MALLA REDDY VISHWAVIDYAPEETH

SCHOOL OF ALLIED HEALTHCARE SCIENCES AND TECHNOLOGY

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Hyderabad-500055
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Program

Masters of Science (M.Sc.)

Radiation Therapy Technology

2026

COURSE STRUCTURE

Masters of Radiation Therapy Technology

MASTER OF RADIATION THERAPY TECHNOLOGY

Introduction:

Learning Objectives: At the completion of this course, the student should be -

1. Able to execute all routine radio therapeutic procedures as per prescription of Radiation Oncologist.
2. Able to assist the radiation oncologist and medical physicist in treatment of cancer patients, radiotherapy planning & procedures, and implementation of new equipment/technology.
3. Able to provide adequate knowledge about the safe handling of medical radiation sources, keeping in mind the radiation protection of staff, patients and public.
4. Able to transfer knowledge and skills to students as well as younger professionals.
5. Able to actively participate and also independently work in research in the field of radiotherapy delivery/clinical research/trials and related areas.

Expectation from the future graduate in the providing patient care.

1. The coursework is designed to train students to work in conjunction with radiation oncology team including radiation oncologists, medical physicists and other members, in the application of prescribed doses of ionizing radiation for the treatment of malignant or benign disease.
2. Course work includes physics, anatomy and physiology, dosimetry, clinical oncology, radiation safety, research methodology, patient and data management, and teaching methodologies. The student will be skilled in management of patients, administration of prescribed radiation treatment, provision of patient support, and imparting education to students and young professionals in the field.
3. Employment opportunities can be found in hospitals in both private and public sectors as well as in independent cancer treating centres.
4. After the completion of the course, the degree holder is expected to register with the Atomic Energy Regulatory Board (AERB) or with other regulatory/standardizing body

instituted by Ministry of Health and Family Welfare. The student is also expected to keep updated information on the live register and must re-register after every 5 years to ensure employability in the market.

5. RTT post-graduate is encouraged to keep abreast with the emerging technologies and research activities. The professional should opt for continuous professional education credits offered by national and international institutes.

Eligibility for admission:
Selection procedure:

1. He/she has passed the BSc in Radiotherapy Technology or equivalent examination of a recognized Indian University or a duly constituted Board with pass marks (50%).
2. He/she has to furnish at the time of submission of application form, a certificate of physical fitness from a registered medical practitioner and two references from persons other than relatives testifying to satisfactory general character.
3. Admission to M.Sc. RTT course shall be made on the basis of eligibility and an entrance test to be conducted for the purpose. No candidate will be admitted on any ground unless he/she has appeared in the admission test and interview.
    a. Entrance test, to be conducted by the university as per the syllabus.
    b. Successful candidates on the basis of written test will be called for the interview & may face an interview board. The interview board will at least have one senior radiation oncologist and one senior medical physicist as members, and one eligible RT Tech.
    c. During subsequent counselling (s) the seat will be allotted as per the merit of the candidate depending on the availability of seats on that particular day.
    d. Candidate who fails to attend the Medical Examination on the notified date(s) will forfeit the claim for admission and placement in the waiting list except permitted by the competent authority under special circumstances.
    e. The name of the student(s) who remain(s) absent from classes for more than 15 days at a stretch after joining the said course will be struck off from the college rolls without giving any notice.

Duration of the course
Duration of the course: 2 years or 4 semesters. (690 hours of Theory & 1490 hours of Practical Classes) and mandatory submission of research thesis.

Total hours - 2180

Medium of instruction:
English shall be the medium of instruction for all the subjects of study and for examination of the course.

Attendance:
A candidate will be permitted to appear for the University Examination for any semester if he / she secure not less than 75% of attendance in the number of instructional days/ practical at industry during the calendar year, failing which he / she should complete the number of

days/hours and undergo the next semester/final examination conducted by the university.

Assessment:
The examination to the first/second year shall be open to a student who:

Has remained on the rolls of the course concerned for full on academic year preceding the examination and having attendant not less than 75% of the full course of lectures and 80% practical separately held for the purpose in each year.

Exit Examination:
The pattern of examination would be Semester based. Each Semester would typically last for 5 months which would be followed by a Residency &/short vacation

The Student should meet the criteria for Attendance (75% Attendance for Theory and 80% Attendance for Practical) and Assessment Criteria (based on periodic test and maintenance of Log book /Practical Work book) for every Semester.

This would be followed by Theory Examination and Practical Examination which would mark the end of each semester. A student has to secure minimum 40% marks in each theory subject and minimum 40% marks in the Practical Examination to get promoted to the next Semester. Marksheet will be provided at the end of each Semester Examination which would display the passed subjects and the failed subjects. The Marksheet will also mention if the student has passed or has been detained during a particular semester

Arrears Examination:

Maximum Backlog of 2 subjects per semester will be allowed **i**n the case of students not securing the minimum passing marks and having failed the theory/practical examination. The backlog subject will need to be cleared in the subsequent semester along with the present semester. The total backlog during any semester will not exceed 2 subjects.

If a student has failed in more than 2 subjects in a particular semester or has an overall backlog of more than 2 subjects during any semester, the student will be detained during that semester and will be promoted to next semester only if he has cleared the backlog subjects or has a maximum backlog of 2 subjects during any semester.

Backlog examination can also be taken up during the period of Internship.

Passing Certificate:

A student will be provided a Passing Certificate only after successful completion of all the Semesters and the Dissertation. 80% attendance will be required for the entire duration of the Residency. Exit Examination:

The pattern of examination would be Semester based. Each Semester would typically last for 5 months which would be followed by a short vacation.

The Student should meet the criteria for Attendance (75% Attendance for Theory and 80% Attendance for Practical) and Assessment Criteria (based on periodic test and maintenance of Log book /Practical Work book) for every Semester.

This would be followed by Theory Examination and Practical Examination which would mark the end of each semester. A student has to secure minimum 40% marks in each theory subject and minimum 40% marks in the Practical Examination to get promoted to the next Semester. Marksheet will be provided at the end of each Semester Examination which would display the passed subjects and the failed subjects. The Marksheet will also mention if the student has passed or has been detained during a particular semester

Arrears Examination:

Maximum Backlog of 2 subjects per semester will be allowed **i**n the case of students not securing the minimum passing marks and having failed the theory/practical examination. The backlog subject will need to be cleared in the subsequent semester along with the present semester. The total backlog during any semester will not exceed 2 subjects.

If a student has failed in more than 2 subjects in a particular semester or has an overall backlog of more than 2 subjects during any semester, the student will be detained during that semester and will be promoted to next semester only if he has cleared the backlog subjects or has a maximum backlog of 2 subjects during any semester.

Backlog examination can also be taken up during the period of Internship.

Passing Certificate:

A student will be provided a Passing Certificate only after successful completion of all the Semesters and the 12 month period of Internship. 80% attendance will be required for the entire duration of the internship.

Curriculum Outline

FIRST SEMESTER

Sl. No.	Course Titles	Hours		
		Theory	Practical	Total
MRTT-001	Human Anatomy & Physiology (refresher)	30	30	60
MRTT-002	Pathology & terminology	30	50	80
MRTT-003	Imaging Modalities (on line/off line) related to radiotherapy	30	70	100
MRTT-004	Equipment Operation, Safety and Maintenance	30	70	100
MRTT-005	Patient care and evaluation-I	30	70	100
	Residency – part I		100	100
TOTAL		150	410	540

SECOND SEMESTER

Sl. No.	Course Titles	Hours		
		Theory	Practical	Total
MRTT-006	Hospital Management	30	70	100
MRTT-007	Patient Care & Evaluation-II	30	50	80
MRTT-008	Radiation Hazards, Evaluation and Control	30	50	80
MRTT-009	Adoption of New RT Technology in an RT centre	30	50	80
MRTT-010	Research Methodology and Biostatistics	30	50	80
	Residency – part II		120	120
TOTAL		150	390	540

THIRD SEMESTER

Sl. No.	Course Titles	Hours		
		Theory	Practical	Total
MRTT-011	Clinical Radiobiology /Radiation Toxicities	40	50	90
MRTT-012	Stereotactic Radiotherapy/Radiosurgery/SBRT Radiotherapy	50	50	100
MRTT-013	Motion Management in RT	50	50	100
MRTT-014	Nuclear Medicine Imaging & its role in RT	30	40	70
MRTT-015	Teaching/Training Tools/Methodology	30	10	40
	Residency – part III		140	140
TOTAL		200	340	540

FOURTH SEMESTER

Sl. No.	Course Titles	Hours		
		Theory	Practical	Total
MRTT-016	Special RT Procedures	50	50	100
MRTT-017	Recent Advances in Radiotherapy	50	50	100
MRTT-018	Radiotherapy Patient and Data Management	50	50	100
	Residency – part IV – Dissertation	40	200	240
TOTAL		190	350	540

FIRST SEMESTER

Human anatomy & physiology:

Introduction:

- Overview of the structure
- Organization of the human body
- Anatomical terminology as a communicative device.

Cell-

- Cell morphology and diversity
- Introduction to ultra-structure and function of cell organelles and cell inclusions.

Tissues-

Macroscopic and microscopic studies of epithelial tissue, general connective tissue, cartilaginous tissue, bone tissue, muscle tissue, nervous tissue and the integument, major functional advantages of each tissue type.

Skeletal Muscles-

Major skeletal muscles of the head, Neck, Thorax, Abdomen and upper and lower limbs.

General Osteology-

- General morphology of bones
- Structural classification of bones
- Identification and naming of individual bones of the skeleton
- Development and growth of skeletal tissue and bones.

General Astrology-

- Structural and functional classification of joints
- General morphology of a synovial joint and associated structures
- Movements made available by synovial joints
- Detailed Osteology and Astrology-
- Naming and identification of osteological features of individual human bones
- Naming, Identification and application of classifications to the major joints of the human body

- Examples of variability in the human skeleton.

Cardiovascular System:

- Macroscopic features, function and location of the adult and foetal heart and the location of major arteries and veins
- Macroscopic features of blood vessels including arteries, veins and capillaries; morphological features of the cellular components of blood.

Lymphatic System-

Macroscopic features, Major function and location of the lymphatic vascular structures, Lymph nodes, Tonsils and other mucosa-associated lymphatic tissue, Spleen and thymus; Microscopic anatomy of lymph nodes.

Nervous System-

- Macroscopic features and major functions of the brain and spinal cord
- Morphological features and major functions of the contents of the peripheral nervous system and autonomic nervous system.

Respiratory System-

- Macroscopic features and major functions of the nasal cavity
- Paranasal sinuses
- Pharynx, Larynx, Trachea, Bronchi, Lungs and Thoracic wall including the thoracoabdominal diaphragm
- General microscopic anatomy of the epithelium of the respiratory tract and the lungs.

Digestive System-

Macroscopic features and major functions of the Mouth, Salivary glands, Pharynx, esophagus, stomach, small and large intestines, liver pancreas, biliary system and peritoneal cavity; general microscopic anatomy of the esophagus, stomach, small intestine, pancreas and liver.

Urinary System:

Macroscopic features, Major functions and location of the kidneys, Ureters, Urinary bladder and the urethra; Microscopic anatomy of the kidney.

Endocrine System –

- Macroscopic features
- Location and basic function of the hypothesis cerebri
- Thyroid gland
- Parathyroid glands
- Suprarenal glands
- Pineal gland and organs with a minor endocrine function
- Microscopic anatomy of the hypothesis cerebri

- Thyroid gland, Bulbourethral glands.

Male Reproductive System-

Macroscopic features, Major functions and location of the scrotum, Testes, Epididymis, Ductus deferens, Inguinal canal, Seminal vesicles, Prostate gland, Bulbourethral gland and penis; Microscopic anatomy of the testis.

Female Reproductive System-

- Macroscopic features
- Major functions and location of the ovaries
- Uterine tubes, Uterus, Vagina and external genitalia; Microscopic anatomy of the ovary.

Special Senses-

Macroscopic features and major functions of the contents of the orbital cavity, the eyeball, Lacrimal apparatus, and external, Middle and internal ear; Microscopic anatomy of the photosensitive retina.

Upper Limb:

- Relevant osteology
- Detailed plain radiographic anatomy of skeletally mature and immature individuals
- Regional and surface anatomy of the shoulder, axilla, and upper limb with an emphasis on blood and lymphatic vessels
- MRI and axial sectional anatomy of the glen humeral joint.

Lower Limb-

- Relevant osteology
- Detailed plain radiographic anatomy of skeletally mature and immature individuals
- Regional and surface anatomy of the hip, thigh, crus and pes, with an emphasis on blood and lymphatic vessels
- MRI of the knee joints; angiography of the lower limb.

Head and Neck-

- Relevant osteology of the skull and cervical vertebrae, Surface anatomy, Lymphatic,
- Major blood vessels and nerves of the head and neck

Regional anatomy of the brain and its meanings-

- Axial, Coronal and Sagittal sectional anatomy of the head and axial sectional anatomy of the neck
- Plain radiographic anatomy
- Computerized tomography
- MRI and angiography of the head and neck.

Cross sectional anatomy of body:

- Radiographic anatomy of different radiographs in various projections
- Surface anatomy and applied anatomy pertaining to Radiology.

General Physiology:

- Structure of cell membrane.
- Transport across cell membrane and Homeostasis
- Blood- A B O System & mismatch-transfusion
- WBC plasma protein Erythrocytes
- Haemoglobin. Normal values of Blood (composition & function)

Nerve Neuron AHC- Structure, Classification & Properties

- R.M.P., Action potential
- Propagation of nerve impulse
- Degeneration & regeneration
- Reaction of degeneration.

Muscle- Structure -properties -classification -excitation/contraction coupling, Motor, EMG - factors affecting muscle transmission, neuromuscular transmission.

C.N.S. & P.N.S. - Receptor Physiology:

- Classification & properties
- Synapse structure
- Properties, & transmission
- Reflexes-structure, properties, & transmission

- Sensory & Motor Tracts -effect of transaction (Complete & Incomplete) at various levels Physiology of Touch , Pain, Temperature & Perception
- Physiology of Muscle Tone (muscle spindle), Stretch, Vestibular Apparatus mainly organ Anatomy, Function of Basal ganglia, Thalamus, Hypo-Thalamus, Pre-Frontal lobe, P.A.S., Sensory / motor cortex, Sensory / motor cortex, Limbic System, Learning , memory & condition reflex, Physiology of Voluntary movement.

Excretory System

- Kidneys-(short note) -structure & function, urine formation
- Maturation - neural control- neurogenic bladder, Temperature Regulation, Circulation of the skin-body fluid-electrolyte balance, Endocrine, Secretion - regulation & function of Pituitary-thyroid-parathyroid Pancreas

Reproductive System-

- Functions of Estrogen
- Progesterone & Testosterone

Puberty & Menopause Special senses

Eye-Errors of refraction-accommodation-reflexes-dark & light Adaptation photosensitivity Ear, skin.

Respiratory System-

- Introduction
- General organization
- Mechanics of respiration
- Pulmonary Volumes & capacities
- Anatomical &Physiological Dead space- ventilation/perfusion ratio
- Alveolar ventilation
- Transport of respiratory gases
- Nervous & Chemical control of respiration
- Pulmonary function tests-Direct & indirect method of measurement
- Physiological changes with altitude & acclimatization

Cardiovascular System-

- Structure & properties of cardiac muscle
- Cardiac cycle
- Heart rate regulation-factors affecting Heart Rate
- Blood pressure-
- Definition -regulation-factors affecting

Cardiac output-

- Regulation & function affecting
- Peripheral resistance
- Venous return
- Regional circulation-coronary-muscular
- Cerebral, Normal ECG

Pathology & terminology:

Introductory Pathology:

- Cellular adaptation and cell death
- Inflammation and repair; infection; circulatory disorders; immune defence
- Genetics of disease
- Neoplasia
- Cell injury and adaptation-
- Atrophy, Hypertrophy, Metaphase, Hyperplasia
- Classification of tumours, Premalignant lesion
- Types of inflammation & system manifestations of inflammation
- Disorders of vascular flow & shock (Brief introduction)
- Oedema, Hyperemia or congestion, Thrombosis, Embolism, Infarction shock, Ischemia, Over hydration, Dehydration
- The Response to infection
- Categories of infectious agents, Host barriers to infection
- How disease is caused
- Inflammatory response to infectious agents
- Hematopoietic and Lymphoid System-
- Haemorrhage, Various type of Anaemia, Leukopenia, Leucocytosis, Bleeding disorders coagulation mechanism.

Fundamentals of Medical Terminology:

- Word Roots, Prefix, Suffix, Abbreviations & Symbols
- Introduction to Anatomy & Physiology
- Organs & Systems
- Gastro intestinal, Respiratory, Circulatory, Renal, Reproductive, Nervous, Common 2
- Diseases & Procedures, Gastro intestinal, Cholecystitis, Cholelithiasis, Appendicitis, Intestinal Obstruction, Peritonitis Gastro copy- Endoscopy, Laparotomy, laparoscopy, Common Diseases & Procedures, Respiratory, Tuberculosis, Bronchial Asthma, Respiratory Failure, Pulmonary Emboli son,

Pneumonia, Bronchoscopy, Pulmonary Function test, Cardio-Pulmonary, Resuscitation.

Fundamentals of Medical Terminology-II:

Circulatory ,Hypertension ,Coronary Artery Disease ,Arrhythmias, Cardiac Arrest ,Shock, Deep Vein thrombosis (DVT) , ECG,2D Echo Cardiogram, Coronary Angiography, Cardiac Catheterization, Stress test, Pacemaker, Renal, Nephrotic Syndrome ,Urinary Tract Infection Renal /Bladder Stones Intravenous Pyelography, Cystoscopy, Urinalysis, Haemodialysis, Peritoneal Dialysis ,Reproductive, Female - breast cancer /Self Examination, Menstrual Disorders, Dysmenorrhea, Premenstrual Syndrome (PMS), Menorrhagia Ovarian, Cyst, Fibroids, Malignancy, Infertility Mammography, Ultra Sound, Laparoscopy, IV F, Tubectomy, D& C, Male - Prostate Enlargement, Hydrocele, Impotence, T transurethral Research of Prostate, Nervous Stroke (Cerebral Vascular Accident),Brain Tumour, Brain Injuries, Spinal Cord Injuries, Lumbar Puncture, Myelography, CT Scan, MRI, EEG, EMG, Oncology, Investigations, Tumour markers, RECIST Criteria for response evolution

Imaging Modalities (off/on line) related to radiotherapy

Patient imaging holds crucial importance in radiotherapy. An RTT has to be well versed with various imaging modalities that are used in radiotherapy.

1. Positioning Terminology in Radiology
2. Ultrasonography
3. Radiography and fluoroscopy
4. CT
5. MRI
6. PET/SPECT
7. MV and kV CBCT
8. Optical Imaging
9. Angiography

The students will serve a rotation in the radiology wing of the hospital to acquire the skill needed to use the imaging equipment in radiotherapy.

Equipment Operation, Safety and Maintenance

In addition to refreshing the knowledge of various radiotherapy equipment their functioning and operations, the students will focus on safety and maintenance aspects of the advanced equipment namely a dual energy linac with on- and off-line imaging, HDR brachytherapy system and the sophisticated immobilization and stereotactic RT accessories.

Patient care and evaluation-I.

Patients of all ages and performance status come for radiotherapy. An RTT has to be skilled to handle these patients physically and psychologically. This also requires managing the attendants of the patients.

- Procedures for patient transfer such as table to table, table to wheelchair, wheelchair to bed, bed to stretcher, the three-man lift, and draw sheet lift
- Procedures for turning patients who have severe trauma, Unconsciousness, Disorientation, or Amputated limbs
- Radiographic procedures

Management of infectious patients:

- Psychological considerations for the management of infectious patients
- The vital signs used to assess patient condition
- Measurements of temperature, pulse, blood pressure, and respiration
- Clinical measurement and recording of temperature, pulse, blood pressure and respiration.
- Symptoms of cardiac arrest, anaphylactic shock, convulsion, seizure, hemorrhage, apnea, emesis, aspiration, fractures and diabetic coma/insulin reaction
- Acute care procedures for cardiac arrest, Anaphylactic shock, Convulsion, Seizure,
- Hemorrhage, Apnea, Emesis, Aspiration, Fractures, and diabetic coma/insulin reaction

  Use of medical equipment and supplies in treating medical emergencies.

Residency part –I

In the residency the professional is expected to work and contribute in the radiation therapy unit.

SECOND SEMESTER

Hospital management:

Health care – an overview:

- Functions of Hospital administration
- Modern techniques in Hospital management
- Challenges and strategies of Hospital management

Administrative Functions:

- Planning, Organizing, Staffing, Leading and Controlling Organizational Structure, Motivation and leadership.
- Designing health care organization.

Hospital Management:

- Medical record, House-keeping services.
- Laboratory performance.
- Management of biomedical waste.
- Total patient care – indoor and outdoor.
- Nursing and ambulance resources.
- Evaluation of hospital services. Quality assurance.
- Record reviews and medical audit.

Patient care & evaluation-II

The teaching/training in patient care/ handling continues with the view to take on more responsibility for the same. Communication with other care givers including the ones from out-side the radiation oncology system for better and efficient management of patient care.

Radiation hazards, evaluation and control

Concept of Time , Distance and Shielding, Calculation of workload, Calculation of Weekly dose to the radiation worker and general public, good work practices in radiotherapy/ diagnostic radiology, planning consideration for radiotherapy installation including work load, use factor & occupancy factors, effect of different shielding material. Biological effect of radiation, role of RTT in predicting and managing acute and late radiation toxicities.

Adoption of New RT Technology in an RT centre

Any sophisticated RT equipment commissioned for treatment is operated by an RTT. Before using the equipment for treatment, the operation and safety aspects of the new technology have to be thoroughly understood by the operating RTT.

Take lead in learning the various steps required to adopt the technology: Training/learning from the application specialist and equipment manual about all the functional/safety features of the equipment. Organize/manage the user‘s training classes/demonstrations with the trainers.

Research Methodology & Biostatistics

The objective of this course is to help the students understand the basic principles of research and methods applied to draw inferences from the research findings. The research methods course will cover an introduction to health systems, health systems research, ethical issues in research, defining a research problem, research design, research tools besides basics of data management and report writing

- Introduction to Health systems
- Identifying research problem
- Ethical issues in research
- Developing a research proposal
- Research design
- Research tools and Data collection methods
- Sampling methods
- Bias and confounding
- Introduction to program evaluation
- Data management
- Analysing information for drawing inferences
- Report writing
- Group presentations

Biostatistics: The objective of this module is to help the students understand the significance of data and data analysis needed for research purposes

1. Concepts of Biostatistics
    - Sample and population. Statistical definitions. Random sampling. Testing of hypothesis.
        - Statistical tools for collection, presentation and analysis of data relating to causes and one incidence of diseases.
        - Measurement of central tendency.
        - Measures of variation. Frequency distribution.
        - Concept of Probability: Laws of Probability. Probability Distribution: Binomial, Normal and Chi-square distribution
        - Commonly used procedures and test of significance and estimation

- Correlation and regression
- Test of significance namely Z test, T test, Chi square test, F test
- Analysis of variance.

2. Types of Data
3. Research tools and Data collection methods

4. Sampling methods
5. Developing a research proposal

Residency part –II

In the residency the professional is expected to work and contribute in the radiation therapy unit.

THIRD SEMESTER

Clinical Radiobiology & Radiation Toxicities

Concepts of clinical radiobiology are needed to appreciate the basis of radiotherapy and fractionation in radiotherapy:

1. Cell Survival
2. 5 Rs of Radiotherapy
3. History of radiation effect modelling
4. LQ model and BED concepts
5. TC/NTCP and therapeutic ratio
6. Radiobiology of hyper and hypo-dose fractionation
7. Early and late reacting tissues
8. Managing radiation toxicities

Stereotactic Radiotherapy (SRT)/Radiosurgery (SRS)/SBRT Radiotherapy

1. Technical, Physical and Biological aspects
2. Patient set-up and immobilization
3. Safety aspects
4. Patient scheduling and management

Motion Management in RT

Managing the motions (intra-fraction/inter-fraction) is crucial for successful outcome of radiotherapy. From immobilization till treatment delivery all steps need constant and consistent monitoring to reduce the errors/uncertainties. Various methods of motion management such as breath control, motion restriction, gating and tracking need to be taught and clearly understood by the student.

Nuclear Medicine Imaging & its role in RT

For tumour delineation and follow-up nuclear medicine scanning namely SPECT and PET are used. Also, therapeutic radiation doses are also given in nuclear medicine for example iodine therapy for cancer of thyroid and bone pain palliation. Isotopes used in nuclear medicine, imaging methods, patient care should be well understood by the student. Precautions/procedures during nuclear medicine scans for radiotherapy planning. Radionuclide scanning including thyroid up takes measurement Rectilinear scanner Gamma camera, PET, SPECT-their principles working applications and advancements

Teaching/Training Tools/Methodology

1. Teaching/ training aids for RTT
2. Micro teaching and communication

3. Assessing methodology for performance
4. Concepts of clinical research/trials

Residency part –III

In the residency the professional is expected to work and contribute in the radiation therapy unit.

Special RT Procedures

1. Total body irradiation
2. Intraoperative EBRT
3. Intra/preoperative brachytherapy
4. Electronic brachytherapy

Recent advancements in modern radiotherapy:

1. Unflat/ Heterogenous photon beams
2. Proton and heavy ion therapy
3. 4-D and biologically guided radiotherapy
4. Newer isotopes for brachytherapy
5. Optical/EM probes for motion management

Radiotherapy Patient and Data Management

Managing patient demographic, diagnostic and RT data including 3D imaging data, integrity of data transfer among various workstations in RT, scheduling patient appointment based on the treatment technique, easy data retrieval for research.

Residency part IV - Dissertation:

Each candidate will have to carry out of a dissertation on the related subject. The dissertation will be guided by one or two members of the faculty (radiation oncologists/medical physicists/RTT) of the department. The dissertation will be evaluated by the External/Internal Examiners. The final dissertation duly approved by the External/Internal examiners will be submitted to the Dean‘s office with the result. The dean‘s office will send the dissertation to the library for record.

Skills based outcomes and monitorable indicators for Senior Radiation Therapist

Competency statements

1. Demonstrate knowledge to interpret and evaluate a treatment prescription
2. Demonstrate understanding of treatment planning in the radiotherapy process and performs the necessary patient positioning/immobilization and imaging protocols.
3. Communicates relevant information to other members and completes accurate documentation

4. Demonstrates knowledge of accurate position and ability to immobilize all patients as per instructions
5. Demonstrates ability to prepare the shielding devices as per protocol
6. Conducts the simulation and mark-up procedure for all standard treatment techniques
7. Demonstrates ability to carry out the daily organization of the treatment unit
8. Practices accurate treatment documentation

9. Demonstrates ability to interpret, apply and disseminate information as a member of the radiotherapy team
10. Demonstrates professional behaviour
11. Demonstrates a sensitive and caring attitude towards the patient
12. Demonstrates ability to accurately and consistently set-up and treat the patient
13. Demonstrates ability to prepare the patient for their first treatment
14. Evaluates and monitors the patient performance status
15. Monitors, manages and records the patient‘s side effects throughout the course of treatment
16. Advises patient on appropriate nutrition, sexual function, rest, skin care, nausea and other symptoms
17. Demonstrates skill to support and care for the patient during a brachytherapy procedure
18. Demonstrates ability to carry out the necessary data transfer checks
19. Acquires the initial verification images
20. Demonstrates ability to carry out geometric treatment verification
21. Demonstrates ability to carry out corrective actions as per instructions
22. Demonstrates knowledge to check the dose delivered as per laid down protocol
23. Implements health and safety procedures
24. Demonstrates ability to interpret, apply and disseminate information as a member of the radiotherapy team
25. Follows the departmental radiological safety protocol and assists in protocol formulation
26. Demonstrates knowledge and skills to carry out the daily/weekly Quality Control (QC) checks on patient treatment/prescription data.
27. Participates in clinical research activities and able to formulate research problems
28. Demonstrates skills for teaching/communication