MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)
Grade 'A' Accredited by NAAC
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Curriculum for

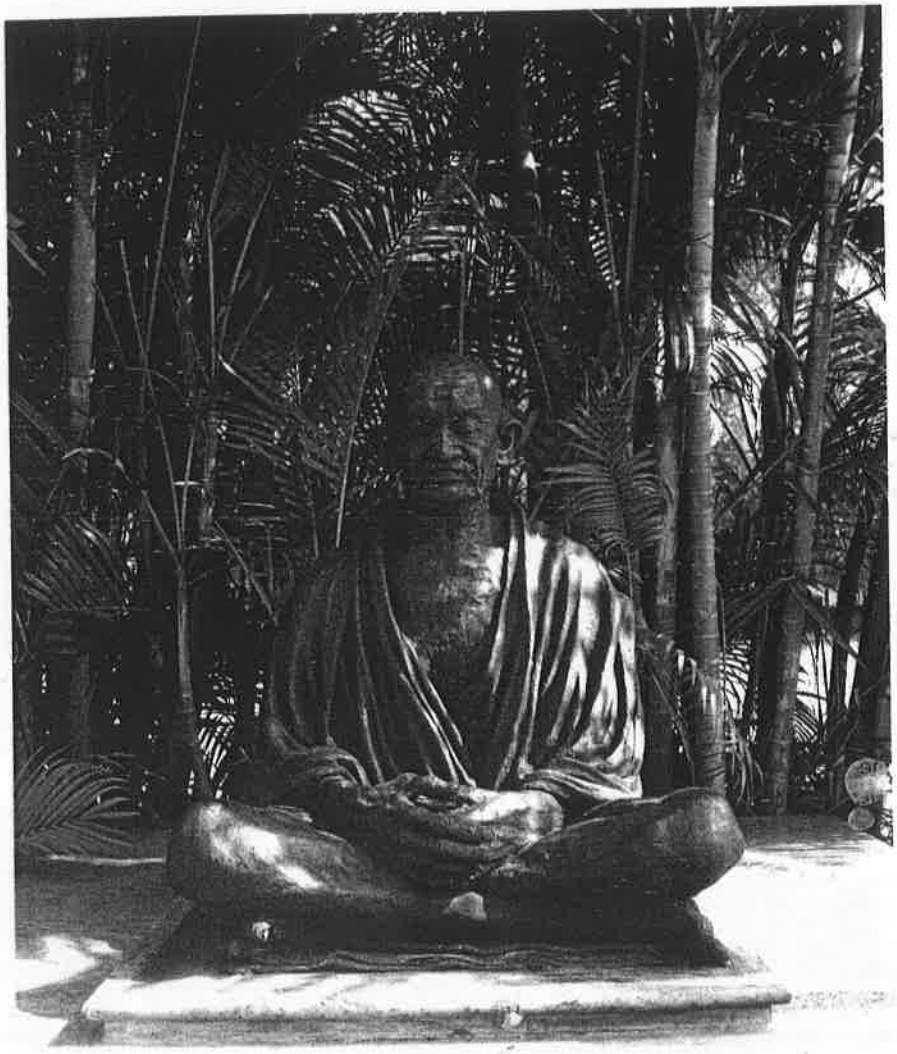
Diploma in Medical Radio-Diagnosis

Amended upto BOM- 55/2018, Dated 27/11/2018.

Amended History

1. Approved as per BOM– 04/2007, Item 12.1, Dated 14/12/2007.
2. Amended as per BOM-55/2018, [Resolution No. 4.13], [Resolution No. 4.5.4.2], Dated 27/11/2018.

INSPIRING MINDS



Mission

To improve quality of the life for individuals and community by promoting health, preventing and curing disease, advancing biomedical and clinical research and educating tomorrow's Physicians and Scientists.

Vision

By 2020 the MGM University of Health Sciences will rank one of the top private Medical Institution. This will be achieved through ground breaking **discoveries in basic sciences and clinical research** targeted to prevent and relieve human suffering, **excellence in Medical Education** of the next generation of academic clinicians and intrinsic scientists.

MGM University of Health Sciences will transform the **Education of** tomorrow's Physicians and Scientists conducting Medical **Research** to advance health and improving lives by providing world-class patient care.

Many see the 21st Century as the golden age of biomedical research. The MGM University of Health Sciences will position for leadership at the horizon of this new era to promote and stabilise stand human health with a standard of excellence.

Chancellor's Message

It is my pleasure to welcome you to join constituent colleges of Mahatma Gandhi Misson's (MGM) University of Health Sciences, Navi Mumbai. I wish to avail this opportunity to apprise you and your parents about the academic excellence of the deemed university.

The MGM University of Health Sciences was established u/s 3 of UGC Act, 1956 vide HRD Notification No.F.9-21/2005-U.3(A) dated 30-8-2006. The MGM University is an outcome of untiring efforts of our educationists, professionals, social activists, technocrat, students and parents. The Mahatma Gandhi Mission Trust that manages the University of Health Sciences and over 40 institutions in Navi Mumbai, Aurangabad, Nanded, and Noida has the vision to empower the masses with the availability of state-of-the-art education. Most of our institutions have ISO certifications that further endorse our commitment to stringent quality standards. I am proud to state that we have succeeded in these accomplishments during our journey of the past 25 years.

I recollect the memories of struggle and determination when the MGM Trust established its two medical colleges, one each at Navi Mumbai and Aurangabad some twenty years ago. Both the medical colleges have grown into institutions imparting both undergraduate and postgraduate courses, and delivering quality health care to communities in their respective areas. While both colleges are engaged in their primary functions of teaching, patient care and research, they have also excelled in their pursuit for advancement of science and in taking health services to communities through extension programmes. A shining example is the establishment of the Department of Infectious Diseases in 1993 in collaboration with the University of Texas-Houston, USA. This department has established the state-of-the-art clinical services and laboratories for research and care of infectious diseases and received the acclaim of Director General of ICMR when he stated "MGM is the first medical college in India to establish a separate department of infectious diseases. This is the need of the hour." The department has undertaken path-breaking research and shaped the course of our national control programmes on HIV/AIDS and tuberculosis. The original research of the constituent colleges has been acclaimed among the scientific world globally.

In an era of economic liberalization and the competition among varsities, both in and out of India, the task of grooming professionals who will compete with the best in the world , is tough. To aid our efforts to excel, MGM University of Health Sciences has the latest research facilities, a dedicated research faculty, as well as an array of distinguished visiting faculty members. The quiet ambience of our campuses, the well filled library with subscriptions to international and national journals, and the lush-green gardens add to our accomplishments.

Considering the manpower needs of educational, industrial agricultural, and health sector to maintain their steady growth, several fresh M.Sc. courses have courses have been launched. M.Sc. courses introduced at the
University from the current academic year shall provide knowledge, skills and subsequent employability that are at par with the counterparts in India and abroad. The curricula of the courses have been designed by experts and peer-reviewed with an emphasis on the job requirements of educational institutions, industries, health care, and research institutions. These courses will empower the students to choose a career in a classroom, a research laboratory or an industry. I am happy that the university is ticking towards the pinnacle with the introduction of these value-added postgraduate courses in medical biotechnology, medical genetics and other basic sciences.

Finally, I wish to place on record my gratitude to the founder members, stake-holders, faculty, staff, students and their parents for providing the MGM Trust with your advice and support.

Once again, it is my pleasure to welcome you to join constituent colleges of MGM University of Health Sciences' at Navi Mumbai and Aurangabad.

Kamal Kishore Kadam
Chancellor

Dr R.D.Bapat
Vice Chancellor

Dr S.N.Kadam
Pro Vice Chancellor

Dr N.N.Kadam
Director (Examination)

Dr Ajit shroff
Dean (Aurangabad Campus)

Dr Z.G. Badade
Registrar

Dr G.S.Narshetty
Dean (Navi Mumbai Campus)

SYLLABUS FOR M.D. & D.M.R.D. (RADIO-DIAGNOSIS & IMAGING SCIENCES.

GOAL:- The broad goal of the teaching & training of Post-graduate student in Radio-Diagnosis is to make them understand & implement the knowledge regarding the role of various imaging modalities, helpful in the management of different clinical conditions. At the end of his/her training, he/she should be capable to take up a career in teaching institution or in diagnostic center or in research..

OBJECTIVES :-

a) Knowledge:- At the end of the course the student shall be able to:

1) Explain the interaction of tile X-rays with mater to produce an image.

2) Fromiliarize with the principles of various imaging modalities (e.g. .US/CT/MRI) & their applications in medicine.

3) Explain the biological hazards of ionizing radiation & protective measures.

4) Explain the normal Anatomy, Physiology of various organs and their deviation from normal) & its consequences.

5} Summarize the fundamental aspects of embryology & alteration in development with reference to congenital anomalies.

6) Select appropriate imaging modality for- study of specific condition.

7) Explain .the role of imaging, pre-operative, intra-operative & post-operative Conditions.

8) Evaluate role of imaging modalities in various therapeutic applications (Interventional Radiology)

9) Update information about recent advances in imaging sciences.

10) Effectively organize & supervise the diagnostic proceduces to ensure quality control/assurances

b) Skills:-

At the end of the course the student shall be able to :

1) Make use of conventional & other imaging sciences to achieve definitive diagnosis.

2) Analyse & interpret imaging data.

3) Demonstrate the skills of solving Scientific & clinical problems & decision making.

4) Develop skills as a self:-directed learner recognize cointinuing educational needs, select & use appropriate learning resources.

5) Demonstrate Comperence in basic concepts of research methodology & be able to critically aualyse relevant literature.

c) Integration-

Knowledge acquired in Radio diagnosis shall help the students to integrate imaging techniques with structure & function of the human body in health & disease.

M.D. & D.M.R.D. (RADIODIAGNOSIS)
PAPER –I

Radiation Physics. Protective measures & Physics involving imaging techniques and related basic sciences e.g. Anatomy. Physiology and Pathology.

TOPICS.

1) Radiations and production of X-rays

2) X-ray generators

3] Basic interactions between X-Rays and matter

4] Attenuation.

5] Filters and grids.

6] Luminescent screens.

7] Physical and Photographic characteristics of X-ray film & film processing

8] Fluoroscopic imaging -viewing and recording.

9] Radiographic image and its geometry.

10] Body section radiography.

11] Steroscopy.

12] Xeroradiography.

13] Computed tomography.

14] Ultrasound.

15] Radiation's hazards and protection.

16] Digital Radiography.

17] Nuclear magnetic resonance.

18] Magnetic resonance imaging.

19] Wet processing of films -Chemistry of Developer, fixer etc,

20] Dry processing – chemistry of films & its processing.

M.D..(RADIO-DIAGNOSIS)
P APER- II

Radiological Imaging in congenital & systemic diseases- I

a) Respiratory system: Congenital anomalies, Pediatric chest, Chest wall, pleura, diaphragm, Mediastinum, Pulmonary infections, Airway obstruction, Pulmonary neoplasms, Diffuse pulmonary diseases.

b) Cardio-vascular system: Congenital heart Disease's, left-to-right shunts Cyanotic heart diseases, Acquired valvular heart diseases, Ischemic heart disease, Pulmonary circulation, cardiomyopathy, cardiac tumors, Pericardium, thoracic aorta.

c) Gastro Intestinal Tract: Oesophagus, Stomach, Duodenum, Small intestine large bowel, mesentry & omentum, Pediatric abdomen.

d) Hepato-biliary: Liver, Biliary tract, Pancreas.

M.D. (RADIO-DIAGNOSIS)

PAPER-III

Radiological Imaging in congenital & systemic diseases-II

a) Skeletal system: Skeletal trauma benign lesions, malignant lesions, Myeloproliferative & similar disorders, metabolic and endocrine diseases, skeletal dysplasias and malformation syndromes, joint disease, bone and joint infection, radiology of soft tissues, musculo-skeletal system in children.

b) Genito-urinary system: Renal parenchymal diseases, Renal masses. Calculus disease and urinary obstruction, urinary bladder and prostate, Renò-vascular disorders, injuries, Renal failure and transplantation, pediatric uroradiology Imaging in obstretics and gynecology, imaging of breast.

c) CNS: Skull, Intra-cranial tumors, Intrà-cranial infections, Cerebro-vascular disease, cranial and intracranial malformatins trauma, CSF disturbances, degenerative diseases of spine infections of spine, spinal tumours.

M.D. (RADIO-DIAGNOSIS)

PAPER-IV

Miscellaneous, Radiological procedures, Interventional Radiology, .Recent advances and newer techniques.

- Orbit, ENT, Dental, Reticule-endothelial system, Oncology, HIV infection and AIDS,

- Arteriography, venography.....etc.

D.M. R. D.

PAPER I : Radiation Physics, Protective measures and Physics involving imaging techniques. Same as M.D.

PAPER II : Radiological imaging in congenital and systemic diseases. (Respiratory system, Cardio Vascular System, Gastro Intestinal Tract, Skeletal system Genito Urinary System).

PAPER III : Hepato-biliary system, CNS, Miscellaneous, Radiological procedures and Interventional procedures & Interventional Radiology.

PRACTCAL EXAMINATION :

(As per Direction No. 01/2008 dtd. 26/05/2008)

SYLLA BUS/COURSE CONTENT

MD/DMRD

A. BASIC RADIOLOGY

I. IMAGING TECHNIQUIES AND MODALITIES

1.1.1 Department Organization: Digital Imaging and PACS:

1.1.2 Digital imaging and PACS: Picture Reliving and Communication System

1.1.3 Digital Imaging and PACS: what should a radiologist expect from PACS

1.1.4 Digital Imaging and PACS: Image processing in Computed Radiography

1.2 Intravascular Contrast Media

1.3 Whole body Computed Tomography: Recent Advances

1.4 Magnetic Resonance Imaging Basic Principles

1.5 Ultrasound : general Principles

1.6 Radionuclide imaging

1.6.1 Radionuclide imaging: General Principles

1.6.2 Radionuclide imaging: Pediatric Nuclear Medicine

1.7 Dual Energy X-ray Absorptiometry

1.8 Functional and Physiological Imaging

1.9 Medicolegal issues in Diagnostic Radiology

1.10 Radiation Protection and patient doses in diagnostic radiology

II. RESPIRATORY SYSTEM :

1.1 Techniques of Investigations

1.11 Standard Techniques

1.12 Tomography: a) Conventional film Tomography

b) Computed Tomography

1.1.3 Digital Radiography

1.1.4 Magnetic Resonance Imaging

1.1.5 Radionuclide Imaging a) Ventilation

b) Other thoracic scanning techniques

1.1.6 Pronchography

1.1.7 Ultrasound

1.1.8 Angiography

1.1.9 Lung Biopsy & Other Interventional Techniques.

1.2 Normal Chest:

1.2.1 The Lungs (Radiological Anatomy} & CT Terminology)

1.2.2 The Central Airways

1.2.3 The Lungs beyond Hila

1.2.4 The Hila

1.2.5 The Mediastinum : a) CT & MRI

b) Plain film appearances

i) The junctional lines :

ii) The right Mediastinum above azygous vein

iii) The left Mediastinum above Aortic arch

vi) The supra aortic Mediastinum on lateral view

v) The right Middle Mediastinum border below azygous arch.

vi) The left cardiac border below aortic arch

vii) The para spinal lines

viii) The retrosternal line

1.2.6 The Diaphragm

1.3 Interpretation the Chest Radiograph :

1.3.1 Identification of the Radiograph

1.3.2 Technical Consideration

1.3.3 Detection and Description of abnormalities: .i) Silhouette Sie

ii) Alterations

iii) Consolidation

iv) Collapse

v) Nodular Opacities

vi) Ring Opacities

vii) Linear/ Intestitial/ Pleural, /Chest Wall Opacities.

viii) Abnormal Transradiancy

1.4 The Chest Wall, Pleura & Diphragm

1.4.1 Chest Wall :

i) Soft tissue /Breasts

ii) Ribs /Sternum/Clavicle, Spine

1.4.2 The Pleura :

i) Normal Pleura

ii) Pleural Pathologies

1.4.3 The Diaphragm :

i) Height/ Eventration/Movements/Paralysis

ii) Hernias/Trauma/Neoplasm

1.5 The Mediastinum :

1.5.1 Techniques. .

1.5.2 Mediastinal Masses: i) Thyroid/ Para Thyroid Messes/Thymic tumors/Tymic hyperplasia/Teratoma/ Cermcell Tumor.

ii) Mediastinal lymphadenopthy

iii) Neurogenic Tumors

iv) Extra medullar heamatopes/Mesenchymal Iumors/ Hernaration of / Mediastinal lipomatosis/. Aneusyrum

1.5.3 Differential Diagnosis:

1.5.4 Other Mediastinal Lesions: i) Acute/ fibrosing Medlastinitis

1.6 Pulmonary Infections in Adults .

1.6.1 Pneumonia

1.6.2 Associated features and complications of pneumonia

1.6.3 Pulmonary tuberculosis

1.6.4 HIV & AIDS

1.7 Large Airway Obstruction :

1.7.1 Collapse: General features /Collapse of individual lobes / entire lung/ segmental collapse/ Rounded /obstructive collapse

1.7.2 Obstructive Pneumonities: Bronchoscope-Bronchiectasis

1.8 Pulmonary lobar Collapse essential considerations :

1.9 Chronic inflow Obstruction :

1.9.1 Asthama:

1.9.2 Choronic Bronchitis and Emphysema

1.9.3 Bronchiolitis

2.0 Pulmonary Neoplasms :

2.0.1 Bronchial Carcinomas

2.0.2 Benign Pulmonary Tumors

2.0.3 Malignant Lymphoma

2.0.4 Metastases

2.0.5 The solitary Pulmonary Nodule

21 Diffuse Pulmonary. Disease / Industrial Lung Disease / HRCT :

2.1.1 Pulmonary Oedema :

2.1.2 Diffuse pulmonary Haemorrhage

2.1.3 Inhalation of particulate matter

2.1.4 Diffuse pulmonary Fibrosis

2.1.5 Sarcoidosis / Collagen Vascular Disease *I* Systemic Vasculitidis *I* Lymphoid Disorders of Lungs / Pulmonary Eosinophilia *I* Drug induced Lung Disease

2.2 Chest Trauma :

2,3 Pulmonary Thromboembolism :

2.3.1 Imaging Chest Radiograph/ Radionuclide Study *I* Pulmonary Arteriography/ CT/ MRI

2.4 .Post Operative & Critically ill Patients :

2.4.1 Cardiopulmonary Disease

2.4.2 Post Thoracotomy Radiograph

2.4.3 Support and Monitoring apparatus

2.4.4 Radiation Therapy

2.5 Chest Radiography after Lung Transplantation :

26 Congenital Pulmonary Anamolies :

2.6.1 Abnormal Development of Lung Bud

2.6.2 Abnormalities of separation of the lung had from the foregut

2.6.3 Abnormalities of Pulmonary Vasculature

2.6.4 Ectopic of Hamartomatous Development

2.7 The Infant and Young Child :

2.7.1 Pathologies of Diaphragm

2.7.2 Pleural Abnormalities

2.7.3 Inflammation

2.7.4 Airway Obstruction

2.7.5 Diffuse Lung Disease .

2.7.6 Respiratory Distress in Newborn Baby

2.8 Interventional Techniques in Thoracs:

2.8.1 Biopsy Procedures

2.8.2 Thoracic Drainage Procedure

2.8.3 Thoracic Sympathectomy

2.8.4 Therapeutic Embolisation

2.8.5 Dilatation & Stenting Techniques

2.8.6 Extraction Techniques.

III. THE HEART AND GREAT VESSELS

3.1 Cardiac Anatomy and Enlargement- :

3.1.1 Plain Radiography

3.1.2 Enlargement of various chambers on Plain Radiography

3.2 Echo Cardiography including Doppler .

3.3 Nuclear Cardiology:

3.4 Digital Imaging of Cardiovascular System .

3.5 Magnetic Resonance of Heart and Circulation .

3.6 Congenital Heart Disease :

3.6.1 General Principles

3.6.2 Left to right shunts .

3.6.3 Central Sinuses

3.6.4 Other Congenital Heart Disease

3.7 Aquired Heart Disease: i) Non Rheumatic/ Rheumatic Mitral VD
ii) Tricuspid VD
iii) Aortic VD

3.8 Ischaemic Heart Disese : i) Coronary Atreriography
ii) Left Ventriculography
iii) Angina Pectoris
iv) Myocardial Infarction
v) Mechanical Complication of MI

3.9 Pumlonary Circulation : i) Anatomy and Physiology
ii) Pulmonary Vascularity in Heart Disease
iii) Pulmonary Arterial hypertension/ Its Imaging
iv) MR in Pulmonary Vascular Abnormalities .

3.10 Cadiomyopathy, Cardio Tumors, Trauma :

3.11 The Imaging of Prosthetic Cardiac .Valves :

3.12 The pericardium :

3.13 Thoracic Aorta :

3.14 Interventional Procedures and Heart Disease :

IV .THE GASTROINTESTINAL TRACT:

4.1 The Abdomen: Plain Radiographic findings In acute abdomen

4.1.1 Normal appearances
4.1.2 Abdominal Calcification/Dilatation of bowel/Pneumoperitoneum
4.1.3 The Post Operative Abdomen
4.1.4 Inflammatory Conditions

4.2 The Esophagus

4.2.1 Anatomy .and Functions

4.2.2 Methods of Examination

4.2.3 Pathologies of Esophagus

4.2.4 Motility Disorders

4.2.5 Extrinsic lesions/ miscellaneous conditions

1.3 The stomach

4.3.1 Radiological anatomy and methods of examination

4.3.2 Inflammatory Diseases

4.3.3 Neoplastic Conditions

4.4.4 Radionuchde Studies in Stomach

4.4 The Duodenum

4.4.1 Anatomy and Normal Appearances

4.4.2 Methods of Radiological Examination

4.4.3 Peptic ulceration

4.4.4 Gastro heterotopia /diverticula

4.4.5 Neoplasms benign and malignant -

4.3 The Small Intestine

4.5.1 Anatomy and normal appearances

4.5.2 Methods of radiological examination

4.5.3 Crohns disease/Cóeliac Disease/Neoplasms/various conditions

6 The Large Bowel

4.6.1 Anatomy and Normal Appearances

4.6.2 Methods of Radiological Examination

4.6.3 Tumors

4.6.4 Diverticular.Disease

4.6.5 Colitis

4.6.6 Aids

4.6.7 Miscellaneous Conditions

4.7 Peritoneum, Mesentery and Omentum

4.7.1 Peritoneal spaces and reflections

4.7.2 Abnormalities of Peritoneum

4.7.3 Abnormalities of Mesentry

4.7.4 Abnormalities of greater Omentum

4.8 Gastrointestinal Angiography.

4.8.1 General Consideration

4.8.2 Gastro intestinal bleeding

4.9 Interventionai Radiology in Gastrointestinal tract

4.9.1 Introduction

4.9.2 Esophagus

4.9.3 Stomach and Duodenum

4.9.4 Small Intestine

4.9.5 Colon and Rectum

4.10 Pediatric Gastrointestinal Radiology

4.10.1 The Neonate

4.10.2 The Infant and Older Child

V. Liver, Biliary tract, Pancreas, Endocrine System and Lymphoma

5.1 The Liver

5.1.1 Normal and variant Anatomy

5.1.2 Liver Imaging Techniques

5.1.3 Diffuse Disease

5.1.4 Focal Disease

5.1.5 Intervention

5.2 The Biliary Tract

5.2.1. Anatomic Consideration

5.2.2 Methods of investigation

5.2.3 Biliary Disorders

5.3 Interventional Techniques Hepatobiliary System

5.3.1 Liver Biopsy

5.3.2 Biliary Obstruction

5.3.3 Malignant Biliary Obstruction

5.3.4 Percutaneous Cholangiography and Biliary Drainage Procedures

5.3.5 Vascular Interventional Techniques in Hepatobiliry System

5.4 Radiology of Liver Transplantation

5.4.1 Indications

5.4.2 Pre Transplant Assessment

5.4.3 Radiological Procedures before Transplantation

5.4.4 Post Transplantation Monitoring and Complications

5.5 The Pancreas

5.5.1 Embryology and Anatomy

5.5.2 Congenital Anomalies

5.5.3 Multisystem Diseases with Pancreatic involvement

5.5.4 Pancreatitis

5.5.5 Pancreatic Neoplasms

5.5.6 Trauma

5.5.7 Interventional Radiology in Pancreas

5.6 Imaging of the Endocrine System :

5.6.1 Hypothalamic-Pituitary Axis

5.6.2 Pineal Gland

5.6.3 Thyroid Gland

5.6.4 Parathyroid Gland

5.6.5 Pancreatic & Gastrointestinal Endocrine Disorders

5.6.6 Carcinoid Tumors

5.6.7 Adrenal Glands

5.6.8 Female Reproductive System .

5.6.9 Male Reproductive System

5.7 Reticuloendothelial Disorders : Lymphoma

5.7.1 Epidermilogy

5.7.2 Histopathological Classification

5.7.3 Staging Investigation and Management

5.7.4 Extranodal Manifestation of Lymphoma

5.7.5 Monitoring response to therapy

5.8 Reticuloendothenial Disorders: The Spleen

5.8.1 Imaging Techniques

5.8.2 Normal Anatomy

5.8.3 Splenomegaly

5.8.4 Benign Mass Lesions

5.8.5 Malignant Mass Lesions

5.8.6 Splenic Trauma

5.9 Paediatrics Liver Billary Tract and Spleen :

5.9.1 Techniques

5.9.2 Approach

5.9.3 Liver

5.9.4 Biliary Disease

5.9.5 Spleen

5.10 Paediatrics Endocrine and Bone Density Imaging :

5.10.1 Ultrasound

5.10.2 Nuclear Medicine

5.10.3.Magnetic resonance Imaging

5.10.4 Bone Densitometry in Children

5.11 Neuroblastoma :

VI Genito Urinary Tract :

6.1 Methods of Investigation :

6.2 Radionuclide Imaging in Genito Urinary Tract :

6.3 Urodynamics

6.4 Reno Vascular Disease:

6.4.1 Renal Arteriography

6.4.2 Vascular Abnormalities

6.4.3 Radiological Management of Reno Vascular Disease

6.5 Renal Parenchymal Disease

6.5.1 Normal Appearance

6.5.2 Renal Parenchymal Disease

6.5.3 Parasitic Infections

6.6 Renal Masses :

6.6.1 Methods of Analysis

6.6.2 Pathological Renal Masses

6.3 Neoplastic Renal Masses

6.7 Calculus Disease & Urothelial Lesions

6.7.1 Calculus Disease

6.7.2 Nephrocalcinosis

6.7.3 Urothelial Tumors

6.8 Urinary Obstruction:

6.8.1 Pathophysiology

6.8.2 Causes of Obstruction

6.9 Radiological Evaluation of Urinary Bladder, Prostrate & Urethra :

6.10 Injuries to the Genito Urinary Tract :

6.11 Renal Failure and Transplantation :

6.12 Interventional Uroradiology :

6.13 Imaging of the Kidneys & Urinary Tract in Children

6.13.1 Embryology

6.13.2 Techniques .

6.13.3 Interventional Procedure "

6.14 Imaging of Paediatric Pelvis :

6.14.1 Imaging Techniques :

6.14.2 Normal Anatomy

6.14.3 Congenital Anomalies

6.14.4 Pelvis Masses

6.14.5 Scrotal Disease

VII Skeletal System :

7.1 Skeletal Trauma

7.2 Bone Tumors : Generals Characteristic & Benign Lesions

7.3 Bone Tumors : Malignant Lesions

7.4 Myelproliferative and Similar Disorders

7.4.1 Generalised/Localised Decreased in Bone Density

7.4.2 Generalised/Localised Increased in Bone Density

7.4.3 Delayed Skeletal Matuarity

7.5 Metabolic and Endocrine Disease of the Skeletal

7.6 Skeletal Dysplasias and Malformation Syndrome

7.7 Joints Diseases :

7.7.1 Rhumatiod Arthritis

7.7.2 Other Connective Tissue Disease

7.7.3 Crystal Deposition Arthropathy

7.7.4 Degenerative Joint Disorders/Degenerative spine

7.7.5 Arthrography/ HPOA/ Pachy Dermoperiostritis

7.8 Bone and Soft tissue Infection :

7.9 Imaging of Soft tissue :

7.10 Bone Tumors in Children :

7.10.1 Imaging approach

7.10.2 Benign Bone Tumors

7.10.3 Malignant Bone Tumors

7.11 The Radiology of Non Accidental Injry in Children :

7.12 Paediatric Musculo -Skeletal Trauma

7.13 Radiology of Arthritides in Children

7.14 Radiology of Soft tissue in Children

7.15 Bone and Soft tissue infection in Children.

VIII. The Reproductive System :

8.1 Ultrasound in Obstetrics and Gynaecology

8.1.1 Indication

8.1.2 Instrumentation in US Techniques

8.1.3 Gynecological infertility

8.1.4 Assesing Tubal Patency

8.2 Imaging in Gynaecology

8.3 Hysterosalpingography

8.4 The Breast & its Imaging

8.5 Breast Cancer

8.6 Male Reproductive System

IX Central Nerve System :

9.1 Skull and Brain : Methods of Examination and Anatomy

9.2 Cranial and Intracranial Pathology : Tumors in Adults

9.3 Cranial and Intracranial Pathology : Cerebro Vascular Disease and Non Traumatic Intracranial Haemorrhage

9.4 Cranial and Intracranial Pathology : Infections, AIDS, Demyelinating and Metabolic Disease

9.5 Cranial and intracranial Pathology : Trauma, Bone Pathology, CSF: Disturbances, Epilepsy

9.6 Spine: Method of Investigation

9.7 Imaging of Spinal Pathology

9.8 Scoliosis in Children

9.9 Neonatal Head and Spine Sonography

9.10 Neurology in Children

X. The Orbit; ENT; Face; Teeth:

10.1. The Orbit

10.1.1 Anatomy / Techniques

10.1.2 Intraoccular Abnormalities

10.1.3 Lacrimal Gland Tumors

10.1.4 Muscular Tumors

10.1.5 Intra/Extra Canal Tumors

10.2 Ear, Nose and Throat Radiology

10.2.1 The Ear

10.2.2 Nose and Paranasal Sinuses

10.2.3 Phrynx

10.3. Maxillofacial Radiology

10.3.1 Fractures of Maxilla

10.3.2 TM Joint

10.3.3 Saliváry Glands

10.4. Dental Radiology

10.5. Pediatrics, Eye & Orbit :

10.5.1 Imaging Techniques

10.5.2 Child with Proptosis or an Orbital mass

10.5.3 Child with Orbital Infection

10.5.4 Child with White Eye

10.5.5 Child with Development Abnormalities

10.6. Paediatric ENT Imaging

B. RADIOLOGICAL PHYSICS & X-RAY TECHNOLOGY:

1. Radiation :
2. Production of X -Rays :
3. X- Ray Generators :
4. Basic Interaction between X- Rays and Matter :
5. Attenuation:
6. Filters :
7. X- Ray beam restrictors :
8. Physical characteristics of x- Ray films & film Processing :
9. Photographic characteristics of X- Ray films :
10. Fluroscopic imaging and image intensifier
11. Viewing & recording of the Fluroscopic Image :
12. The Radiographic Image :
13. Geometry of the Radiographic Image :
14. Body section Radiography:
15. Stereoscopy:
16. Xero - Radiography :
17. Computed Tomography:
18. Ultrasound
19. Digital Radiography:
20. Nuclear Magnetic Resonance:
21. Magnetic Resonance Imaging :
22. Radiation hazards & Protection :
23 Electric & Protection :
24. Cine Angiography:
25. Atomic structure, Radioactive Isotopes & Gamma Camera :
26. Positron Emission Tomography:
27. Digital Subtraction Angiography:
28. Catheters, guides wires, dilators, balloons & stents:
29. Pictorial Achieving & Communicating System (PACS) :
30. DICOM :

C. **DARK ROOM TECHNIQUES**

1. Layout of Ideal Dark Room: maintenance and its accessories :

2. Developer: ingredients & their action :

3. Developer: exhaustion & methods of determination :

4. Replenisher & rapid development :

5. Fixer: ingredients & their action :

6. Fixer: exhaustion & methods of determination :

7. Effect of temp on standard development/fixing time & methods to maintain it. :

8. Tropical processing

9. Intensifying screens /construction, types and advantages

10. Rare earth intensifying screens :

11. Intensification factor :

12. Cassette: .construction & care

13. Factors affecting image details :

14. Factors affecting image contrast & density :

15. Grids : construction & types

16. Cones & collimeter :

17. X Ray films -construction, types & storage :

18. Film faults in dark room & their prevention: .

19. Film fog :

20. Hangers:

21. Safe light :

22. Automatic developing unit :

23. Day light loading and unloading of films :

LIST OF TEXTBOOKS AND REFERENCE BOOKS

FOR RADIODIAGNOSIS (MD/DMRD)

1. Textbook of Radiology and Medical. Imaging by David Sutton (international students edition) 7th ed., Churchill Livingstone.
2. Grainger & Allison's Diagnostic Radiology: A Textbook of Medical Imaging. 4th Ed.,2001 Churchill Livingstone, Inc.
3. Davidson's Radiology of the Kidney and Genitourinary Tract, 3rd Ed. WB Saunders 1999.
4. Diagnostic Ultrasound, 2nd edition, by Carol M. Rumack, Stephanie R Wilson J. William Charboneau Mosby Inc.
5. Magnetic Resonance Imaging, 3rd Ed., Stark, David; William, Bradley, Chapt 30. 1919. Mosby
6. Computed Body Tomography with MRI Correlation, 3rd edition loseph K T. Lee Stuart S. Sagel, et al, Lippincott Williams & Wilkins.
7. Textbook of Nuclear Medicine, Wilson MA Philadeiphia Lippincott-Raven Publishers
8. Pediatric Body CT. Marilyn J. Stegle Lippincott Williams, & Williams 1999
9. Essential physics for Radiographers by Chesney Blackwell Scientific Publications Melbourne
10. Positioning in radiography by K. C. Clark Ilford limited William Heinemann Medical books Ltd, London.
11. Radiology of Bone diseases by Greenfield, Lippincott company, Philadelphia and Toronto
12. Analysis of Roentgen sing by Meshan wilsaunders Company.
13. Christenson Curry Basics of Radio- physics
14. Chest Roentgenology by Benjamin\ Felson, WB Saunders Company
15. Diagnosis of Diseases of chest by Fraser Pare's WB Saunders Company
16. Margulis and Burhenne's Alimentary tract Radiology by Frenny and Stevenson, Mosby.
17. Abdominal and General Ultrasound by Davifd Codgrove, Churchill Livingstone.
18. Ultrasonography in Obstetrics and Gynecology by Callen, . WB Saunders.
19. Abdominal-pelvic MRI by Richard C Semelka Wiley-liss Publishers

20. Head and Neck imaging by Petersom, Mosby .

21. Caffey's Paediatric Diagnostic Imaging, Mosby.

22. Interventional Radiology procedure Manual. by MA Braun, Churchill Livingstone.

23. CT and MRI Imaging of whole Body by John Hagga, Mosby.

24. Neuroimaging by William W Orrison, WB Saunder's

25. Annie Osborn's neuroradiology.

26 Breast Imaging by Gilda Cardenosa, Lippincott Willams and Wilkins.

27. MR Imaging of Brain and Spine by scott W. Atlas, Lippincott Williams and Wilkins.

28. Musculoskeletal ultrasound by Marnix T. Van Holsbeeck.

29 Palmer Manual of Diagnosta ulterasound.

30. An Atlas of Signs in Radiology by Eisenberg

31. Clinical application of Doppler ultrasound by K. Taylor, Lippinscott Raven.

32. Dunnick's Textbook of Uroradiology Willams & Willkins, Baltimore.

33. Kirk's Practical Pediatric Imaging. Lippinscott Raven Publishers
(Lippinscott Williams & Wilkins).

LIST OF JOURNALS FOR RADIODIAGNOSIS (MD/DMRD)

1. Indian Journal of Radiology and Imaging.
2. British Journal of Radiology and Imaging.
3. American Journals of Roentgenlogy.
4. American Journals of Neuroradiology.
5. Scandinavian Journal of Radiology and Imaging.
6. Canadian Journal of Radiology.
7. Radiologic Clinics of North America.
8. Medical Imaging International Journal.
9. Asia Pacific Journal of Radiology.
10. ACTA-American Journal of Radiology.
11. Radiology Rounds.

MGM INSTITUTE OF HELATH SCIENCES, NAVI MUMBAI

MARKLIST FOR PRACTICAL AND VIVA-VOCE EXAMINATION

Exam Centre: _____

Date of Examination: _____

EXAMINATION FOR: DIPLOMA IN MEDICAL RADIO DIAGNOSIS (D. M.R.D)

A	Spot Films (30)	60 Marks
B	Long Case (1)	60 marks
C	Short Case (1 Case)	40 Marks
D	Film Reading Session	100 Marks
E	Table Viva / equipments	40 Marks
Total		**300 Marks**

Seat No	Spot Film 60 Marks	Long Case 60 Marks	Short Case 40 Marks	Film Reading Session 100 Marks	Table Viva/ equipments 40 Marks	Total 300 Marks

Name of Examiner	College	Signature with Date

IN PURSUIT OF EXCELLENCE

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M.G.M College of Nursing

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- MGM's Sports Club & Stadium
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- MGM's Health Care Management
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- MGM's Sanskar Vidyalaya (Pri. & Sec. - Mar.)
- MGM's Clover Dale School (Pri. & Sec. - Eng.)
- MGM's First Steps School (Pre-Primary - English)
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- MGM's College of Library & Information Science

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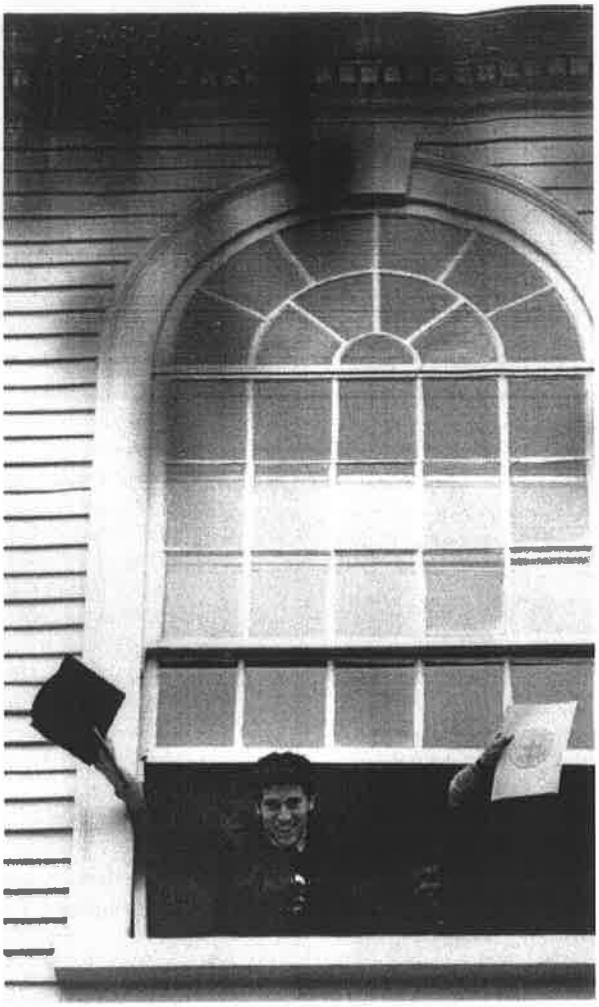

MGM University of Health Sciences
(Education - Health Services - Research)
A Mission started, nurtured and Managed
by Professional Doctors, Scientists Engineers...

MGM INSTITUTE OF HEALTH SCIENCES
(Deemed University u/s 3 of UGC Act, 1956)
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Resolution No. 4.5.4.2 of BOM-55/2018: Resolved to have 10 short notes out of 11 (10 marks each) in all the papers in university examination for PG courses including superspeciality. To be implemented from batch appearing in April/May 2019 examination onwards for MD/MS/Diploma and August/September 2019 examination onwards for superspeciality.

Resolution No. 4.13 of BOM-55/2018: Resolved as follows:-

(i) Slow learners must be re-designated as potential learners.

(ii) Students scoring less than 35% marks in a particular subjects/course in the 1st formative exam are to be listed as potential learners. These learners must be constantly encouraged to perform better with the help of various remedial measures.

(iii) Students scoring more than 75% marks in a particular subjects/course in the 1st formative exam are to be listed as advanced learners. These learners must be constantly encouraged to participate in various scholarly activities.

MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

Grade 'A' Accredited by NAAC

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