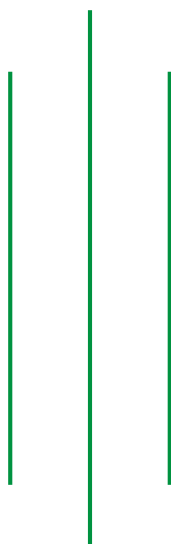


**Syllabus for Licensing Examination of  
M.Sc. in Medical Imaging Technology/M.Sc. in  
Radiology Technology (M.Sc. MIT)  
2021**



**Nepal Health Professional Council**

Bansbari, Kathmandu

## Table of Content

S.N.	Subject	Marks
1	Anatomy Radiological Anatomy/Crosssectional Anatomy	15%
2	Radiography Radiographic& Interventional Technique / Equipment For Diagnostic Imaging	20%
3	CT, MRI & Fusion Technology Physics And Equipment/ Technique& Protocols	40%
4	Radiation Biology, Protection & Quality Assurance	15%
5	Research Methodology	5%
6	Hospital Management, Code Of Ethics And Health Sys- tem Of Nepal	5%
	Total	100%

# Anatomy

## 1. Radiological Anatomy

### 1.1 Introduction

### 1.2 Radiology Anatomy Of

- Skull
- Spine
- Chest
- Abdomen
- Pelvis
- Upper Limb
- Lower Limb

## 2. Crossectional anatomy

### 2.1 Brain

- Crossectional anatomy of brain in axial, sagittal and coronal plane
- Correlate with CT & MRI Images

### 2.2 Neck & Chest

- Crossectional anatomy of Neck & Chest in axial, sagittal and coronal plane
- Correlate with CT & MRI Images

### 2.3 Abdomen

- Crossectional anatomy of Abdomen in axial, sagittal and coronal plane
- Correlate with CT & MRI Images

### 2.4 Joint

- Crossectional anatomy of Shoulder Joint in axial, sagittal and coronal plane
- Crossectional anatomy of Wrist Joint in axial, sagittal and coronal plane
- Crossectional anatomy of Hip Joint in axial, sagittal and coronal plane
- Crossectional anatomy of Knee Joint in axial, sagittal and coronal plane
- Crossectional anatomy of Ankle Joint in axial, sagittal and coronal plane

# Radiography

## 1. Radiographic & Interventional Technique

- Upper limb
- Shoulder girdle and thorax
- Lower limb
- Vertebral Column
- Pelvic Girdle And Hip Region
- Skull
- Chest radiography
- Mammography
- Contrast media
- Radiological procedure of GI tract

- Radiological procedure of urogenital tract
- Radiological procedure of biliary tract
- Radiological procedure of vascular and nervous system
- Interventional technique
- Vascular embolization including embolic materials used for this purpose and basic technique for vascular embolization

## 2. Equipment For Diagnostic Imaging

- X-ray tubes
- Radiographic couches, stands and tube supports
- Exposure timers and factors
- Beam centering & beam limiting devices
- Portable and mobile radiographic equipment's
- Control of scattered radiation Grids
- Fluoroscopic equipment, Digital fluoroscopy
- Tomography, Digital Tomosynthesis
- Vascular imaging equipment- DSA
- Mammographic equipment, Digital mammography
- Digital imaging Technology
- Computed Radiography, Direct Radiography, DICOM & PACS

# CT, MRI & Fusion Technology

## 1. Physics & Equipment

- Basic principles of CT, Generations of CT, Image reconstruction in CT
- CT system components (x-ray tube, detectors and filters)
- Image quality and artefacts in CT
- Working principle of Spiral/helical CT Explain slip-ring technology
- Working principle of Multi-detector (MD) CT and its advantages
- Post-processing techniques in CT Explain recent advances in CT Technology
- Basic principles of MRI, Image Weighted in MRI
- MRI system components (Magnet and Coils)
- Image quality and artefacts in MRI
- Post-processing techniques in MRI Explain recent advances in MRI Technology
- Fusion Technology
- Basic principle of PET CT, SPECT CT, PET MRI
- Instrumentation of PET CT, SPECT CT, PET MRI
- Image formation on fusion technology

## 2. Technique & Protocols

- Patient preparation for CT examination
- Routine Protocol for CT Head, PNS, Temporal bone, Orbits, Neck

- CT Angiography Head & Neck
- CT of Thorax Routine Thorax, HRCT, CT Pulmonary Angiography
- Protocol Coronary Angiography
- Routine Whole Abdomen, Triple phase CT, CT Portography, CT Enteroclysis CT Colonoscopy, CT KUB, CT IVU
- Protocol for Joints and bone, Spine, CT Guided Intervention
- Patient preparation for MR imaging.
- Routine Brain Protocol, Stroke Protocol, Epilepsy protocols, Protocol for Cranial Nerve, Protocol for Pituitary Fossa, Cerebral MR Angiography Cerebral MR Venography, Protocol for Orbit & PNS, Routine Neck Protocol MR Angiography of the Carotids
- Protocol of Brachial Plexus Protocol for Breast Imaging MRI Protocol for Liver Imaging, Protocol for Pancreatic Imaging, MR Cholangio-pancreatography (MRCP), Female Pelvis Protocol for Male Pelvis Protocol MR Angiography of the Renal Arteries MR Venography of the Inferior Vena Cava Protocol.
- Protocols for joint and bone, Protocol for Cervical, Dorsal and Lumbar Spine, MR Myelography.
- MR Spectroscopy, Perfusion, fMRI, DTI, DWI, Dynamic MRI
- Whole body MRI, Protocol for PET, PETCT, PET MRI

## Radiation Biology, Protection & Quality Assurance

- Radiation biology, Biological effect of radiation, LET, RBE, Lethal dose, Stochastic and deterministic effect. Cell survival curve, Gonad dose, Radiation units
- Principle of radiation protection, Cardinal principle, Radiation protection requirement and organization, Radiation protection for patient, professional and public. Radiation protection for pregnancy. Dose limit
- Quality control for general radiography, CT and MRI

## Research Methodology

- Define research and identify types of research. Describe purpose of research, explain scope of research. Discuss ethical considerations.
- Thesis and scientific paper writing.
- Data collection methods, Normal curve, Null and alternative Hypothesis
- T- test, z test and chi square test, Sampling, Probability and non-probability sampling.
- Application of research in medical field.

## Hospital Management, Code Of Ethics And Health System Of Nepal

- Principle of Management and Organizational Behavior
- Hospital Planning and Human Resource Management
- Management and planning of radiology department
- Ethics and code of practices of specialization in medical imaging

- Health system of Nepal, NHPC, WHO.
- Law and regulation of Health system