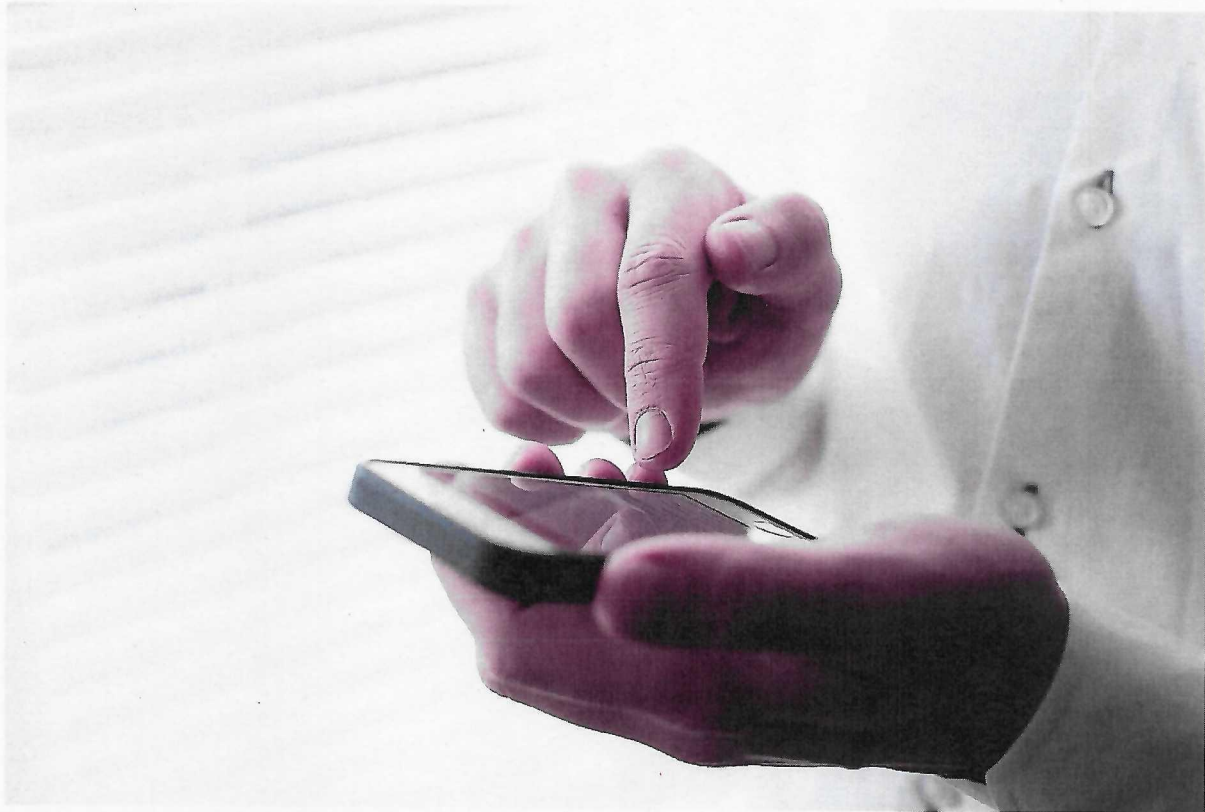


Syllabus for MD (Radiodiagnosis) Programme



Guru Gobind Singh Indraprastha University

A State University established by the Govt. of NCT of Delhi

University School of Medicine and Allied Health Sciences

MD Radiodiagnosis

Programme objectives

The objective is to train a student to become a skilled and competent radiologist to conduct and interpret various diagnostic / interventional imaging studies (both conventional and advanced imaging), to organize and conduct research and teaching activities and be well versed with medical ethics and legal aspects of imaging / intervention.

Specific Learning Objectives

A resident on completing his/her (Radiodiagnosis) should be able to

- Acquire good basic knowledge in the various sub-specialties of radiology such as Neuro-radiology, GI-radiology, Uro-radiology, vascular-radiology, musculoskeletal, Interventional radiology, Emergency radiology, Pediatric radiology and Mammography.
- Independently conduct and interpret all routine and special radiologic and imaging investigations.
- Provide radiological services in acute emergency & trauma including its medical legal aspects.
- Elicit indications, diagnostic features and limitation of applications of ultrasonography, CT and MRI and should be able to describe proper cost-effective algorithm of various imaging techniques in a given problem setting.
- Perform various image guided interventional procedures for diagnosis and therapeutic management.
- Undertake further specialization in any of the above mentioned branches in Radiodiagnosis such as Gastrointestinal radiology, Uro-radiology, Neuro radiology, Vascular radiology, musculoskeletal radiology, Interventional Radiology etc.
- Formulate basic research protocols and carry out research in the field of radiology related clinical problems.
- Work as a Senior Resident/consultant in Radiodiagnosis and conduct the teaching programme for undergraduates, postgraduates as well as para medical and technical personnel.
- To interact with other specialists and super-specialists so that maximum benefit accrues to the patient.
- Organize CME in the specialty utilizing modern methods of teaching and evaluation.

M.D. Radiodiagnosis

Syllabus of M.C.I.

approved as such
H. S. S.

- Imparting training in both conventional radiology & modern imaging techniques so that the candidate is fully competent to practice, teach and do research in the broad discipline of radiology including ultrasound, Computed tomography and Magnetic Resonance Imaging.

Postgraduate Training

The training is spread over 3 year years includes following components:

- 1) Theory Lectures for Radiation Physics.
- 2) Rotational posting in various sub-specialties.
- 3) Seminars, case discussion, journal club.
- 4) Research methodology and thesis.

Clinical Sciences

- Theoretical back ground including recent advances should be the pre-requisite to the clinical training of post graduate students.

Training in different organ systems:

Various Diseases involving the following systems (A Student should have adequate knowledge of procedures and interpretation of all conventional and advanced imaging techniques and interventions whenever needed.

- 1) Musculo Skeletal System- Interpretation of diseases of muscles, soft tissue, bones and joints including congenital, inflammatory, traumatic, metabolic and endocrine, neoplastic and miscellaneous conditions.
- 2) Respiratory System – Disease of the chest wall, diaphragm, pleura and airway; pulmonary infections, pulmonary vasculature; pulmonary neoplasm; diffuse lung disease; mediastinal disease, chest trauma; post-operative lung and X-ray in intensive care.
- 3) Cardiovascular System – Diseases and disorder of cardiovascular system (congenital and acquired conditions) and the role of imaging by conventional radiology, ultrasound, colour Doppler, CT, MRI, angiography and Isotopes Studies.
- 4) Gastro intestinal tract and hepato – biliary pancreatic system – Diseases and disorders of mouth, pharynx, salivary glands, esophagus, stomach, small intestine, large intestine, diseases of omentum, peritoneum and mesentery: acute abdomen, abdominal trauma. Disease and disorders of hepato-biliary pancreatic system.
- 5) Urogenital System – Various diseases and disorders of genitor – urinary system. These includes: congenital, inflammatory, traumatic,

neoplastic, calculus disease and miscellaneous, degenerative, metabolic & miscellaneous conditions.

- 6) Central Nervous System(C.N.S.) includes imaging (using conventional and newer methods) and interpretation of various diseases and disorders of the head, neck and spine covering, congenital, infective, vascular, traumatic neoplastic degeneration metabolic & miscellaneous condition.
- 7) Radiology of Emergency Medicine.
- 8) Radiology of Obstetric and Gynecology.
- 9) Evaluation of Breast by imaging and interventions.
- 10) ENT, EYES, Teeth.
- 11) Endocrine glands.
- 12) Clinical applied radionuclide imaging.
- 13) Interventional radiology related to different systems of body.

During each posting, candidate should be able to perform the procedures and interpret the findings.

During the three-year course, the student will work in the following

Areas:-

1.	Conventional Chest	3 Months
2.	Conventional Musculoskeletal including skull, Spine, PNS	3 Months
3.	G.U.	2 Months
4.	G.I.T.	3 Months
5.	US including doppler	6 Months
6.	CT (BODY+Head-3 months each)	6 Months
7.	Emergency radiology	3 Months
8.	M.R.I.	3 Months
9.	Interventional Radiology including angiography	4 Months
10.	Nuclear Medicine	1 Months
11.	Elective posting	2 Months

Total	36 Months
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PROPOSED SCHEDULE FOR ROTATION OF RESIDENTS

1st Year (1/6)	Chest	Chest	Musculo- Skeletal	G.U.	G.U.	US
	(2/6)	US	CT (H)	CT(B)	G.I.T.	G.I.T.
2ND Year (3/6)	Chest + Mammo- Graphy	Musculo Skeletal	Musculo Skeletal	G.I.T.	Emg.	CT(H)
	(4/6)	CT (B)	US+ Doppler	Intervention	US	Emg.
3rd Year (5/6)	CT (Head)	MRI	MRI	Inter- vention	Inter- vention	CT(B)
	(6/6)	MRI	Emg.	Intervention	US	Elective

PAPER (Theory)

- 1 Basic sciences related to Radiology (anatomy, pathology, basic and radiation physics, imaging techniques and dark room processing).
- 2 CVS, Resp. GIT (including Hepato biliary), Endocrine, Chest, Mammography
- 3 Genitourinary, retroperitoneal, CNS including head and neck, Musculoskeletal system, Obs. And Gynae, ENT and Eye and interventional radiology
- 4 Recent Advances and nuclear medicine, Radiology related to clinical specialties

Practical

- A) One Long and Two Short Cases -
- B) Practical and Viva

- I. Spot Film Diagnosis (40-50) -
- II. Radiation Physics -
- III. Techniques -
- IV. Implements/Contrast Media -
- V. Nuclear Medicine -
- VI. Pathology -

COURSE CONTENT

A) Physics, Apparatus, Photography and Film Faults

1. Introduction of general properties of radiation and matter. Fundamentals of nuclear physics and radioactivity.
2. Production of x-rays
3. X-ray Generating Apparatus
4. Interaction of x-rays and gamma rays with matter and their effects on irradiated materials.
5. Measurement of X and gamma rays
6. Interaction of x-ray with the patient
7. The Radiological Image
8. The Image Receptor
9. Contrast Enhancement
10. Radiation hazards and protection
11. Quality Assurance
12. Fundamentals of electromagnetic radiation
13. Characteristic properties of X-rays.
14. X-ray equipments
 1. Conventional equipments.
 2. Fluoroscopy-Conventional and Imaging Intensifier.
 3. Advanced equipments-US, CT, MRI, Doppler, Angiography, Cine Fluoroscopy and Cine Angiography
15. Quantity Assurance & evaluation of performance of X-Ray equipments.

16. Contrast Media – types, chemical composition, mechanism of action, dose schedule, route of administration, adverse reaction and their management.
17. Nuclear Medicine: Equipments and isotopes inn various organ systems and recent advances in the field of nuclear medicine.
18. Picture archiving and communication system (PACS) and Radiology information system (RIS) to make a film less department, Telemedicine, Digital Imaging.
19. Recent advance in radiology and imaging.

B. Practical Schedule – Physics

1. Film characteristics
2. Effectiveness of Lead Apron and other protective Devices
3. Beam parameters check
4. Optical Radiation field alignment
5. Assessment of Scatter radiation
6. Quality control of x-rays and Imaging equipments
7. Evaluation of performance of a film processing unit.

C. Practical radiography and Dark room technique

1. Dark room techniques
2. Radiography of the spine, abdomen, pelvic girdle and thorax
3. Radiography of the extremities
4. Radiography of the skull
5. Contrast techniques and interpretation of GI tract, biliary tract, etc.
6. Contrast techniques and interpretation of the C.N. system
7. Contrast techniques and interpretation of the Cardiovascular system including chest.
8. Miniature radiography, Macro-radiography and magnification techniques
9. Dental and portable radiography

D. ANATOMY

Gross and cross sectional Anatomy of all the body systems.

E. PATHOLOGY

Gross morphology of pathological condition of systemic diseases.

F. RADIOLOGY-COURSE CONTENTS

1. Bones and joints
2. Respiratory system
3. Cardiovascular system
4. Gastro intestinal tract
5. Urogenital tract
6. C.N.S. including spine
7. Radiology of obstetric and Gynaecology
8. ENT, EYES, Teeth, Soft tissue breast
9. Endocrine glands
10. Clinically applied radionuclide imaging
11. Contrast Agents

Contrast Media, their types, formulation, mechanisms of action, dose schedule, routes of administration, adverse reactions and their management.

SCHEME OF EXAM FOR MD/MS COURSES

1. Four Theory papers each of three hours duration (100 marks each with minimum of 3 questions)
2. Questions should be in structured format for Long Answer Questions and short answer Questions.