- Clinical features, diagnosis, complications and principles of management of cholelithiasis and cholecystitis including laparoscopic cholecystectomy

- Management of bile duct stones including endoscopic, open and laparoscopic management
- Carcinoma gall bladder, incidental cancer gallbladder, index of suspicion and its staging and principles of management
- Choledochal cyst
- Acute pancreatitis both due to gallstones and alcohol
- Chronic pancreatitis
- Carcinoma pancreas
- Peritonitis: causes, recognition, diagnosis, complications and principles of management with knowledge of typhoid perforation, tuberculous peritonitis, postoperative peritonitis
- Abdominal pain types and causes with emphasis on diagnosing early intra-abdominal acute pathology requiring surgical intervention
- Intestinal amoebiasis and other worms manifestation (Ascariasis) and their surgical complications (Intestinal Obstruction, perforation, gastrointestinal bleeding, involvement of biliary tract)
- Abdominal tuberculosis both peritoneal and intestinal
- Intestinal obstruction
- **Appendix:** Diagnosis and management of acute appendicitis
- Appendicular lump and abscess

### **Colon**

- Congenital disorders, Congenital mega colon
- Colitis infective / non infective
- Inflammatory bowel diseases
- Premalignant conditions of large bowel
- Ulcerative colitis
- Carcinoma colon
- Principles of management of types of colostomy

### **Rectum and Anal Canal:**

- Congenital disorders, Anorectal anomalies
- Prolapse of rectum
- Carcinoma rectum
- Anal Canal: surgical anatomy, features and management of fissures, fistula - in - ano.
- Perianal and ischiorectal abscess
- Haemorrhoids - Non-operative outpatient procedures for the control of bleeding (Banding, cryotherapy, injection) operative options - open and closed haemorrhoidectomy and stapled haemorrhoidectomy

- Anal carcinoma
- Clinical features, diagnosis, complication and principles of management of inguinal hernia including laparoscopic repair
- Umbilical, femoral hernia and epigastric hernia
- Open and Laparoscopic repair of incisional/primary ventral hernia
- Urinary symptoms and investigations of urinary tract
- Diagnosis and principles of management of urolithiasis
- Lower Urinary tract symptoms or prostatism
- Benign prostatic hyperplasia; diagnosis and management
- Genital tuberculosis in male
- Phimosi and paraphimosi
- Carcinoma penis
- Diagnosis and principles of treatment of undescended testis
- Torsion testis
- Hydrocele, haematocele and pyocele Varicocele: Diagnosis (Medical Board for fitness)
- Varicocele: Diagnosis (Medical Board for fitness)
- Acute and chronic epididymo-orchitis
- Testicular tumours
- Principles of management of urethral injuries
- Management of soft tissue sarcoma
- Prosthetic materials used in surgical practice
- Telemedicine, teleproctoring and e-learning
- Communication skills

## **VI. BIOSTATISTICS, RESEARCH METHODOLOGY & EPIDEMIOLOGY:**

1. Introduction to health research
2. Formulating research question
3. Literature review
4. Measures of disease frequency
5. Descriptive study designs
6. Analytical study designs
7. Experimental study designs: Clinical trials
8. Validity of epidemiological studies
9. Qualitative research methods: An overview
10. Measurement of study variables
11. Sampling methods
12. Calculating sample size and power
13. Selection of study population
14. Study plan and project management
15. Designing data collection tools
16. Principles of data collection
17. Data management
18. Overview of data analysis
19. Ethical framework for health research



20. Conducting clinical trials
21. Preparing a concept paper for research projects
22. Elements of a protocol for research studies
23. Publication Ethics

A student should be expert in good history taking, physical examination, providing basic life support and advanced cardiac life support, common procedures like FNAC, Biopsy, aspiration from serous cavities, lumbar puncture etc. The student should be able to choose the required investigations.

**Clinical cases and Symptoms-based approach to the patient with:**

1. Ulcers in oral cavity
2. Solitary nodule of the thyroid
3. Lymph node in the neck
4. Suspected breast lump
5. Benign breast disease
6. Acute abdominal pain
7. Blunt Trauma Abdomen
8. Gall stone disease
9. Dysphagia
10. Chronic abdominal pain
11. Epigastric mass
12. Right hypochondrium mass
13. Right iliac fossa mass
14. Renal mass
15. Inguino-scrotal swelling
16. Scrotal swelling
17. Gastric outlet obstruction
18. Upper gastrointestinal bleeding
19. Lower gastrointestinal bleeding
20. Anorectal symptoms
21. Acute intestinal obstruction
22. Obstructive jaundice
23. Acute retention of Urine
24. Bladder outlet obstruction
25. Haematuria
26. Peripheral vascular disease
27. Varicose veins
28. New born with developmental anomalies
29. Hydronephrosis , Pyonephrosis, perinephric abscess
30. Renal tuberculosis
31. Renal tumors
32. Carcinoma prostate
33. Genital tuberculosis in male

**At the end of the course, post graduate students should be able to perform independently (including perioperative management) the following;**

- Start IV lines and monitor infusions
- Start and monitor blood transfusion
- Venous cut-down
- Start and manage a C.V.P. line
- Conduct CPR (Cardiopulmonary resuscitation)
- Basic/ advance life support
- Endotracheal intubation
- Insert nasogastric tube
- Proctoscopy
- Urethral catheterisation
- Surgical management of wounds
- Biopsies including image guided
- Manage pneumothorax / pleural space collections
- Infiltration, surface and digital Nerve blocks
- Incise and drain superficial abscesses
- Control external hemorrhage
- Vasectomy (Preferably non-scalpel)
- Circumcision
- Surgery for hydrocele
- Surgery for hernia
- Surgery and Injection/banding of piles
- Management of all types of shock
- Assessment and management of burns
- Hemithyroidectomy
- Excision of thyroglossal cyst
- Excision Biopsy of Cervical Lymphnode
- Excision of benign breast lump
- Modified Radical mastectomy
- Axillary Lymphnode Biopsy
- Excision of gynaecomastia
- Excision of skin and subcutaneous swellings
- Split thickness skin graft
- Management of hernias
- Laparoscopic and open cholecystectomy
- Management of Liver abscess
- appendectomy
- Management of intestinal obstruction, small bowel resection, perforation and anastomosis
- Colostomy

**The student must have observed or assisted (the list is illustrative) in the following:**

- Hartmann's procedure for cancer rectum
- Splenectomy (emergency)
- Stomach perforation
- Varicose Vein surgery
- Craniotomy (Head Injury)
- Superficial parotidectomy
- Sub mandibular gland excision
- Soft tissue tumours including sarcoma
- Pancreaticoduodenal resection
- Hydatid cyst liver
- Pancreatic surgery
- Retroperitoneal operations

## **VII. TEACHING AND LEARNING METHODS**

### **Teaching methodology**

Didactic lectures are of least importance; small group discussion such as seminars, journal clubs, symposia, reviews and guest lectures should get priority for theoretical knowledge. Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning with appropriate emphasis on e-learning. Student should have hand-on training in performing various procedures and ability to interpret various tests/investigations. Exposure to newer specialized diagnostic/therapeutic procedures concerning her/his subject should be given. Self-learning tools like assignments and case-based learning may be promoted.

### **1. Clinical postings**

A major portion of posting should be in General Surgery. It should include in-patients, out-patients, ICU, trauma, emergency room and speciality clinics.

#### **Rotation of posting**

- Inter-unit rotation in the department should be done for a period of up to one year.
- Rotation in appropriate related subspecialties for a total period not exceeding 06 months.

### **2. Clinical meetings:**

There should be intra- and inter- departmental meetings for discussing the uncommon / interesting cases involving multiple departments.

**3. Log book:** Each student must be asked to present a specified number of cases for clinical discussion, perform procedures/tests/operations/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book. The Log books shall be checked and assessed periodically by the faculty members imparting the training.

**4. Thesis writing and research:**

Thesis writing is compulsory.

5. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.

6. A postgraduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

7. The student should know the basic concepts of research methodology, plan a research project, be able to retrieve information from the library. The student should have a basic knowledge of statistics.

8. Department should encourage e-learning activities.

**During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in the medical colleges is mandatory.**

**VIII. ASSESSMENT:**

Assessment should be comprehensive & objective. It should address the stated competencies of the course. The assessment needs to be spread over the duration of the course.

**A) FORMATIVE ASSESSMENT, i.e., assessment during the training would include: Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.**

**General Principles**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

**Quarterly assessment during the MS training should be based on following educational activities:**

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

**The student shall be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).**

**B) SUMMATIVE ASSESSMENT, ie., assessment at the end of training**

- The summative examination would be carried out as per the Postgraduate Medical Education Regulations, 2000 amended from time to time.
- The examination shall be conducted at the end of the third academic year.
- The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

**Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms).An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.

3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three examiners concerned.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

#### **IX. FORMAT OF THE EXAMINATION:**

Postgraduate examinations, in any subject shall consist of Thesis, Theory Papers, and Clinical/Practical and Oral examinations.

##### **1. Thesis:**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

##### *Guide*

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

##### *Co-guide*

- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides by the guide subject to approval by a Committee consisting of the Head of the Department and the Dean. There will be no restriction on the number of co-guides; as many eligible faculty who are postgraduate teachers as deemed appropriate may be permitted to act as co-guides.

### *Change of guide*

- In the event of a registered guide leaving the college for any reason or in the event of death, the guide, may be changed with prior permission from the Committee constituted by the Head of the Department and the Dean
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II) 6 months before the Theory and Clinical / Practical examination.
- Students who have not submitted the thesis within the stipulated time frame as notified by the University shall not be allowed to appear for the final examination.
- For MD/ MS Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

### **2. Theory:**

There shall be four theory papers, each of 3 hours duration. Out of these one shall be of Basic Medical Sciences and one shall be on recent advances.

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state. Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.
- Moderation of Question Papers :

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

Theory shall consist of four papers of 3 hours each.

**Paper I:** Basic Sciences

**Paper II:** Principles and Practice of Surgery

**Paper III:** Principles and practice of Operative Surgery

**Paper IV:** Recent Advances in Surgery & Biostatistics, Research Methodology, Epidemiology.

• **Distribution of Marks**

	<u>Duration</u>	<u>Marks</u>
Theory paper-1	3 hours	100
Theory paper-2	3 hours	100
Theory paper-3	3 hours	100
Theory paper-4	3 hours	100
Clinical / Practical		200
Viva-voce		100

**Theory examination duration: 3 Hours**

<b>Paper</b>	<b>Pattern and marks</b>	<b>Syllabus to be included</b>
Paper I	10 questions each carrying 10 marks. All the questions are to be answered. Total = 100 marks	<b>Basic Sciences in Surgery</b>
Paper II	10 question each carrying 10 marks. All the questions are to be answered. Total = 100 marks	Principles and Practice of Surgery
Paper III	10 questions each carrying 10 marks. All the questions are to be answered. Total = 100 marks	Principles and practice of Operative Surgery
Paper IV	10 questions, each carrying 10 marks (8 questions from recent advances in general surgery 2 questions from biostatistics, research methodology & epidemiology)  All the questions are to be answered. Total 100 marks	Recent Advances in Surgery & Biostatistics, Research Methodology, Epidemiology

**3. Clinical / Practical and viva voce Examination**



- Clinical examination shall be conducted to test the knowledge, skills, attitude and competence of the post graduate students for undertaking independent work as a specialist/Teacher, for which post graduate students shall examine a minimum one long case and two short cases.
- The Oral examination shall be thorough and shall aim at assessing the post graduate student's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.
- Assessment may include Objective structured clinical examination.(OSCE). Oral/Viva-voce examination needs to assess knowledge on X-rays, instrumentation, operative procedures. Due weight age should be given to Log Book Records and day- to-day observation during the training
- **Practical / Clinical & Viva Examination pattern:**

	Description	Marks
Long Cases* (one) Short cases (two)	-	100 marks 2 X 50 marks each = 100 marks
	Clinical / practical <b>Total marks</b>	= 200
Viva	Radiology (Radiographs, Ultrasonography, CT, MRI, etc.,)	25
	Operative procedures	25
	Instruments and specimens	25
	Recent advances and post operative management	25
	<b>Total marks</b>	100

- **Marking System for the Examination :**

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

• **Appointment of Examiners :**

1. All the Post Graduate Examiners shall be recognized Post Graduate Teachers holding recognized Post Graduate qualifications in the subject concerned.
2. No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
3. As per MCI, the Teachers in a medical college or institution having a total of 8 years teaching experience out of which at least 4 years teaching experience as Assistant Professor with at least one research publication in indexed journals gained after obtaining postgraduate degree shall be recognized as post graduate teacher in broad specialties.
4. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .
5. There shall be a panel of eight external examiners from outside the state as advised by the Head of the department. The Controller of Examinations shall have the powers to appoint two examiners from among the panel of examiners recommended by the HOD.

Total number of examiners required	-	Four
a. Internal Examiners	-	Two
b. External Examiners	-	Two

6. The Controller of Examinations shall have the powers to appoint two external examiners from among the panel of examiners recommended by the HOD.
7. If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
8. An examiner shall ordinarily be appointed for not more than two consecutive terms.
9. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

**X. RECOMMENDED READING:**

Books (latest edition)

1. *Text Book of Surgery*, by Christopher Davis

2. ASI Text Book of Surgery
3. *Surgery of Colon, Rectum and Anal canal*, by Goligher J C
4. *Schwartz Text Book of Surgery*
5. *Textbook on Laparoscopic Surgery*
6. *Trauma (Mattox)*
7. *Recent Advances in Surgery-irving taylor*
8. *Year Book of Surgery*
9. *Surgical Clinics of North America*
10. *Short practice of Surgery* by Bailey and Love
11. *A manual of clinical Surgery*, by S Das
12. Hamilton Bailey's demonstration of clinical signs
13. *Pye's Surgical Handicraft*
14. Text book of surgery - Sabiston
15. Operative surgery - Rob & Smith
16. Maingot's abdominal operative surgery

#### **BIOSTATICS, EPIDEMIOLOGY, RESEARCH METHODOLOGY**

- Rothman and Green land, Modern Epidemiology
- David Sachett, Epidemiology
- A.B. Hill, Medical Statistics

#### **Journals**

03-05 international Journals and 02 national (all indexed) journals

**Annexure I**

**Postgraduate Students Appraisal Form Pre / Para /Clinical Disciplines**

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis / Research work										
7.	Log Book Maintenance										

Publications Yes/ No

Remarks\*

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**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD



**PLAGIARISM**

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**  
**(A University established by an Act of A.P. State Legislature)**

**GUIDELINES FOR 'PLAGIARISM' CHECK**  
**WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D**  
**students**

**Ref.: Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for ThefRses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

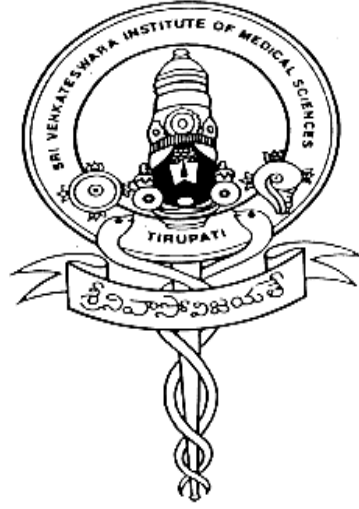
They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

####

SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
(A University established by an Act of Andhra Pradesh Legislature)

TIRUPATI - 517 507



COMMON FOR MD/ MS/ DM/ M.Ch. POSTGRADUATES

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

## PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :

*(Preferably be done by the faculty with whom the resident worked for most part of the period)*

### **Quality parameters being Assessed:**

1. Donor / Patient Evaluation
2. Academic Knowledge about Donor / Patient's Problems
3. Curiosity about unexplained Observations
4. Donor / Patient Care
5. Donor / Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

*Signature of the candidate*

*Signature of the guide*

*Signature of the HoD with seal*





3rd YEAR From..... To.....

MONTH	AREA OF POSTING	DEPARTMENT / UNIT

Total :

*Signature of Faculty.*

**Thesis Topic :**

**Guide :**

**Co-Guides :**

### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

### JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Journal Review Presentations:

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material, Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyze the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**CASES PRESENTED IN MORTALITY CONFERENCE**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LAB / INVASIVE PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>

**CONFERENCES ATTENDED**

<b>S. No.</b>	<b>Name</b>	<b>Role</b>	<b>Signature of supervising Faculty</b>

**PUBLICATIONS**

<b>S. No.</b>	<b>Topic</b>	<b>Journal</b>	<b>Role</b>

**BEDSIDE CASE DISCUSSION**

<b>S. No.</b>	<b>Date</b>	<b>Diagnosis</b>	<b>Signature of Faculty Presented to</b>

## SUMMARY OF LOG BOOK

*(To be filled at the end of the course & retained in this book)*

- Name of the student : Admn. No.
- Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_
- Name of the Institute:
- 1) No. of Journal Review Presentations : Presented ..... Attended .....
  - 2) No. of Seminar Presentations : Presented ..... Attended .....
  - 3) No. of Clinical Presentations : Presented ..... Attended .....
  - 4) No. of Case Presentations : Presented ..... Attended .....
  - 5) No. of UG Teaching Programmes : Conducted ..... Attended .....
  - (Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
  - 6) No. of PG Teaching Programmes : Attended
  - 7) No. of Investigative Procedures : Performed .....Assisted.....Observed...
  - 8) No. of Major Operations /  
Procedures /  
Experiments : Performed .....Assisted.....Observed...
  - 9) No. of Minor Operations /  
Procedures /  
Experiments : Performed .....Assisted.....Observed...
  - 10) No. of Emergencies : Performed .....Assisted.....Observed...
  - 11) No. of Medico-legal work : Performed .....Assisted.....Observed...
  - 12) No. of Public Health Visit /  
Social work /  
Survey /  
Immunization /  
Camps
  - 13) No. of Clinico-PathologicalConference : Presented ..... Attended.....
  - 14) No. of special investigation /  
Procedure : Conducted ..... Attended .....
  - 15) No. of events attended Conferences..... Symposia .....  
Workshops ..... CME .....
  - 16) Any other activities :

*Signature of the candidate*

*Signature of the guide*

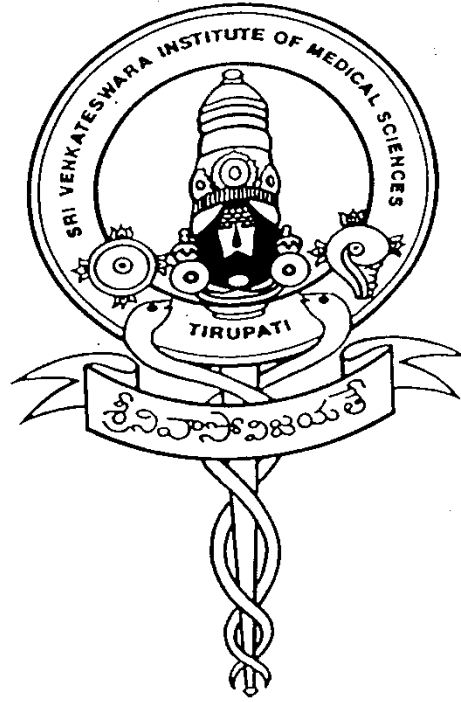
*Signature of the HoD with seal*

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**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES**

*(A University established by an act of A.P. State Legislature)*

**TIRUPATI – 517 507**



**M.D. - MEDICINE**

**COMMON BOARD OF STUDIES MEETING  
ON 22.07.2021**

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**TIRUMALA TIRUPATI DEVASTHANAMS**



**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES,  
TIRUAPATI**

**COMMON BOARD OF STUDIES MEETING HELD ON 22.07.2021**

**DOCTOR OF MEDICINE (MEDICINE)**

**INDEX**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**

**M.D (MEDICINE)**

**COMMON BOARD OF STUDIES MEETING ON 22.07.2021**

**List of Members:**

1. Dr B. Siddhartha Kumar - Chairman  
Dean, SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar, SVIMS, Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr YS Raju - External Expert  
Professor  
Department of General Medicine  
NIMS, Hyderabad  
Telangana
4. Dr Alladi Mohan - Internal Expert  
Professor (Senior Grade) & HoD  
Dept. of Medicine  
SVIMS, Tirupati.
6. Dr D.T. Katyarmal - Internal Expert  
Professor  
Dept. of Medicine  
SVIMS, Tirupati

**I. Regulations**

**Governing the Doctor of Medicine (Medicine) programme**

**1. Title of the programme**

The programme shall be called **Doctor of Medicine (Medicine)**

**2. Eligibility for admission**

A candidate who has passed final year M.B.B.S. examination after pursuing study in a medical college recognized by the Medical Council of India (MCI) and has completed one year compulsory rotating internship in a teaching Institution or other Institution recognized by the MCI, and has obtained permanent registration of any State Medical Council shall be eligible for admission.

**3. Duration of the programme**

The programme shall be a three full-academic year residency programme. As per current MCI regulations, the academic year begins on 1 May of each year.

**4. Syllabus**

The Board of Studies shall prepare and approve syllabus. Also it shall review the same periodically (Appendix II).

**5. Admission**

Admission to the MD (Medicine) course will be based on merit through PG-NEET/NEXT or other examinations conducted by NMC for the said academic year time to time

**6. Bond**

- i) The candidate shall execute a bond on a stamp paper (non-judicial) of Rs.100/- value along with two sureties undertaking that in the event of the candidate discontinuing the studies at any time during the course, he/she shall be bound to pay a sum of Rs. **5,00,000/- (Rupees Five Lakhs only)** along with the full stipend amount received by him/her back to the Institute.

- ii) The candidate shall also execute another bond that in the event of not working in the post and salary offered by the institute after successful completion of the course in the department (subject to availability of vacancy and requirement of the institute) for a period of one year towards compulsory service (Mandatory), after successful completion of the PG degree course in accordance with the G.O.RT.No.144, HM & FW (C1) Dept., dt.20.4.2018, of Govt. of AP. He/she shall be bound to pay a sum of Rs.20,00,000 (Rupees Twenty lakhs only).

## **7. Attendance**

All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

## **8. Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

## **9. District Residency Programme (No.MCI-18(1)/2020-Med./121415)**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as "**District Residency Programme (DRP)**" and the postgraduate medical student undergoing training shall be termed as a "**District Resident**".

## **9. Plagiarism**

While submitting the thesis, the plagiarism clearance report to be attached as per the regulations of SVIMS university (for detailed regulations see the Appendix III).

## **II. ASSESSMENT:**

**FORMATIVE ASSESSMENT**, during the training programme Formative assessment will be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

### **General Principles**

Internal Assessment will be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment will be conducted in theory and practical/clinical examination.

### **Quarterly assessment during the MD training will be based on:**

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

Internal assessment is done daily to assess the training and to identify the strengths and weaknesses of the postgraduate student.

- (a) Log Book (Appendix-I) with details of duration of postings, skills performed with remarks of the Teacher/Faculty member will be maintained and periodically updated by the postgraduate student.
- (b) Research work to be assessed and reviewed once in four months by the Chief-guide and the Head of the Department.

(c) Evaluation sheets for seminar and journal clubs with the following points for the purpose of assessment.

- (i) Choice of article/topic (unless specifically allotted).
- (ii) Completeness of presentation.
- (iii) Clarity and cogency of presentation.
- (iv) Understanding of the subject and ability to convey the same.
- (v) Whether relevant references have been consulted.
- (vi) Ability to convey points in favour and against the subject under discussion.
- (vii) Use of audio-visual aids.
- (viii) Ability to answer questions.
- (ix) Time scheduling.
- (x) Overall performance.

(d) The student will be assessed periodically as per categories listed in postgraduate student appraisal form (Appendix -I).

#### **B) SUMMATIVE ASSESSMENT, namely, assessment at the end of training**

- The summative examination would be carried out as per The Postgraduate Medical Education Regulations, 2000 as amended from time to time.
- The examinations shall be conducted at the end of the third academic year.
- The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

#### **Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension

of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.

2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three examiners concerned.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

### III. Format of the Examination:

Postgraduate examinations, in any subject shall consist of Thesis , Theory Papers, and Clinical/Practical and Oral examinations.

**1. Thesis:** Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

#### *Guide*

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

#### *Co-guide*

- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned.

#### *Change of guide*

- In the event of a registered guide leaving the college for any reason or in the event of death, the guide, may be changed with prior permission from the Committee constituted by the Head of the Department and the Dean.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.
- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II) six months before the Theory and Clinical / Practical examination.



- Students who have not submitted the thesis within the stipulated time frame shall not be allowed to appear for the final examination. Only those students whose theses have been approved by the panel of external examiners shall be eligible to appear for the final examination.
- For MD Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide cannot be nominated as examiners for evaluation of thesis.

## 2. Theory:

The examinations shall be organised on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four theory papers, each of 3 hours duration. As detailed below; Out of these one shall be of Basic Medical Sciences and one shall be on recent advances.;

**Paper I :** Basic Medical Sciences

**Paper II :** Medicine and allied specialties including dermatology & psychiatry

**Paper III:** Tropical Medicine and Infectious Diseases

**Paper IV:** Recent Advances in Medicine, Biostatistics, Biostatistics, Research Methodology and Epidemiology

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the Faculty in the concerned subject from outside the state of Andhra Pradesh, who shall be a recognized PG teacher as per NMC norms and who may or may not be involved in the clinical/practical examination. The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state

- **Moderation of Question Papers :**

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

- **3. Clinical/Practical & Oral Examination :**

- Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.
- The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

The final clinical examination will include:

- cases pertaining to major systems
- stations for clinical, procedural and communication skills
- Log Book Records and day-to-day observation during the training

### **Marking System for the Examination :**

1. The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examinations, shall be required for passing the examination.
2. Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be.
3. Distinction will be awarded only to the students who obtained 75% above in the aggregate marks in the very first attempt.

### **Appointment of Examiners :**

- All the Post Graduate Examiners shall be recognized Post Graduate Teachers holding recognized Post Graduate qualifications in the subject concerned.
- No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
- As per MCI, the Teachers in a medical college or institution having a total of 8 years teaching experience out of which at least 4 years teaching experience as Assistant Professor with at least one research publication in indexed journals gained after obtaining postgraduate degree shall be recognized as post graduate teacher in broad specialties.
- For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognized university, from outside the State .
- There shall be a panel of eight external examiners from outside the state as advised by the Head of the department.
- Total number of examiners required - Four  
Internal Examiners - Two  
External Examiners - Two

- The Controller of Examinations shall have the powers to appoint two external examiners from among the panel of examiners recommended by the HOD.
- If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
- An examiner shall ordinarily be appointed for not more than two consecutive terms.
- The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

### Scheme of examination

#### Distribution of Marks

	<u>Duration</u>	<u>Marks</u>
Theory paper-1	3 hours	100
Theory paper-2	3 hours	100
Theory paper-3	3 hours	100
Theory paper-4	3 hours	100
Clinicals / Practicals		200
<i>Viva-voce</i>		100
Total marks :		700

### IV. EXAMINATION PATTERN

#### Theory examination duration: 3 Hours

Paper	Pattern and marks	Syllabus to be included
Paper I	10 questions each carrying 10 marks. All the questions are to be answered.  Total = 100 marks	Basic Sciences in Medicine, Clinical Pharmacology, Genetics and Nutrition
Paper II	10 questions each carrying 10 marks. All the questions are to be answered.  Total = 100 marks	Medicine and allied specialties including Dermatology and Psychiatry.
Paper III	10 questions each carrying 10 marks. All the questions are to be answered.	Tropical Medicine and Infectious Diseases.

	Total = 100 marks	
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PaperIV	10 questions each carrying 10 marks. All the questions are to be answered.  Total = 100 marks	Recent advances in Medicine, Biostatistics, Research Methodology and Epidemiology
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### Practical / Clinical Examination :

Not more than 8 postgraduate students shall be examined per day in Clinical/Practical and *viva-voce*.

	Description	Marks
Long Cases*	-	100 marks
(one) Short cases (two)		2 X 50 marks each = 100 marks
	Clinicals / practicals <b>Total marks</b>	= 200
Viva	Radiology (Radiographs, Ultrasonography, CT, MRI, etc.,)	25
	ECG / Lab Investigations	25
	Therapeutics / Emergencies	25
	Recent advances	25
	<b>Total marks</b>	100

A structured three year training programme for MD (Medicine) arranged in the form of postings to different medical specialties for specified periods as outlined for duration of 36 months. *Postings of schedules may be modified depending on needs, feasibility and exigencies.*

(i) First Year Residency

- a) Out-patient and in-patient care
- b) Managing medical emergencies
- c) Learning diagnostic/ therapeutic procedures and interventions
- d) Interpreting Reports
- e) Writing up a thesis protocol, obtaining institutional ethical committee clearance, submitting the same and starting the thesis work
- g) Use of computers in medicine

(ii) Second Year Residency

- a) Out-patient and in-patient care
- b) Rotation (one year) in existing allied specialities such as Cardiology, Neurology, Endocrinology, Gastroenterology, Nephrology, Medical Oncology, Casualty and Medical Intensive Care Unit
- c) Conducting medical procedures independently
- d) Continuation of thesis work.
- e) District Residency Programme

(iii) Third Year Residency

- a) Out-patient and in-patient care
- b) Independent management of emergencies
- c) Teaching junior Residents / under-graduate students enrolled in the subject
- d) Analysis and submission of thesis

## V. READING MATERIAL

### (a) Text Books

#### MEDICINE

- Harrison's principles of internal medicine
- Oxford textbook of medicine
- Cecil's textbook of medicine
- API Textbook of medicine
- Hutchison's clinical methods
- Macleod's clinical methods
- Chamberlain's clinical methods
- Alagappan, Clinical methods
- Manual of Medical Therapeutics (Washington Manual)

#### NEUROLOGY

- Bickerstaff, Clinical methods in neurology
- Victor Adams, Neurology
- John Patten Localization in Neurology
- Paul Brazis, Localization in Neurology

- Dejong, Neurological examination

## **CARDIOLOGY**

- Braunwald, Cardiology
- Hurst, Cardiology
- Somaraju, Clinical methods in cardiology
- Jules Constant, Bedside cardiology
- Perloff, Congenital heart disease
- Goldberger, Electrocardiography

## **GASTROENTEROLOGY**

- Sheila Sherlock, Diseases of the liver and biliary system
- Schleisinger, diseases of the gastrointestinal system
- Tandon and Nundy, Tropical Gastroenterology

## **RESPIRATORY MEDICINE AND TUBERCULOSIS**

- Crofton Douglas, Diseases of the respiratory system
- Murray and Nadel, Respiratory diseases
- Fraser and Pare, Respiratory diseases
- JN Pande, Respiratory medicine in the tropics
- Richard Light, Pleural diseases
- Sharma and Mohan, Tuberculosis and nontuberculous mycobacterial diseases

## **TROPICAL MEDICINE**

- Manson Bahr, Tropical Medicine
- Reese, A practical Approach to Infectious Diseases

## **NEPHROLOGY**

- Brenner, Rector, Nephrology
- Oxford textbook of nephrology
- Oxford textbook of rheumatology
- Kelley's textbook of rheumatology

## **ENDOCRINOLOGY**

- William's Endocrinology

## **HAEMATOLOGY**

- Wintrobe's Haematology

## **GERIATRICS**

- Geriatric Medicine

## **BIOSTATISTICS, EPIDEMIOLOGY, RESEARCH METHODOLOGY**

- Rothman and Greenland, Modern Epidemiology
- David Sackett, Epidemiology
- A.B. Hill, Medical Statistics

## **MEDICAL ONCOLOGY**

- Devita, Principles and practice of Oncology

## **RECENT ADVANCES**

- MMS Ahuja, Progress in clinical medicine series (5 volumes)
- MMS Ahuja, Advances in clinical medicine
- Sharma and Mohan, Recent advances in respiratory medicine(all volumes in the series)

## **JOURNALS**

New England Journal of Medicine

The Lancet

JAMA

BMJ

Postgraduate Medical Journal

Annals of Internal Medicine

QJM

Clinical Infectious Diseases

Archives of Internal Medicine

Transactions of the Royal Society of Tropical Medicine and Hygiene

Medical Clinics of North America

European Respiratory Journal

Thorax

National Medical Journal of India

Indian Journal of Medical Research

J Assoc Physicians India

J Indian Med Assoc

J Indian Assoc Clinical Med

Indian Journal of Chest Diseases and Allied Sciences

American Journal of Respiratory and Critical Care Medicine

International Journal of Tuberculosis and Lung Diseases

Chest

## **MONOGRAPHS**

Medicine Update series (APICON)

Postgraduate Medicine series (APICON)

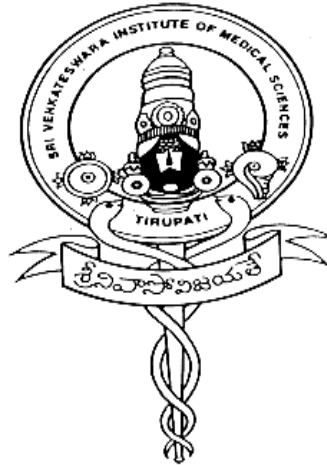
Monographs of the Indian College of Physicians (ICP)



**Appendix I**

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES, TIRUPATI**

(A University established by an Act of Andhra Pradesh Legislature)



**LOG BOOK FOR POSTGRADUATES  
MD/MS/DM/M.Ch.**

Name of the Candidate : .....

Subject / Course : .....

Date of Admission : .....Admn. No. ....

**PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES**

NAME OF THE POSTGRADUATE :

SUBJECT :

PERIOD OF ASSESSMENT :

DATE      MONTH      YEAR      TO      DATE      MONTH      YEAR  
                                  

POSTING DURING ABOVE PERIOD:

ASSESSMENT DONE BY :

(Should preferably be done by the faculty with whom the resident worked for most part of above period)

**QUALITY BEING ASSESSED**

1. Patient Evaluation
2. Academic Knowledge About Patients Problems
3. Curiosity about unexplained Observations
4. Patient Care
5. Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

PROFORMA SHOWN TO POSTGRADUATE CONCERNED :

SIGNATURE OF CONCERNED POSTGRADUATE :

CONCERNED FACULTY :

## **DETAILS OF POSTINGS OVER 3 YEARS**

### **1st YEAR**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

Total :

Signature of Faculty :

### **2nd YEAR**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

Total :

Signature of Faculty :

**3rd YEAR**

<b>MONTH</b>	<b>AREA OF POSTING</b>	<b>DEPARTMENT / UNIT</b>
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		

Signature of Faculty :

THESIS TOPIC : 1.

CHIEF GUIDE : 2.

CO-GUIDES : 3.














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## SUMMARY OF LOG BOOK

*(To be filled at the end of the course & retained in this book)*

- Name of the student : Admn. No.
- Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_
- Name of the Institute:
- 1) No. of Journal Review Presentations : Presented ..... Attended .....
  - 2) No. of Seminar Presentations : Presented ..... Attended .....
  - 3) No. of Clinical Presentations : Presented ..... Attended .....
  - 4) No. of Case Presentations : Presented ..... Attended .....
  - 5) No. of UG Teaching Programmes : Conducted ..... Attended .....
  - (Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
  - 6) No. of PG Teaching Programmes : Attended
  - 7) No. of Investigative Procedures : Performed .....Assisted.....Observed...
  - 8) No. of Major Operations / : Performed  
.....Assisted.....Observed...  
Procedures /  
Experiments
  - 9) No. of Minor Operations / : Performed  
.....Assisted.....Observed...  
Procedures /  
Experiments
  - 10) No. of Emergencies : Performed  
.....Assisted.....Observed...
  - 11) No. of Medico-legal work : Performed  
.....Assisted.....Observed...
  - 12) No. of Public Health Visit /  
Social work /  
Survey /  
Immunization /  
Camps
  - 13) No. of Clinico-PathologicalConference : Presented ..... Attended.....
  - 14) No. of special investigation / : Conducted ..... Attended .....
  - Procedure
  - 15) No. of events attended Conferences..... Symposia .....
  - Workshops ..... CME .....
  - 16) Any other activities :
- Signature of the candidate* *Signature of the HoD with seal*

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## Postgraduate Students Appraisal Form

### Pre / Para /Clinical Disciplines

\*\*\*

Name of the Department/Unit :  
 Name of the PG Student :  
 Period of Training : FROM.....TO.....

Sl. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based/recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis/Research work										
7.	Log Book Maintenance										

**Publications**

**Yes/No**

**Remarks\***

\_\_\_\_\_

**\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

**SIGN.OF ASSESSEE**

**SIGN.OF HOD**

**SYLLABUS**

**Appendix II**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The competency based training programme aims to produce a post-graduate student who after undergoing the required training should be able to deal effectively with the needs of the community and should be competent to handle all problems related to his/her specialty including recent advances. The student should also acquire skill in teaching of medical/para-medical students in the subject that he/she has received his/her training. He She should be aware of his/her limitations. The student is also expected to know the principles of research methodology and modes of accessing literature.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the pndurpcoosnetenat. This has necessitated retention of "domains of learning" under the heading "competencies".

### ***SUBJECT SPECIFIC OBJECTIVES***

The postgraduate training should enable the student to:

1. Practice efficiently internal medicine specialty, backed by scientific knowledge including basic sciences and skills
2. Diagnose and manage majority of conditions in his specialty (clinically and with the help of relevant investigations
3. Exercise empathy and a caring attitude and maintain professional integrity, honesty and high ethical standards
4. Plan and deliver comprehensive treatment using the principles of rational drug therapy
5. Plan and advise measures for the prevention and rehabilitation of patients belonging to his specialty;
6. Manage emergencies efficiently by providing Basic Life Support (BLS) and Advanced Life Support (ALS) in emergency situations
7. Recognize conditions that may be outside the area of the specialty/ competence and refer them to an appropriate specialist
8. Demonstrate skills in documentation of case details including epidemiological data

9. Play the assigned role in the implementation of National Health Programs
10. Demonstrate competence in basic concepts of research methodology and clinical epidemiology; and preventive aspects of various disease states
11. Be a motivated 'teacher' - defined as one keen to share knowledge and skills with a colleague or a junior or any learner
12. Continue to evince keen interest in continuing education irrespective of whether he/she is in a teaching institution or is practicing and use appropriate learning resources
13. Be well versed with his medico-legal responsibilities
14. Undertake audit, use information technology tools and carry out research - both basic and clinical, with the aim of publishing the work and presenting the work at scientific forums.
15. The student should be able to recognize the mental condition characterized by self absorption and reduced ability to respond to the outside world (e.g. Autism), abnormal functioning in social interaction with or without repetitive behaviour and/or poor communications, etc.

The intended outcome of a competency based program is a consultant specialist who can practice medicine at a defined level of competency in different practice settings. i.e., ambulatory (outpatient), inpatient, intensive care and emergency medicine. No limit can be fixed and no fixed number of topics can be prescribed as course contents. The student is expected to know his subject in depth; however, emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competence in skills commensurate with the specialty (actual hands-on training) must be ensured.

#### ***SUBJECT SPECIFIC COMPETENCIES***

<b>Course code</b>	<b>Name of the Course</b>
IM101	Basic Medical Sciences
IM102	Medicine and Allied Specialities including Dermatology & Psychiatry
IM103	Tropical Medicine and Infectious Diseases
IM104	Recent advances in Medicine
IM105	Practical / Clinical and Viva voce

IM106	Thesis / Research work
IM107	Soft Skills, Attitude, Ethics and Communication

## COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD GENERAL MEDICINE

### Aims of the program: PROGRAM OBJECTIVES:

<b>Program outcomes</b>
<b>A post graduate student upon successfully qualifying in the MD GENERAL MEDICINE examination will be able to:</b>
<ul style="list-style-type: none"> <li>• Practice efficiently internal medicine specialty, backed by scientific knowledge including basic sciences and skills</li> <li>• Diagnose and manage majority of conditions in his specialty (clinically and with the help of relevant investigations)</li> <li>• Exercise empathy and a caring attitude and maintain professional integrity, honesty and high ethical standards</li> <li>• Plan and deliver comprehensive treatment using the principles of rational drug therapy</li> <li>• Plan and advise measures for the prevention and rehabilitation of patients belonging to his specialty;</li> <li>• Manage emergencies efficiently by providing Basic Life Support (BLS) and Advanced Life Support (ALS) in emergency situations</li> <li>• Recognize conditions that may be outside the area of the specialty/ competence and refer them to an appropriate specialist</li> <li>• Demonstrate skills in documentation of case details including epidemiological data</li> <li>• Play the assigned role in the implementation of National Health Programs</li> <li>• Demonstrate competence in basic concepts of research methodology and clinical epidemiology; and preventive aspects of various disease states</li> <li>• Be a motivated 'teacher' - defined as one keen to share knowledge and skills with a colleague or a junior or any learner</li> <li>• Continue to evince keen interest in continuing education irrespective of whether he/she is in a teaching institution or is practicing and use appropriate learning resources</li> <li>• Be well versed with his medico-legal responsibilities</li> <li>• Undertake audit, use information technology tools and carry out research - both basic and clinical, with the aim of publishing the work and presenting the work at scientific forums.</li> </ul>

- The student will be able to recognize the mental condition characterized by self absorption and reduced ability to respond to the outside world (e.g. Autism), abnormal functioning in social interaction with or without repetitive behaviour and/or poor communications, etc.

## COURSE CONTENT - KNOWLEDGE AND SKILLS

<b>Course Outcomes</b>	
<b>Competencies - A. Cognitive Domain</b>	<b>Competency Mapping Course Code</b>
<b>Basic Sciences</b>	
1. Basics of human anatomy as relevant to clinical practice e.g. surface anatomy of various viscera, neuro-anatomy, important structures/organs location in different anatomical locations in the body; common congenital anomalies	IM101
2. Basic functioning of various organ-system, control of vital functions, patho-physiological alteration in diseased states, interpretation of symptoms and signs in relation to patho-physiology	IM101, IM102
3. Common pathological changes in various organs associated with diseases and their correlation with clinical signs; understanding various pathogenic processes and possible therapeutic interventions possible at various levels to reverse or arrest the progress of diseases.	IM101 IM102
4. Knowledge about various microorganisms, their special characteristics important for their pathogenetic potential or of diagnostic help; important organisms associated with tropical diseases, their growth pattern/life-cycles, levels of therapeutic interventions possible in preventing and/or eradicating the organisms	IM101 IM103
5. Knowledge about pharmacokinetics and pharmaco-dynamics of the drugs used for the management of common problems in a normal person and in patients with diseases kidneys/liver etc. which may need alteration in metabolism/excretion of the drugs; rational use of available drugs	IM101 IM102
6. Knowledge about various poisons with specific reference to different geographical and clinical settings, diagnosis and management.	IM102
7. Research Methodology and Studies, epidemiology and basic Biostatistics	IM101
8. National Health Programmes.	IM102



9. Biochemical basis of various diseases including fluid and electrolyte disorders; Acid base disorders etc.	IM101 IM102
10. Recent advances in relevant basic science subjects	IM101 IM104
<b>Systemic Medicine</b>	
1. Preventive and environmental issues, including principles of preventive health care, immunization and occupational, environmental medicine and bio-terrorism.	IM103
2. Aging and Geriatric Medicine including Biology, epidemiology and neuro-psychiatric aspects of aging	IM101
3. Clinical Pharmacology - principles of drug therapy, biology of addiction and complementary and alternative medicine	IM101
4. Genetics - overview of the paradigm of genetic contribution to health and disease, principles of Human Genetics, single gene and chromosomal disorders and gene therapy.	IM101
5. Immunology - The innate and adaptive immune systems, mechanisms of immune mediated cell injury and transplantation immunology.	IM101
6. Cardio-vascular diseases - Approach to the patient with possible cardio-vascular diseases, heart failure, arrhythmias, hypertension, coronary artery disease, valvular heart disease, infective endocarditis, diseases of the myocardium and pericardium and diseases of the aorta and peripheral vascular system	IM102, IM101
7. Respiratory system - approach to the patient with respiratory disease, disorders of ventilation, asthma, Congenital Obstructive Pulmonary Disease (COPD), Pneumonia, pulmonary embolism, cystic fibrosis, obstructive sleep apnoea syndrome and diseases of the chest wall, pleura and mediastinum	IM102, IM101

8. Nephrology - approach to the patient with renal diseases, acid-base disorders, acute kidney injury, chronic kidney disease, tubulo-interstitial diseases, nephrolithiasis, Diabetes and the kidney, obstructive uropathy and treatment of irreversible renal failure	IM102, IM101
9. Gastro-intestinal diseases - approach to the patient with gastrointestinal diseases, gastrointestinal endoscopy, motility disorders, diseases of the oesophagus, acid peptic disease, functional gastrointestinal disorders, diarrhea, irritable bowel syndrome, pancreatitis and diseases of the rectum and anus.	IM102, IM101
10. Diseases of the liver and gall bladder - approach to the patient with liver disease, acute viral hepatitis, chronic hepatitis, alcoholic and non-alcoholic steatohepatitis, cirrhosis and its sequelae, hepatic failure and liver transplantation and diseases of the gall bladder and bile ducts	IM102, IM101
11. Haematologic diseases - haematopoiesis, anaemias, leucopenia and leucocytosis, myelo-proliferative disorders, disorders of haemostasis and haemopoietic stem cell transplantation	IM102, IM101
12. Oncology - epidemiology, biology and genetics of cancer, paraneoplastic syndromes and endocrine manifestations of tumours, leukemias and lymphomas, cancers of various organ systems and cancer chemotherapy	IM102, IM101
13. Metabolic diseases - inborn errors of metabolism and disorders of metabolism.	IM102, IM101
14. Nutritional diseases - nutritional assessment, enteral and parenteral nutrition, obesity and eating disorders.	IM102, IM101
15. Endocrine - principles of endocrinology, diseases of various endocrine organs including diabetes mellitus	IM102, IM101
16. Rheumatic diseases - approach to the patient with rheumatic diseases, osteoarthritis, rheumatoid arthritis, spondyloarthropathies, systemic lupus erythematosus (SLE), polymyalgia, rheumatic fibromyalgia and amyloidosis	IM102, IM101
17. Infectious diseases - Basic consideration in Infectious Diseases, clinical syndromes, community acquired clinical syndromes. Nosocomial infections, Bacterial diseases - General consideration, diseases caused by gram - positive bacteria, diseases caused by gram - negative bacteria, miscellaneous bacterial infections, Mycobacterial diseases, Spirochetal diseases, Rickettsia, Mycoplasma and Chlamydia, viral	IM103, IM101

diseases, DNA viruses, DNA and RNA respiratory viruses, RNA viruses, fungal infections, protozoal and helminthic infections	
18. Neurology - approach to the patient with neurologic disease, headache, seizure disorders and epilepsy, coma, disorders of sleep, cerebrovascular diseases, Parkinson's disease and other movement disorders, motor neuron disease, meningitis and encephalitis, peripheral neuropathies, muscle diseases, diseases of neuromuscular transmission and autonomic disorders and their management	IM102, IM101
19. The mental condition characterized by complete self absorption with reduced ability to communicate with the outside world (Autism), abnormal functioning in social interaction with or without repetitive behaviour and/or poor communication etc.	IM102, IM101
20. Dermatology - Structure and functions of skin, infections of skin, papulo-squamous and inflammatory skin rashes, photo-dermatology, erythroderma, cutaneous manifestations of systematic diseases, bullous diseases, drug induced rashes, disorders of hair and nails, principles of topical therapy.	IM102, IM101
<b>B. Affective Domain:</b>	
<ol style="list-style-type: none"> <li>1. Will be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.</li> <li>2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.</li> <li>3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching</li> </ol>	IM107
<b>B. Psychomotor domain</b>	
<b>1. Clinical Assessment Skills</b>	
<ul style="list-style-type: none"> <li>• Elicit a detailed clinical history</li> <li>• Perform a thorough physical examination of all the systems</li> </ul>	IM105

<b>2. Procedural skills</b>	
-----------------------------	--

<ul style="list-style-type: none"> <li>• Test dose administration</li> <li>• Mantoux test</li> <li>• Sampling of fluid for culture</li> <li>• IV- Infusions</li> <li>• Intravenous injections</li> <li>• Intravenous canulation</li> <li>• ECG recording</li> <li>• Pleural tap</li> <li>• Lumbar puncture</li> <li>• Cardiac <ul style="list-style-type: none"> <li>▪ TMT</li> <li>▪ Holter Monitoring</li> <li>▪ Echocardiogram</li> <li>▪ Doppler studies</li> </ul> </li> <li>• Cardio Pulmonary Resuscitation (CPR)</li> <li>• Central venous line insertion, CVP monitoring</li> <li>• Blood and blood components matching and transfusions</li> <li>• Arterial puncture for ABG</li> <li>• Fine needle aspiration cytology (FNAC) from palpable lumps</li> <li>• Bone marrow aspiration and biopsy</li> <li>• Abdominal paracentesis - diagnostic</li> <li>• Aspiration of liver abscess</li> <li>• Pericardiocentesis</li> <li>• Joint fluid aspiration</li> <li>• Liver biopsy</li> <li>• Nerve/ muscle/ skin/ kidney/ pleural biopsy</li> <li>• Ultrasound abdomen, echocardiography</li> <li>• Upper GI endoscopy, procto-sigmoidoscopy</li> </ul>	IM105
<p><b>Respiratory management</b></p> <ul style="list-style-type: none"> <li>• Nebulization</li> <li>• Inhaler therapy</li> <li>• Oxygen delivery</li> </ul>	IM105
<p><b>Critically ill person</b></p> <ul style="list-style-type: none"> <li>• Monitoring a sick person</li> <li>• Endotracheal intubation</li> <li>• CPR</li> <li>• Using a defibrillator</li> </ul>	IM105

<ul style="list-style-type: none"> <li>• Pulse oximetry</li> <li>• Feeding tube/Ryle's tube, stomach wash</li> </ul> <p>Naso-gastric intubation</p> <ul style="list-style-type: none"> <li>• Urinary catheterization - male and female</li> <li>• Prognostication</li> <li>• Haemodialysis</li> </ul>	
<p><b>Neurology- interpret</b></p> <p><b>Nerve conduction studies EEG</b></p> <ul style="list-style-type: none"> <li>• Evolved Potential interpretation</li> <li>• Certification of Brain death</li> </ul> <p>Intercostal tube placement with underwater seal Thoracocentesis</p> <ul style="list-style-type: none"> <li>• Sedation</li> <li>• Analgesia</li> </ul>	IM105
<p><b>Laboratory-Diagnostic Abilities</b></p> <ul style="list-style-type: none"> <li>• Urine protein, sugar, microscopy</li> <li>• Peripheral blood smear</li> <li>• Malarial smear</li> <li>• Ziehl Nielson smear-sputum, gastric aspirate</li> <li>• Gram's stain smear-CSF, pus</li> <li>• Stool pH, occult blood, microscopy</li> <li>• KOH smear</li> <li>• Cell count - CSF, pleural, peritoneal, any serous fluid</li> </ul>	IM105
<p><b>Observes the procedure</b></p> <ul style="list-style-type: none"> <li>• Subdural, ventricular tap</li> <li>• Joint Aspiration - Injection</li> </ul> <p><b>Endoscopic Retrograde Cholangio- Pancreatography (ERCP)</b></p> <ul style="list-style-type: none"> <li>• Peritoneal dialysis</li> </ul>	IM105
<p><b>3. Interpretation Skills</b></p>	
<p>Clinical data (history and examination findings), formulating a differential diagnosis in order of priority, using principles of clinical decision making, plan investigative work-up, keeping in mind the cost-effective approach i.e. problem solving and clinical decision-making.</p> <ul style="list-style-type: none"> <li>• Blood, urine, CSF and fluid investigations - hematology, biochemistry</li> <li>• X-ray chest, abdomen, bone and joints</li> </ul>	IM105

<ul style="list-style-type: none"> <li>• ECG</li> <li>• Treadmill testing</li> <li>• ABG analysis</li> <li>• Ultrasonography</li> <li>• CT scan chest and abdomen</li> <li>• CT scan head and spine</li> <li>• MRI</li> <li>• Barium studies</li> <li>• IVP, VUR studies</li> <li>• Pulmonary function tests</li> <li>• Immunological investigations</li> <li>• Echocardiographic studies</li> </ul>	
<p><b>Interpretation under supervision</b> Hemodynamic monitoring</p> <ul style="list-style-type: none"> <li>• Nuclear isotope scanning</li> <li>• MRI spectroscopy/SPECT</li> <li>• Ultrasound guided aspiration and biopsies</li> </ul>	IM105
<p><b>4. Communication skills</b></p>	
<ul style="list-style-type: none"> <li>• While eliciting clinical history and performing physical examination Communicating health, and disease</li> <li>• Communicating about a seriously ill or mentally abnormal communicating death informed consent</li> <li>• Empathy with patient and family members</li> <li>• Referral letters, and replies</li> <li>• Discharge summaries</li> <li>• Death certificates</li> <li>• Pre-test counseling for HIV</li> <li>• Post-test counseling for HIV</li> <li>• Pedagogy - teaching students, other health functionaries lectures, besides clinics, discussions</li> <li>• Health education - prevention of common medical problems, promoting healthy life-style, immunization, periodic health screening, counseling skills in risk factors for common malignancies, cardiovascular disease, AIDS</li> <li>• Dietary counselling in health and disease</li> <li>• Case presentation skills including recording case history / examination, preparing follow-up notes, preparing referral notes, oral presentation of new cases / follow-up cases</li> </ul>	IM107

<ul style="list-style-type: none"> <li>• Co -coordinating care – team work (with house staff, nurses, faculty etc.)</li> <li>• Linking patients with community resources</li> <li>• Providing referral</li> <li>• Genetic counselling</li> </ul>	
<b>5. Others</b>	
<p>Demonstrating</p> <ul style="list-style-type: none"> <li>- professionalism</li> <li>- ethical behavior (humane and professional care to patients)</li> </ul> <p>Utilization of information technology</p> <ul style="list-style-type: none"> <li>- Medicine search, Internet access, computer usage Research methodology</li> <li>- Designing a study</li> <li>- Interpretation and presentation of scientific data</li> </ul> <p>Self-directed learning</p> <ul style="list-style-type: none"> <li>- identifying key information sources</li> <li>- literature searches</li> <li>- information management</li> </ul> <p>Therapeutic decision-making</p> <ul style="list-style-type: none"> <li>- managing multiple problems simultaneously</li> <li>- assessing risks, benefits and costs of treatment options</li> <li>- involving patients in decision-making</li> <li>- selecting specific drugs within classes</li> <li>- Rational use of drugs</li> </ul>	IM107

**PLAGIARISM GUIDELINES**  
**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**  
**(A University established by an Act of A.P. State Legislature)**

**GUIDELINES FOR 'PLAGIARISM' CHECK**  
**WHILE SUBMISSION OF THESIS/DISSERTATION BY DM/M.Ch/MD/MS/Ph.D**  
**students**

**Ref.:Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for ThefRses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report .
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/ dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/ dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/ dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/ dissertation at the time of submission to the Controller of Examinations.

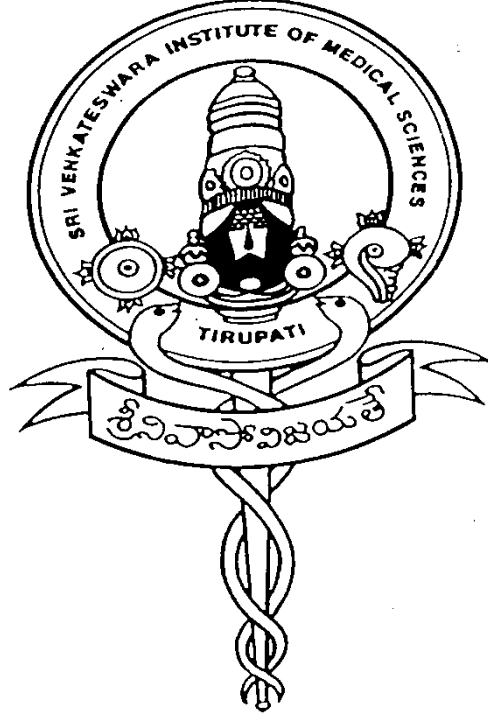
All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.



# **SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES**

*(A University established by an act of Andhra Pradesh State Legislature)*

**TIRUPATI – 517 507**



**M.D. RADIO DIAGNOSIS COURSE**

**COMMON BOARD OF STUDIES MEETING**

**ON 22.07.2021**

**TIRUMALA TIRUPATI DEVASTHANAMS**

**SRI VENKATESWARA INSTITUTE OF MEDICAL  
SCIENCES, TIRUPATI**

**M.D. RADIO DIAGNOSIS COURSE**

**COMMON BOARD OF STUDIES MEETING HELD ON 22.07.2021**

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**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES::TIRUPATI**

**M.D. (RADIO-DIAGNOSIS)**

**COMMON BOARD OF STUDIES MEETING ON 22.07.2021**

**List of Members:**

1. Dr B. Siddhartha Kumar - Chairman  
Dean,  
SVIMS, Tirupati.
2. Dr K.V. Sreedhar Babu - Member  
Registrar,  
SVIMS, Tirupati.
3. Dr V. Suresh - Member  
Controller of Examinations,  
SVIMS, Tirupati.
4. Dr. Y.Jyotsna Rani, - External expert  
Professor & HoD  
Nizam's Institute of Medical Sciences,  
Hyderabad  
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Email ID: jyotsna@yahoo.com
5. Dr B. Vijaya Lakshmidēvi - Internal expert  
Professor & HoD i/c  
Dept. of Radiology  
SVIMS, Tirupati.
6. Dr S. Sarala - Internal expert  
Professor  
Dept. of Radiology  
SVIMS, Tirupati

# **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR M.D., IN RADIO-DIAGNOSIS**

## **(As prescribed by MCI, 2018)**

### **Preamble:**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. The Goal of this program is to impart training in conventional and modern radiology and imaging techniques so that the post graduate student becomes well versed and competent to practice, teach and conduct research in the discipline of radiology. The student should also acquire basic knowledge in the various sub-specialities of radiology. These Guidelines also would also help to standardize Radiodiagnosis teaching at post graduate diploma (DMRD) level throughout the country so that it will benefit in achieving competent radiologist with appropriate expertise. The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

### **I. AIMS & OBJECTIVES**

#### **General:**

The aim of the training is to enable the trainee capable of practicing independently as a competent Clinical Radiologist. The trainee should be compassionate and ethical in their practice of Radio diagnosis and would also contribute to the future developments in Radio diagnosis.

- Three broad domains of the objectives are:
- Cognitive domain (Knowledge)
- Psychomotor domain (Skills)
- Attitudinal domain (Human values, ethical practice etc.)

#### ***Cognitive Domain (Knowledge)***

- Describe aetiology, pathophysiology, and principles of diagnosis and management of common problems including emergencies, in adults and children.
- Demonstrate understanding of basic sciences relevant to this specialty.
- Identify important determinants in a case (eg. Social, economic, environmental) and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of specialty / competence and to refer them to proper specialist or ask for help.
- Advise regarding the management (including interventional radiology) of the case and to carry out the management effectively.
- Update oneself by self-study and by attending courses, seminars, conferences and workshop which are relevant to the field of Radio-Diagnosis.
- Carry out guided research with the aim of publishing his/ her work and presenting work at various scientific fora.
  
- *Psychomotor Domain (Skills)*
- Take a proper clinical history, examine the patient, perform essential diagnostic/ interventional procedures and interpret the results to come to a reasonable diagnosis or differential diagnosis in the condition.
- Provide basic life saving support service in emergency situations
- Undertake complete patient monitoring including the care of the patient
  
- *Attitudinal Domain*
- Adopt ethical principles in all aspects of his/ her practice. Professional honesty and integrity to be fostered.
- Develop communication skills in order to explain the various options available in management and to obtain a true informed consent from the patient.
- Be humble and accept the limitations of his knowledge and skills and to ask for help from colleagues / seniors when needed.
- Respect patient rights and privileges including patient's right to information and right to seek a second opinion.
- *Specific:*
  - The induction programme is intended to give the new trainees a general idea about SVIMS, the nature of work done in various departments and the location of various departments within SVIMS. The HoD will introduce and guide the new students to various facilities listed below.
  
- Conventional Radiography and Special investigations.
- Ultra sound and Doppler.
- Ultra sound guided procedures.
- CT Scanning, Angiography reconstructions, CT guided procedures.
- M.R.I.
- Mammography
- Digital subtraction angiography

## II. REGULATIONS

- **Title of the programme :** The programme shall be called M.D (RADIO DIAGNOSIS)
- **Eligibility of admission :**
  - A candidate seeking admission into the course shall have MCI recognized M.B.B.S Qualification.
- **Duration of the Course :**
  - The duration of the course shall be three academic years including the period of examination
- **Syllabus :**
  - The Board of studies shall prepare and approve syllabus. Also it shall review the same periodically.
- **Admission:**
  - Based on an entrance examination(NEET-PG) to be conducted as per NMC/MCI norms.
- **Bond :**
  - After successful completion of the course, the candidate shall work as a Senior Resident or suitable post offered by the institute subject to availability of the vacancy and requirement of the institute as per the bond executed by the student.
- **Training Programme :**
  - The candidate joining the course must work as full time Resident during the period of Post Graduate Training.
  - To attend two CMEs - 1<sup>st</sup> year
  - To attend one Conference & one CME - 2<sup>nd</sup> year
  - To attend one conference & one CME - 3<sup>rd</sup> year
- **Research Methodology**

The postgraduate student(s) shall complete an online course in Research Methods being conducted by an Institute(s) that may be designated by the Medical Council of India by way of public notice, including on its website and by Circular to all Medical Colleges. The students shall have to register on the portal of the designated institution or any other institute as indicated in the public notice. The student(s) have to complete the course by the end of their 2nd

semester. The online certificate generated on successful completion of the course and examination thereafter, will be taken as proof of completion of this course. The successful completion of the online research methods course with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. This requirement will be applicable for all postgraduate students admitted from the academic year 2019-20 onwards.

- **Procedure for Discontinuation :**

After closure of the admissions, the student will not be permitted to discontinue studies, unless he/she fulfils the bond executed by him/her.

- **Attendance requirement for Admission to Examination:**

All the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of six months including assignments, assessed full time responsibilities and participation in all facets of the educational process.

- **District Residency Programme (No.MCI-18(1)/2020-Med./121415):**

The Post-Graduate student (s) shall undergo a compulsory Residential Rotation of 03 (Three) months in District Hospitals / District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme. This rotation shall be termed as "**District Residency Programme (DRP)**" and the postgraduate medical student undergoing training shall be termed as a "**District Resident**".

- **Plagiarism**

While submitting the thesis, the plagiarism clearance report to be attached as per the regulations of SVIMS university (for detailed regulations see the Annexure-II).

- **Teaching/Learning Methods :**

- Learning in MD (Radio diagnosis ) course shall essentially be under guidance.

- **Group teaching sessions:**

- Journal review
- Subject seminar presentation
- Group discussion
- Clinical case presentations pertaining Radio diagnosis/case presentation in interdepartmental sessions
- Participation in CME programmes and conferences

- Tumour board participation

### **Posting Schedule**

- **I year**

- Dark room techniques, plain radiography & special investigations- 04 months
- Ultra sonography - 02 months
- Doppler - 02 months
- CT - 02 months
- MRI - 01 month
- Other departmental posting 01 month ( nuclear medicine)

- **II year**

- Conventional Radiology & special investigations 01 months
- Ultra sonography - 02 months
- Doppler - 02 months
- CT - 02 months
- MRI - 02 months
- District residency programme- 3 months

- **III year**

- Conventional Radiology & Special Investigations - 02 months
- Internal peripheral posting ( DSA) - 01 month
- Ultra sound - 02 months
- Doppler - 02 months
- CT - 03 months
- MRI - 02 months

- **Maintenance of Log Book :**

- Each candidate should maintain a log book in which the following details will be entered. The log book shall be verified and signed by the concerned posting faculty once in a month as per the NMC/MCI norms.

- Presentation in departmental seminars.
- Cases presented in clinical meetings.
- Presentations in journal clubs along with Title, Journal and Issue
- Schedule of intradepartmental rotation
- Details of peripheral postings
- To attend Conferences/CME (Radiology related subjects) - To allot 50 credit hours. For poster/ paper presentation-Doubling of credit hours.
- Papers presented at conferences with title name of the conference, date of presentation



- Paper published with title, name and issue of the journal.
- *Maintenance of log book and verification at the end of posting by modality incharge is mandatory.*

#### Teaching Schedule :

- Journal club once in a week 8 am to 9 am
- Seminar once in a week 8 am to 9am
- Neuro meet once in a week 8 am to 9 am
- Uro meet once in a week 8 am to 9 am
- Tumour board once in a week 8 am to 9 am
- Case presentation once in a week 3 to 4 pm
- Research forum once in a week 8 am to 9 am
- Gastro meet once in Fortnight
- Chest meet once in Fortnight
- Endo meet once in Fortnight
- Spotters Every last Friday for I year
- Spotters Every last Wednesday II year
- Spotter Every last Monday III year
- PG Doctor should take classes for under graduates & BSc Radiology students for 20 hours.
- Collection of 10 worked up cases by each PG during III years

#### M D thesis schedule

- **First Two months** Decision of thesis topics and review of literature
  - 15 days Synopsis of thesis & Proforma submission
  - One month Review of Literature
- Modification of master chart
  - Two years Data collection
- **After Two years** Results and Analysis
  - Sept 15 Submission of final version of thesis
  - Oct 15 Submission to university
  - Nov 15 Submission to journal

#### Leaves Permitted:

- **Casual Leaves :** Permitted
- **Special Casual Leave to attend C.M.Es and Conferences:** 15 days during entire course.
- **I year :** 02 CMEs
- **II year:** 01 CME and 01 conference with oral presentations (or) poster presentation
- **III year:** 01 CME and 01 conference with oral presentations (or) poster presentation.

- **Maternity Leave:** Whoever avails maternity leave should give exam after fulfilling the attendance and other mandatory requirements as per NMC/ university guidelines .

### III. ASSESSMENT

#### **FORMATIVE ASSESSMENT:**

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

#### **General Principles:**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form. The results of formative assessment should be maintained in the student appraisal form itself and communicated in the same format to the Examination Section while applying for the Summative Examination.

- **Internal assessment and evaluation components:**
- Log book with details of duration of postings, skills performed with remarks of the teacher/faculty member
- The research work to be assessed or reviewed every six months
- Evaluation sheets for seminar and journal clubs - Grading is to be given as per NTR UHS and at the end of each year
- Time scheduling
- Overall performance
- MCQ examination in one system every month
- Internal examination (theory) at the end of every year

## II. SUMMATIVE ASSESSMENT:

**Summative Assessment** i.e., assessment at the end of training. The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000 as amended from time to time.

### **Eligibility:**

1. As per NMC, the period of training for obtaining MD/MS degrees shall be three completed years including the examination period. The examination for MD/MS shall be held at the end of 3 academic years (six academic terms). An academic term shall mean a six month's training period. Candidates applying to appear for the examination should be in a position to complete their period of training within one month after the commencement of the examination, assuming they take no further leave other than Casual / Special Casual leave. If they are not in a position to do so due to extension of their course tenure for some reason, they shall appear in the next examination to be held within 4-6 months.
2. As per NMC all the candidates joining the Post Graduate training programme shall work as 'Full Time Residents' during the period of training and shall attend not less than 80% (Eighty percent) of the imparted training during each academic term of 6 months, including assignments, assessed full time responsibilities and participation in all facets of the educational process. Candidates appearing for the examination should be in a position to fulfil attendance requirements in all 6 terms of a PG course tenure in order to appear in the examination, by one month further from the date of commencement of the examination, assuming they take no further leave other than eligible Casual/Special Casual leave. Otherwise they will not be permitted to appear in the present examination, but may do so in the next examination after their attendance requirements are complete.
3. A postgraduate student of a postgraduate degree course in broad specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
4. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three concerned examiners.
5. The successful completion of the online course in Basic Research Methods Course by NMC by the end of their 2<sup>nd</sup> semester, with proof of its completion shall be essential before the candidate is allowed to appear for the final examination of the respective postgraduate course. The

requirement will be applicable for all post graduate students admitted from the academic year 2019-20 onwards.

## **EXAMINATIONS:**

### **Format of the Examination:**

- The examination for MD in Radio diagnosis shall be held at the end of 3<sup>rd</sup> academic year.
- The examinations shall be organized to evaluate and certify candidate level of knowledge, skill and competence at the end of the training
- Postgraduate examinations, in any subject shall consist of Thesis , Theory Papers, and Clinical/Practical and Oral examinations.
- The university shall conduct not more than two examinations in a year, for any subject. In case there are two examinations in a given year, the interval between them shall be not less than 4 and not more than 6 months.

### **1. Thesis:**

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

#### *Guide:*

- The Thesis work shall be done under the guidance of a faculty in the concerned department who is recognized as PG teacher as per the norms laid down by the NMC. However the decision of the HOD concerned is final in allocation of guide to each post graduate.

#### *Co-guide:*

- The faculty from the same or other departments who are involved actively in guiding the student may be proposed as co-guides subject to approval by the HOD concerned. The number of co-guides should be limited to two.
- The thesis topic shall be chosen before the end of eight months from the date of joining the course. The thesis topic must be approved in the Thesis protocol approval committee (TPAC) constituted by the institution.
- After obtaining approval from TPAC the thesis protocol shall be submitted to the Institutional Ethics Committee (IEC) for clearance.

- The student should submit 4 copies of the thesis along with one soft copy in CD/DVD along with plagiarism clearance report as per the university regulations (see the guidelines in Annexure II) six months before the Theory and Clinical / Practical examination
- For MD/ MS Courses, the thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination.
- A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by all the three thesis examiners.
- The Controller of Examinations shall have the powers to appoint examiners for evaluation of thesis from the panel submitted by the HOD concerned. The Guide and Co-guide can not be nominated as examiners for evaluation of thesis.

## 2. Theory:

There shall be four theory papers, each of 3 hours duration. All papers would consist of short answer questions (minimum 10) covering all aspects of the course.

- 4 Theory papers 100 marks for each paper. Total - 400 Marks

**Paper I:** Basic sciences related to Radiology (consists of Anatomy, Pathology, Basic and Radiation Physics, Imaging Techniques, and Film processing).

**Paper II:** Chest, CVS, CNS including Head & Neck, Eye, ENT, musculo-skeletal, pediatric radiology and Mammography.

**Paper III:** Abdominal Imaging including GI, GU, Hepatobiliary, endocrine and metabolic, Obstetrics and Gynaecology and Interventional radiology

**Paper IV:** Recent advances, nuclear medicine; Radiology related to clinical specialties

- The theory examinations shall be held sufficiently well in advance than the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the examination.
- Theory question papers setting shall be done by the paper setters from outside the state of Andhra Pradesh who may or may not be involved in the clinical/practical examination.

- Paper shall be set by Faculty in the concerned subject who shall be a recognized PG teacher as per NMC norms.
- The Controller of Examinations shall have the powers to appoint question paper setters and get the question papers from outside the state.

- **Moderation of Question Papers :**

A committee constituted with the approval of Director-cum-VC with the following members will moderate the theory question papers;

1. One Senior Faculty member each from medical and surgical specialties, who is a recognized PG teacher and preferably in the rank of Professor
2. Controller of Examinations
3. Dean

**3. Clinical/Practical Examination :**

- Clinical examination for the subjects in Clinical Sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a specialist/Teacher, for which candidates shall examine a minimum one long case and two short cases.
- Practical examination for the subjects in Basic Medical Sciences shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/Laboratory studies and his ability to perform such studies as are relevant to his subject.
- The Oral examination shall be thorough and shall aim at assessing the candidate knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.
- The maximum number of candidates to be examined in Clinical / practical and Oral on any day shall not exceed eight for M.D./M.S. degree .

**i. Spotters for practical examination**

Each examiner will show 10 spotters.

**ii. Specimen for practical examination**



1. There shall be panel of eight or more external examiners as advised by the Head of the department.
2. No person shall be appointed as an internal examiner in any subject unless he/she has three years experience as recognized PG teacher in the concerned subject. For external examiners, he/she should have minimum six years of experience as recognized PG teacher in the concerned subject.
3. As per MCI, the Teachers in a medical college or institution having a total of 8 years teaching experience out of which at least 4 years teaching experience as Assistant Professor with at least one research publication in indexed journals gained after obtaining postgraduate degree shall be recognized as post graduate teacher in broad specialties.
4. For all Post Graduate Examinations, the minimum number of Examiners shall be four, out of which at least two (50%) shall be External Examiners, The external examiner who fulfils the condition laid down above shall ordinarily be invited from another recognised university, from outside the State .
5. The Controller of Examinations shall have the powers to appoint two external examiners from among the panel of examiners recommended by the HOD.
6. No. of Internal Examiners - Two (HoD and one eligible PG Teacher). If internal examiner is not available in concerned specialty, the institute may appoint any eligible internal examiner as recommended by the HOD within or outside the state.
7. An examiner shall ordinarily be appointed for not more than two consecutive terms.
8. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.

#### **IV. SYLLABUS**

##### **FIRST YEAR**

- **BASIC SCIENCES**
- **Pharmacology - 10 hrs.**
  - Pharmacology of intravenous contrast media - dose, uses, adverse reactions and management of adverse reactions. Ionic and non-ionic contrast media - advantages and disadvantages CT, MR and Ultrasound contrast agents. Pharmacology and properties of Isotope pharmaceutical



agents, tracers, dose, applications. Essential drugs in the management of adverse contrast reaction, dose application and route of administration.

- **Radiological Anatomy and Applied Embryology - 30 hrs**

- The candidate should be familiar with Radiological Anatomy and applied embryology of Gastro Intestinal Tract, Genito Urinary Tract, Central Nervous System, Cardio Vascular System, Skeletal System and Cranial Nerves. They should have the knowledge of the basic anatomy relevant to all common radiological investigations and cross sectional anatomy in the axial, coronal and sagittal planes and also in oblique planes.
- Planar and Radiological Anatomy of Head ( including Brain, Eye, Para nasal sinuses), Neck, Thorax, Heart, Abdomen, Pelvis and Musculoskeletal System. Gross Radiological Anatomy of Heart and major vessels, Gastro Intestinal Tract, Central Nervous System, Thorax, Genito Urinary System, Soft tissues, Endocrine organs.

- **RADIATION PHYSICS - 100 hrs**

- Basic physics of radioactivity, production of X-ray, interaction of X-ray with matter, effects of X-ray, measurements of X-ray quantity and principles and methods of radiation protection in Diagnostic Radiology.

- **Physics of Diagnostic Radiology**

- Structure of X-Ray tube and electrical circuit of x-ray unit
- Various types of X-Ray tubes, tube assembly and Tube rating.
- Production, effects and measurement of X-Rays.
- Interaction of X-Rays with matter.
- Image intensification.
- Conventional Fluoroscopy and IITV Systems.
- Physics and DSA
- Xeroradiography
- X-ray Radiography, Photofluorography, Angiography
- Physics of Radiographic Cassettes, Films and Intensifying Screens
- Conventional and Computerised Tomography
- Mammography ( including Digital Mammography)
- Image quality and factors controlling the same in conventional and modern techniques.
- Dark room techniques including Dark room Design.
- Factor's influencing the radiographic image and assurance of quality control in radiography.
- Various artefacts in Radiology and Imaging.
- Effects and control of scattered radiation
- Physics of Collimators, Filters and Grid.
- Physics of Bone Densitometry

- Image processing (Conventional-Manual and automatic)
- Image processing (Digital)
- Digital Radiography and Computer Radiography
- Physics of Ultrasonography
- MRI, MR Spectroscopy
- Physics of PET and SPECT
- Picture Archival and Communication System (PACS)
  
- **Radiation protection**
- Radiations hazards in Diagnostic Radiology
- Essential of radiobiology and biological effects of Radiation.
- Personal monitoring, Dosimeters, permissible dose, ICRP recommendation.
- Departmental protection – National and Intentional regulations.
- Radiation Protection for Radiology workers and for the general public.
- Planning and layout of Diagnostic Radiology Department.
- Basics of X-ray equipment installation, AERB regulations, radiation acceptance test.
- Radiation units and measurements
- Exposure – dose, dose equivalent.
- Dosimetric instruments: Ionisation Chamber Systems, GM counters, Scintillation Detectors, TLD and Photographic Dosimetry
- QA & Control system.
  
- **RADIOGRAPHY AND DARK ROOM PROCEDURES – 80 hrs**
- Lectures by the faculty members
- Models and specimen demonstration by the faculty members.
- Seminars, by students, supervised by the faculty members.
- Practicals to be trained under the supervision of the faculty members.
- Conventional Radiography including views of extremities, Spine, skull, PNS Abdomen, Thorax and pelvis.
- Special Radiographic Techniques like, Stress Views, Trauma Radiography, Axial and Oblique views.
- Contrast techniques of Gastro Intestinal System, Respiratory, Hepatobiliary System, Urogenital System, Central Nervous System, Cardio Vascular System, soft tissues and Salivary glands.
- Contrast techniques in other Systems.
  - Conventional Tomography
  - OPG and Dental Radiography
  - Magnification techniques, Portable Radiography
  - Chemistry of processing & dark room procedures
  - Dark room design

**BIOSTATISTICS, RESEARCH METHODOLOGY & EPIDEMIOLOGY-20 hours**

- Introduction to health research
- Formulating research question
- Literature review
- Measures of disease frequency
- Descriptive study designs
- Analytical study designs
- Experimental study designs: Clinical trials
- Validity of epidemiological studies
- Qualitative research methods: An overview
- Measurement of study variables
- Sampling methods
- Calculating sample size and power
- Selection of study population
- Study plan and project management
- Designing data collection tools
- Principles of data collection
- Data management
- Overview of data analysis
- Ethical framework for health research
- Conducting clinical trials
- Preparing a concept paper for research projects
- Elements of a protocol for research studies
- Publication Ethics

### SECOND YEAR

- **RESPIRATORY SYSTEM AND CHEST - 100 hrs**
- Normal chest, methods of examination
- Digital Radiography in Chest.
- High KV techniques
- Mediastinal and pleural disease.
- Inflammatory and interstitial disease of the Lung.
- Pneumothorax, Pneumomediastinum, Cystic disease of Lung
- Infections of Lung, Mediastinum, Pleura and Chest wall.
- Tumours of Lung, Pleura and Chest wall.
- Pulmonary thrombo-embolism
- Trauma and post operative chest.
- Paediatric chest including congenital conditions
- Radiology of Respiratory distress (New born, Child and Adult)

- Miscellaneous Lung conditions including pneumoconiosis, emphysema, chronic bronchitis, foreign bodies, Post Radiation, Post Chemotherapy, Drowning and Poisoning.

### **CARDIO VASCULAR SYSTEM - 60 hrs**

- Methods of examination.
- Normal Heart and Pulmonary circulation.
- Basic ECG, Cardiac Ultrasonography (Echocardiography).
- Congenial Heart Disease.
- Arteries, Aneurysms, Dissections and complications.
- Acquired Heart Diseases, Cardiac Scintigraphy
- Ischaemic Heart Diseases, Cardiomyopathy
- Cardiac Tumours including Myxoma, Rhabdomyoma.
- Pericardium-Pericardial infection, Effusion, Constrictive Pericarditis, Cardiac Tamponade.
- Pericardial Calcification.
- Arteriography, Venography and Lymphangiography
- Perfusion studies and MRI and CVS
- Radiology of Post-operative Chest, Pace Maker, Electrode and Prosthetic valve.

### **GASTRO INTESTINAL TRACT - 120 hrs**

- Methods of examination and interpretation of normal and diseases of pharynx, oesophagus
- Methods of examination and interpretation of normal and diseases of stomach, Small Bowel and Large bowel
- Methods of examinations and interoperation of normal appearance and disease of Hepatobiliary System, Spleen, Pancreas, Mesentery and Retro peritoneum
- Acute abdomen - investigations and interpretations
- Radiology of Post-operative Abdomen and organ transplantation ( Liver, Pancreas, etc.)
- Paediatric Gastrointestinal Radiology
- Abdominal Trauma.
- Tumour and Predisposing conditions
- Infections and inflammatory conditions.
- Ischaemic conditions of Bowel and Mesentery and role of arteriography and Doppler study.
- Endocrine Tumours and Venous Sampling
- Upper and lower GI bleeding and GI radiological investigations including Scintigraphy

- Radiological Interventions.

### **GENITO-URINARY SYSTEM - 60 hrs**

- Methods of invitation and normal appearances.
- Congenital lesions.
- Calculus and Inflammations involving Genito Urinary System.
- Infection and inflammations involving Genito Urinary System.
- Tumours of Genito Urinary System.
- Reno vascular disease and Radiological interventions.
- Renal failure & transplant kidney
- Miscellaneous including cystic disease of kidney, nephrocalcinosis, lower urinary tract obstruction/infection- and post-operative problems.
- Trauma of Genito-urinary tract.
- Male Infertility imaging and interventions.

### **ENDOCRINE SYSTEM - 30 hrs**

- Anatomy and basic physiology of various endocrine organs.
- Various imaging modalities (including Scintigraphy, PET, SPECT) and their interpretations.
- Imaging of Pituitary, Thyroid, Adrenal, Pancreas and other endocrine organs using various Radiological techniques.

## **THIRD YEAR**

### **SKELETAL SYSTEM - 60 hrs**

- Radiographic and other imaging modalities (like Isotope study including PET and SPECT, MRI, CT etc.)
- Structure of Bone, Bone formation, remodeling and growth.
- Congenital; skeletal anomalies and dysplasia.
- Bone and joint inflammation and infection - different types of arthritis
- Degenerative disorders.
- Neoplasm including lymphoid and haemopoietic disorders.
- Metabolic and endocrine disorders.
- Skeletal trauma.
- Bone and Marrow injury
- Avascular necrosis.
- Miscellaneous conditions - joint prosthesis, instruments - application imaging, Complications.
- Radio Frequency Ablation.

### **CENTRAL NERVOUS SYSTEM AND SKULL - 60 hrs**

- Methods of examination and normal appearance of Skull, Brain and Spine and the Spinal cord.
- Applied embryology related to CNS.
- Infections and Inflammatory conditions of CNS
- Tumours and Tumour like conditions of CNS, Skull base and Calvarium.
- White matter diseases.
- Radiology of Dementia and epilepsy
- Imaging in Hydrocephalus.
- Cranio-cerebral trauma.
- Congenital and degenerative lesions of Brain and Spinal cord.
- Disorders of Spine and Spinal cord.
- Cerebral Scintigraphy and its applications.
- Vascular lesions and interventions of CNS.
- Post-operative, Post Chemotherapy and Post Radiation Changes.

### **OBSTETRICS AND GYNAECOLOGY-50 hrs**

- Obstetrics imaging (Normal/ Abnormal).
- Gynaecological imaging (Normal/ Abnormal)
- Infertility imaging and interventions, including ART.
- Gestational Trophoblastic Tumours.
- Radiology of ambiguous genitalia and Hermaphroditism.
- Doppler study and IUGR.
- Radiological interventions in Gynaecology and Obstetrics.
- Miscellaneous conditions - Amniotic fluid embolism, Remnant Syndrome, Ovarian Hyperstimulation Syndrome etc.

### **ENT, EYE AND DENTAL IMAGING - 50 hrs**

- Normal appearance and anatomy of Orbit, Eye ball, PNS and Temporal bone.
- Disease involving Larynx, PNS, Orbits and Eyeball, Ear and Mastoids.
- Imaging and interpretation of teeth and jaws
- Dental Radiography.
- Pan tomography.
- Application of various imaging modalities like CT, MRI, and Isotope studies, PET, SPECT etc. in head and neck region.

### **SOFT TISSUES AND SMALL PARTS - 30 hrs**

- Various disease, imaging and interpretations related to soft tissues and small parts (including Thyroid, Testis and Breast)

- Mammography and Sonography - Techniques and interpretations.
- Soft tissue Radiography, Ultrasonography, Computerised Tomography and MRI.

#### **EMERGENCY RADIOLOGY - 30 hrs**

- Special Radiographic technique in acute trauma and life threatening situations.
- Skill for airway maintenance.
- Deciding appropriate optimal imaging in situations like acute abdomen and other emergency situations.

#### **SPECIAL TECHNIQUES - 80 hrs**

- Ultrasonography : physical principles, techniques and interpretation.
- Computed Tomography: physical principles, techniques and interpretation.
- Magnetic Resonance Imaging : physical principles, techniques and applications.
- Digital Subtraction Angiography: physical principles, techniques and applications.
- PET, SPECT: physical principles, techniques and interpretation.
- Nuclear medicine as applied to Diagnostic Radiology.
- Newer developments in Diagnostic Radiology and Imaging - like picture archival and communication system ( PACS)
- Filmless Radiology environment.
- Special Techniques and newer developments in Conventional Radiology, US, CT, MRI, PET, SPECT.

#### **INTERVENTIONAL RADIOLOGY - 60 hrs**

- Interventional Hepatobiliary procedures.
- Interventional Cardio-Vascular procedures.
- Interventional Genito-urinary procedures.
- Interventional Gynaecological and Obstetrics Procedures.
- Venous Sampling Techniques.
- Radio frequency Ablation Techniques
- Interventions in GIT.
- Other Ultrasonography and Computerised Tomography/MRI guided procedures
- Newer developments in interventional Radiology.

#### **TEACHING AND LEARNING METHODS IN RADIODIAGNOSIS**

- Lectures by the faculty members
- Models and specimen demonstration, by the faculty members.

- Seminars, by students, supervised by the faculty members
- Practicals to be trained under the supervision of the faculty members.

#### V. TEXTBOOKS AND JOURNALS RECOMMENDED

- Textbook of Radiology and imaging – by David Sutton
- Radiology: diagnosis, imaging, intervention – by Taveras and Ferruci.
- Alimentary Tract Radiology – by Alexander R. Margulis
- Text book of Gastrointestinal Radiology – by Richard M.Gore MD, MarcS.Levine MD
- Gringer and Allison’s Diagnostic Radiology - by Grainger and Allison.
- Text book of diagnostic imaging – by Charles E.Putman, Carl E.Ravin
- Clarks positioning in Radiology
- Merrill’s atlas of Radiographic positions and procedures
- Abram’s Angiography: Vascular and Interventional Radiology – by Herbert L Abrams, D Baum Stanley, Michael J Pentecost.
- Caffey’s Pediatric Diagnostic Imaging
- Interventional Radiology of the Abdomen – by Jesoph T.M. D. Ferrucci, Jack Wittenberg
- Taveras And Ferrucci’s Radiology – by Ferrucci, Charles B. Higgins, Joseph T. Ferrucci
- CT and a MR Imaging of the whole body – by John R, Haaga, Charles F. Lanzieri, Robert C. Gilkeson
- Diagnostic Neuroradiology : A text/ Atlas – by Anne G. Osborn
- Clinical ultrasound – by Cosgrove.
- Bone and Joint Imaging – by Donald Resnick
- Diagnosis of bone and joint disorders – 6 volumes – by Donald Resnick.
- Paediatric orthopediatric Radiology – by Ozonoff
- The Radiology of skeletal Disorders – by Murray and Jacobson.
- Medical Radiation Physics – by WJ Meredith
- The fundamentals of X-Ray and Radium Physics – by Joseph Selman.
- Diagnostic ultrasound – by Carol and Rumak, S.R.Wilson and J.W.Charboneau
- Imaging of new born, infant and young adult – by Leonard E Swischuck.
- Hand book of cardio vascular Magnetic Resonance Imaging – by Gerald M.Pohost, Krishna S. Nayak
- Neuroimaging – by William W orrisson
- Magnetic Resonance Imaging in orthopaedic and Sportsf Medicine – by David W Stoller
- Felson’s Principles of Chest Roentgenology – by Lawrence R. Goodman MD
- Clinical Urography – by Howard M.Pollak MD, Bruce L. Mc Clennan M
- Christensen’s Physics of Diagnostic Radiology – by Thomas S Curry, James E Dowdey, Robert E Murry.

#### BIOSTATICS, EPIDEMIOLOGY, RESEARCH METHODOLOGY



- Rothman and Greenland, Modern Epidemiology
- David Sackett, Epidemiology
- A.B. Hill, Medical Statistics

## **JOURNALS**

- American journal of Roentgenology (AJR).
- British Journal of Radiology.
- Seminars in Roentgenology
- Radiological Clinics of North America
- American Journal of Neuroradiology
- Indian journal of Radiology and Imaging.
- Clinical Radiology
- Radiographics
- Radiology
- Pediatric Radiology
- Pediatric Radiology Journal
- Acta Radiologica
- Journal of Clinical Ultrasound
- Ultrasound in Medicine and Biology
- Ultrasound International
- Ultrasound in Obstetrics and Gynecology
- Neuroradiology
- Skeletal Radiology ( The Journal of Skeletal Radiology)
- Clinical Imaging
- Seminars in ULTRA SOUND, CT AND MR.

**ANNEXURE-I**

**Postgraduate Students Appraisal Form**

**Pre / Para /Clinical Disciplines**

\*\*\*

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sl. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based/recent advances learning										
2.	Patient based /Laboratory or Skill based learning										
3.	Self directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs										
6.	Thesis/Research work										
7.	Log Book Maintenance										

**Publications**

**Yes/No**

**Remarks\***

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**\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.**

**SIGN.OF ASSESSEE**

**SIGN.OF FACULTY I/C**

**SIGN.OF HOD**

## PLAGIARISM

**SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES, TIRUPATI**  
(A University established by an Act of A.P. State Legislature)

**GUIDELINES FOR 'PLAGIARISM' CHECK**  
**WHILE SUBMISSION OF THESIS/DISSERTATION BY**  
**DM/M.Ch/MD/MS/Ph.D students**

**Ref.: Circular vide Roc.No.SVIMS/CE/63/plagiarism/2019, dated 06/12/2019**

The students of the MD/MS/ DM/M.Ch., courses & PhD Scholars and respective Chief Guides are hereby informed that w.e.f. 01.01.2020 FN onwards the Plagiarism checker has been implementing in SVIMS University for ThefRses/Dissertations submitted by the students of following courses towards partial fulfillment of the course curriculum.

**1. D.M. 2. M.Ch. 3. M.D. 4. M.S. 5. Ph.D.**

They requested to follow the following guidelines while submitting the Thesis/Dissertation and produce a Plagiarism clearance report to the Examination Section as per SVIMS policy;

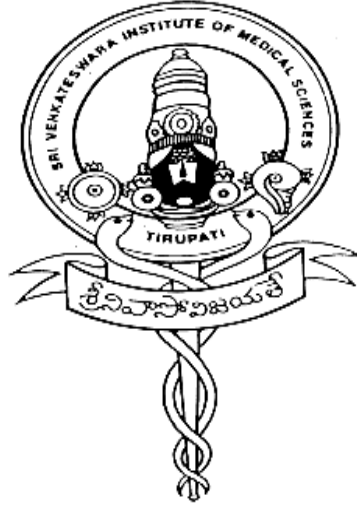
1. Plagiarism Detection Software (PDS) utilized for the purpose is "URKUND" provided to SVIMS by UGC.
2. They should get the Plagiarism check done from the UGC Coordinator of SVIMS - Dr.A.Omkar Murthy, Librarian, SVIMS.
3. The Chief Guide of the student concerned is responsible for approving and certifying the plagiarism report.
4. Acceptable percentage of plagiarism
  - a. Up to 10% - Acceptable
  - b. If report shows more than 10% plagiarism, the thesis/dissertation is to be revised and resubmitted again and get the report
5. The University Coordinator Dr.A.Omkarmurthy, Librarian, SVIMS is advised to collect the CD from the student and give a certified copy of plagiarism check done.
6. At the time of plagiarism check, the student has to submit to the UGC Coordinator a CD containing soft copy of the thesis/dissertation in a **PDF format** in two files ;
  - a. First file: should contain the entire thesis/dissertation from beginning to end (for submission to shodhganga-INFLIBNET)
  - b. Second file: should contain the thesis from "**Introduction**" to "**Conclusion/result**" part of the thesis/dissertation (for plagiarism check)
7. The final plagiarism check report to be certified by both, the Chief Guide of the respective student & UGC Coordinator. The original copy of the same along with CD submitted to the UGC Coordinator to be enclosed along with hard copy of thesis/dissertation at the time of submission to the Controller of Examinations.
8. All the above mandatory procedures are to be ensured by the Chief Guide and the Thesis/Dissertation must be submitted along with approved Plagiarism check report to the Controller of Examinations within the time limit stipulated for submission of the Thesis/Dissertation for the respective courses for the said academic year.

###

# **SRI VENKATESWARA INSTITUTE OF MEDICAL SCIENCES**

*(A University established by an Act of Andhra Pradesh Legislature)*

**TIRUPATI – 517 507**



## **LOG BOOK**

### **COMMON FOR MD/ MS/ DM/ M.Ch. POSTGRADUATES**

Name of the Candidate .....

Subject / Course .....

Admn. No. ....

## PROFORMA FOR INTERNAL ASSESSMENT OF POSTGRADUATES

Name of the postgraduate :

Subject (specialty) :

Date of joining :

Address for communication with

Mobile No. :

Email address :

Period of Assessment : From ...../...../..... To ...../...../.....

Posting during above period :

Name of the guide :

Assessment done by :

*(Preferably be done by the faculty with whom the resident worked for most part of the period)*

### **Quality parameters being Assessed:**

1. Donor / Patient Evaluation
2. Academic Knowledge about Donor / Patient's Problems
3. Curiosity about unexplained Observations
4. Donor / Patient Care
5. Donor / Patient / Relation Education
6. Academic Presentation
7. Punctuality / discipline

*Signature of the candidate*

*Signature of the guide*

*Signature of the HoD with seal*





### SEMINARS / TOPIC REVIEWS PRESENTED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

#### Guidelines for evaluation of Seminar Presentations

Sl.No.	Items for observation
1.	Whether other relevant publications consulted
2.	Whether cross references have been consulted
3.	Completeness of Preparation
4.	Clarity of presentation
5.	Understanding of subject
6.	Ability to answer questions
7.	Time scheduling of the preparation
8.	Appropriate use of Audio-Visual Aids
9.	Overall Performance
10.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.



### JOURNAL / TOPICS REVIEWED

S. No.	Date	Topic	Role Presenter / Moderator	Signature of supervising Faculty

### Guidelines for evaluation of Journal Review Presentations:

Sl.No.	Items for observation
1.	Article chosen is relevant and appropriate
2.	Extent of understanding of scope & objectives of the paper by the candidate
3.	Whether cross references have been consulted
4.	Whether the understood the Material, Methods, Observations and statistical analysis?
5.	Ability to respond to questions on the paper / subject
6.	Audio-Visual aids used
7.	Ability to analyze the paper and co-relate with the existing knowledge
8.	Clarity of presentation
9.	Any other observation

\* Corollary Grading in all Check lists:

Poor -0, Satisfactory-1, Average-2, Good-3, Very Good-4.

**CASES PRESENTED IN MORTALITY CONFERENCE**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LIST OF CLINICO PATHOLOGICAL CONFERENCES PRESENTED**

<b>S. No.</b>	<b>Topic</b>	<b>Signature of supervising Faculty</b>

**LAB / INVASIVE PROCEDURES PERFORMED**

<b>S. No.</b>	<b>Date</b>	<b>Procedures</b>	<b>Complications if Any</b>	<b>Signature of supervising Faculty</b>

### CONFERENCES ATTENDED

S. No.	Name	Role	Signature of supervising Faculty

### PUBLICATIONS

S. No.	Topic	Journal	Role

### BEDSIDE CASE DISCUSSION

S. No.	Date	Diagnosis	Signature of Faculty Presented to

## SUMMARY OF LOG BOOK

*(To be filled at the end of the course & retained in this book)*

Name of the student : Admn. No.  
Name of the Course : From \_\_\_\_\_ To \_\_\_\_\_  
Name of the Institute:

- 1) No. of Journal Review Presentations : Presented ..... Attended .....
- 2) No. of Seminar Presentations : Presented ..... Attended .....
- 3) No. of Clinical Presentations : Presented ..... Attended .....
- 4) No. of Case Presentations : Presented ..... Attended .....
- 5) No. of UG Teaching Programmes : Conducted ..... Attended .....  
(Theory class / Clinics / Practicals /  
Demonstrations / Tutorials)
- 6) No. of PG Teaching Programmes : Attended
- 7) No. of Investigative Procedures : Performed ..... Assisted..... Observed...
- 8) No. of Major Operations / : Performed  
..... Assisted..... Observed...  
Procedures /  
Experiments
- 9) No. of Minor Operations / : Performed  
..... Assisted..... Observed...  
Procedures /  
Experiments
- 10) No. of Emergencies : Performed  
..... Assisted..... Observed...
- 11) No. of Medico-legal work : Performed  
..... Assisted..... Observed...
- 12) No. of Public Health Visit /  
Social work /  
Survey /  
Immunization /  
Camps
- 13) No. of Clinico-Pathological Conference: Presented ..... Attended.....
- 14) No. of special investigation / : Conducted ..... Attended .....
- Procedure
- 15) No. of events attended Conferences..... Symposia .....  
Workshops ..... CME .....
- 16) Any other activities :

*Signature of the candidate*

*Signature of the guide*

*Signature of the HoD with  
seal*

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