LOG BOOK

Doctorate

In Radiodiagnosis

Personal data

- Name: ……
- **Department : ……**
- **Mobile Number:……**
- **E-mail Address: …… ……**

- **Date of registration:** ……/……/……

Signature

Head of the department

Vice Dean for research and postgraduate study

Regulations

Aim of the Logbook:

To provide evidence that the candidate attained the desired level of competence required to gain the award. In this book, the candidate will document all academic and clinical skills he/she attained during their training.

PROGRAM SPECIFICATION
(Doctorate Degree in Diagnostic Radiology)

(B) Professional information

(1) Program Aims:

The broad aims of the Program are as follows:

- Knowledge and understanding of all essential information about imaging and the interventional techniques in the different body organs and systems.
- Acquire all professional skills that enable them to efficiently practice both diagnostic and interventional radiology using different imaging modalities.
- Be aware of all needs for life learning of the medical profession; communication skills and effective contributions to research teamwork.

(2) Intended Learning Outcomes (ILOs):

On successful completion of the program, the candidate will be able to:

A- Knowledge and Understanding:

A1. Describe the physics and technical principles of the different imaging modalities.

A2. Identify the recent technical innovations in different imaging modalities and explain how to apply them to reach a final diagnosis.

A.3 Demonstrate the anatomy of the different parts of the body in the different imaging modalities.

A4. Classify and describe the etiology, pathogenesis and clinical features of the different pathological diseases that affect the different body regions and correlate them with their radiologic appearances.

A5. Differentiate between the appearances of the pathological conditions on the different imaging modalities and describe them efficiently in the case reports by all means: written oral and radiologic.

A6. List the interventional radiologic procedures in different body systems: biliary and vascular embolization procedures.

A7. Name the suitable interventional instruments (catheters and cannulas) and embolizing material.

A8. Radiologic approach to emergency medicine and life threatening illnesses; non invasive and invasive intervention and pre and postoperative follow up.

A9. Participate in public health services and screening programs e.g. mammography for breast cancer screening.

A10. Review how to conduct efficiently and independently the assigned research issue.

A11. Identify radiation safety and protection measures.

A12. Explain the value of enhancing patient safety & standardization of CT contrast media practice.

A13. Identify the national code of ethics, medico-legal aspects, malpractice and common medical mistakes.

B- Intellectual skills:

B1. Integrate clinical information with radiological interpretation to reach the appropriate diagnosis/ differential diagnosis.

B2. Construct an algorithmic approach to any organ system pathology and follow it step by step ending with sonographic/CT guided biopsy taking and pathologic assessment.

B3. Design the initial course of management for critical emergencies and traumatized cases.
B4. Cooperate with the referring physician by all means to reach the proper treatment decision for the patient.
B5. Enhance leadership capabilities required for conducting a teamwork aim to achieve a certain research subject.
B6. Assemble available human and equipment resources in the field of study to achieve the search goals in a given time scale.
B7. Express ideas and scientific arguments in case reporting and problem solving debates.

C-Professional/practical skills:

C1. Use of the technical refinements in each imaging modality in order to establish the diagnosis with the highest accuracy and in the shortest time.
C2. Use the contrast media and the isotopes in the optimal way regarding the dose and the time.
C3. Provide the maximum protective measures to avoid the risks of radiation on the patients, workers and visitors.
C4. Provide the first aid measures for patients who develop hypersensitivity reaction or any life-threatening clinical attack while performing the examination
C5. Cooperate with colleagues, various health and social care professionals.
C6. Recognize limitations in knowledge and equipment and refer patients to an appropriately equipped facility.
C7. Perform the essential basic radiologic interventional procedures e.g US/CT guided biopsies.

D- Communication & Transferable skills

D1. Use the different computer programs in the different units of the diagnostic radiology department and communicate efficiently with medical staff of other deparments.
D2. Retrieve, manage and manipulate information by all means, including electronic means to regularly updated with the recent technical innovations.

D3. Present information clearly in the form of written radiology reports, electronic and oral forms.
D4. Attend interactive case study sessions and express ideas and effective arguments about debatable cases.
D5. Work efficiently within a team work to reach the goal of a research.
D6. Analyze and use numerical data (including the use of simple statistical methods) to assess the results of a number of case studies and assess the efficiency of a certain imaging modality in the radiologic characterization of a certain organ disease.

(3) Academic standards:

3. a- External reference points/benchmarks are selected to confirm the appropriateness of the objectives, and ILOs. We follow ILOs recommended ARS of Mansoura faculty of medicine.

3. b- Comparison of the specification to the selected external reference/ benchmark:

Our department is estimated to cover 85% of ILOs.

Methods:
We are developing or methodology to fully cover learning requirements, e.g. E-learning methods, researches assignment and upgrading our teaching tools and equipment.
1. PPT lectures.
2. E learning methods.
3. Self learning, problem solving and case presentation.
4. Research assignment**.**

4) Curriculum structure and contents:

4.a- Duration of the program: 42 months.
4.b- program structure:

- **First semester lectures**

12 credit hours (2 for advanced radiological &clinical physics &radiation protection, 2 for advanced interventional radiology, 2 for advanced medical statistics ,2 for advanced research methodology, 2 for medical education, 1 for advanced computer course for medical sciences, 1 for language [TOEFL/IELTS])

- **Second, third and fourth semesters lectures:**

18 credit hours (5 for advanced abdominal, pelvic and women imaging, 3 for advanced chest and cardio-vascular radiology, 3 for advanced musculoskeletal radiology, 5 for advanced neuro and head and neck imaging, and 2 for advanced artificial intelligence)

- **Fifth semester:**
  - 2 credit hours for the elective course

    Choose one between:

    1-Recent advances in neuroradiology.

    2-Recent advances in cardiac imaging.

    3-Recent advances in vascular imaging.
  - 8 credit hours for advanced applied practical and clinical radiology .
- **Sith and seventh semester: Thesis and subspeciality training.**

Thesis: 20 credit hours (distributed from second to the seventh semester)

(4) Program admission requirements:

- **General requirements:**

By laws regulating post graduate Studies.

- **Specific requirements (if applicable).**

(5) Resident Training Program

(Basic Training Program)

Phase (I) (first ye

A- Radiological training.

B- Basic science teaching.

C- Basic radiology knowledge.

Phase (II) (second year):

A- Radiological training.
B- Thesis (MD).
C- Knowledge expansion.

Phase (III) (third year):

A- Radiological training.
B- Thesis (MD).
C- Knowledge expansion.
D- Applied practical and clinical examination

Phase (IV) (fourth year):

A- Radiological training.
B- Thesis (MD).
C- Knowledge expansion.

(6) Regulations for progression and program completion:

(All documented in the logbook)

First semester:

- **Minimally accepted attendance of lectures is 70%**
- **Attending MCQ exam.**

Second, third and fourth semesters:

1- Attendance Criteria:

- Minimally accepted attendance in lectures is 70%.

- Attending MCQ exam after each semester

2-Scientific activities:

For attending

- **Conferences**
- **thesis discussions**
- **meetings**

3-Practical work:

- Radiology training:

Rotations in radiology dpt. and radiology units in different hospitals according to the schedule determined by the supervisors.

-On-call Duties:

Residents are assigned to appropriate on-call duties according to a prearranged department schedule.

Radiology units in all Mansoura University Hospitals and centers where radiology training is held include:

1) **Mansoura University Hospitals which includes:**
    a) **Woman Imaging Unit**
    b) **Out-patient ultrasound unit**
    c) **In-patient ultrasound unit**
    d) **Doppler Unit**
    e) **X-Ray Unit**
    f) **Angiography Unit.**
    g) **PET/CT unit**
    h) **PACS Reporting units (CT & MRI) which include:**
        - **Neuroradiology& Head and Neck PACS Unit.**
        - **Abdomen and pelvis (GIT & GU) PACS unit.**
        - **Musculoskeletal PACS Unit**
        - **Cardio-Thoracic PACS Unit**
2) **Emergency Hospital**
3) **Specialized Medical Hospital**
4) **Children's Hospital**
5) **Gastro-intestinal Surgery Center**
6) **Oncology Center**
7) **The New Three Medical Centers (Neurology, Neurosurgery Center, Orthopedic Center, and Obstetrics and Gynecology Center**

Fifth semester:

- Minimally accepted attendance in lectures is 70%.

- Attending MCQ exam after each semester

Sixth and Seventh semesters:

-Success in thesis and publishing a paper with related Topic in international Journal.

(7) Doctorate degree Examination Syllabus:

First semester:

1. **Advanced Medical statistics:**
   - **Final exam (60 degrees) (1 hour).**
2. **Advanced Research methodology:**
   - **Final exam (60 degrees) (1 hour).**
3. **Advanced Ethics and medical responsibilities:**
   - **Final exam (60 degrees) (1 hour).**
4. **Advanced computers for medical sciences**
5. **Language**
6. **Advanced radiological &clinical physics &radiation protection:**
   - **Semester exam (20 degrees).**
   - **Final exam (80 degrees) (1.5 hours)**
7. **Advanced Interventional Radiology:**
   - **Semester exam (20 degrees).**
   - **Final exam (80 degrees) (1.5 hours).**

Second, third and fourth semesters:

1. **Advanced abdominal, pelvic and women imaging:**
   - **Semester exam (40 degrees)**
   - **Final exam (160 degrees) (3 hours)**

2. **Advanced chest and cardio-vascular radiology:**
    - **Semester exam (20 degrees).**
    - **Final exam (80 degrees) (1.5 hours).**
3. **Advanced musculoskeletal radiology:**
    - **Semester exam (20 degrees).**
    - **Final exam (80 degrees) (1.5 hours).**
4. **Advanced neuro and head and neck imaging:**
    - **Semester exam (40 degrees)**
    - **Final exam (160 degrees) (3 hours)**
5. **Advanced artificial intelligence:**
    - **Semester exam (20 degrees).**
    - **Final exam (80 degrees) (1.5 hours).**

Fifth semester:

1. **Elective course**

(Choosing between recent advances in neuroradiology, recent advances in cardiac imaging and recent advances in vascular imaging)

- **Semester exam (20 degrees)**
- **Final exam (80 degrees) (1.5 hours)**

2. **Advanced applied practical and clinical radiology course:**
    - **Semester exam (100 degrees)**
    - **Final exam (400 degrees).**

Sixth and seventh semesters:

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(8) Certification

- Certificates of training completion will only be issued upon the trainer's Successful completion of all program requirements. Candidates passing all components of the final examination are awarded the "Doctorate degree" certificate.

For more information about Radiology Department at Mansoura University please visit our website ***https://medfac.mans.edu.eg/index.php/en/home-radiology*** or scan the QR Code:

Scan QR Code

Contents

Section 1:-

A. Clinical rotations (schedule duties)

1st year: from…… To ……

2nd year: from…… To ……

3rd year: from…… To ……

4th year: from…… To ……

1st year:

	Month	Site of attendance	Modality	No of cases	Trainer's signature
1st month					
2nd month					
3rd month					
4th month					
5th month					
6th month					
7th month					
8th month					
9th month					
10th month					
11th month					
12th month					

Signature of head of the section ***Signature of head of the department***

2nd year:

	Month	Site of attendance	Modality	No of cases	Trainer's signature
1st month					
2nd month					
3rd month					
4th month					
5th month					
6th month					
7th month					
8th month					
9th month					
10th month					
11th month					
12th month					

Signature of head of the section ***Signature of head of the department***

3rd year:

	Month	Site of attendance	Modality	No of cases	Trainer's signature
1st month					
2nd month					
3rd month					
4th month					
5th month					
6th month					
7th month					
8th month					
9th month					
10th month					
11th month					
12th month					

Signature of head of the section ***Signature of head of the department***

4th year:

	Month	Site of attendance	Modality	No of cases	Trainer's signature
1st month					
2nd month					
3rd month					
4th month					
5th month					
6th month					
7th month					
8th month					
9th month					
10th month					
11th month					
12th month					

Signature of head of the section ***Signature of head of the department***

B. On Call Duties

Item	Year 1	Year 2	Year 3	Year 4
The average number of on-call duties per month				
Attendance and availability				
Interaction with referring staff				
Interactions with technologists				
Accuracy of findings and reports				
Appropriate utilization of seniors				
Active supervision of juniors				

- **Good (*)**
- **Very good (**)**
- **Excellent (***)**

Section 2:-

Clinical Radiology Training Courses:

A. Sites of radiology training.

B. Courses of radiology training.

A- Sites of radiology training

Type of training course	Core sites of training	Available modalities in site of training
Neuroradiology	• Mansoura University Hospital • The New Three Medical Centers • Mansoura Children Hospital	CT MRI
Head and neck radiology	• Mansoura University Hospital ○ Mansoura Children Hospital	US CT MRI
Gastro-intestinal radiology	• Gastro-Intestinal Surgery Center • Specialized Medical Hospital • Mansoura University Hospital.	X-ray Fluoroscopy US CT MRI
Genito-urinary radiology	• Mansoura University Hospital	X-ray Fluoroscopy US CT MRI
Gynecological and obstetric radiology	• Mansoura University Hospital • The New Three Medical Centers	HSG US (2D, 3D) CT MRI
Breast radiology	▪ Mansoura University Hospital ▪ Oncology Center. • Female Imaging Unit in Mansoura University Hospital	US Mammography Tomosynthesis MRI
Musculoskeletal radiology	• Mansoura University Hospital • The New Three Medical Centers	X-ray CT MRI
Chest radiology	○ Mansoura University Hospital • Specialized Medical Hospital ○ Mansoura Children Hospital	X-ray CT MRI
Cardiac radiology	• Mansoura University Hospital • Mansoura Children Hospital • The New Three Medical Centers (Neurology, Neurosurgery Center, Orthopedic Center, and Obstetrics and Gynecology Center)	CT MRI

Vascular and interventional radiology	• Mansoura University Hospital (Doppler Unit) (PACS Unit) (Angiography Unit). • Specialized Medical Hospital. • Gastro-intestinal Surgery Center.	Doppler US CT MRI DSA
Nuclear radiology	• Oncology Center.	PET/CT
Oncology radiology	• Oncology Center. • Mansoura University Hospital	US CT MRI
Pediatric radiology	• Mansoura Children Hospital.	X-ray Fluoroscopy US CT MRI
Emergency radiology	• Emergency Hospital	US X ray CT

B-Courses of radiology training:

1-Neuroradiology course

Content:

I –Targets

II –Reporting Skills

III- Clinical and practical skills.

IV-Worklist

I- Targets		Level Achieved			
		1	2	3	4
Core knowledge & Skills					
1	Understand detailed and complex neurological imaging anatomy				
2	Understanding of the advanced CT and MRI physics and techniques related to neuroimaging, e.g., perfusion, tractography, spectroscopy, etc.				
3	Demonstrate a basic understanding of the indications for and the techniques and risks of cerebral and spinal angiography.				
4	Understand usual and unusual imaging findings and manage the common neurological problems				
5	Correlate imaging findings with clinical data and other imaging data and generate appropriate lists of differential diagnoses.				
6	Recognize and recommend the most appropriate next step during management.				
7	Correlate imaging findings with clinical data and other imaging data and generate appropriate lists of differential diagnoses.				
8	perform advanced post-processing of vascular, volumetric, and functional neuro-CT and MRI studies.				
9	Report and demonstrate a basic understanding of MR angiography and venography of the cerebral vascular system.				
10	Report and demonstrate a basic understanding of CT angiography and venography of the cerebral vascular system.				
11	Performing and reporting transcranial ultrasound.				
Extended experience					
1	Performing and reporting myelogram.				

Level 1: The trainee has a comprehensive understanding of the principles of the procedure including, where applicable, complications and interpretation of the results and has witnessed the procedure being performed.

Level 2: The trainee is able to carry out the procedure under direct supervision.

Level 3: The trainee is able to carry out the procedure under indirect supervision.

Level 4: The trainee is able to carry out the procedure competently and independently (independent competence)

II - Reporting Skills (neuro)				
Diagnosis of the case	**Total number of cases**	**No. of cases to carry out as an observer (O)**	**No. of cases to carry out under supervision (S)**	**No. of cases to carry out independently (I)**
Congenital Malformations	**81**	**14**	**31**	**36**
Chiari: 1 , 2, & 3				
Callosal Dysgenesis				
Lipoma				
Dandy Walker Spectrum				
Congenital Vermian Hypoplasia				
Holoprosencephaly				
Septooptic Dysplasia				
Microcephaly				
Heterotopic Gray Matter				
Pachygyria -Polymicrogyria				
Lissencephaly Type 1				
Schizencephaly				
Hemimegalencephaly				
Familial Tumor/Neurocutaneous Syndromes	**28**	**8**	**10**	**10**
Neurofibromatosis Type 1				
Neurofibromatosis Type 2				

Von Hippel Lindau				
Tuberous Sclerosis Complex				
Sturge- Weber Syndrome				
CNS TRAUMA	**81**	**19**	**28**	**34**
Missile and Penetrating Injury				
Epidural Hematoma				
Subdural Hematoma				
Traumatic Subarachnoid Hemorrhage				
Cerebral Contusion				
Diffuse Axonal Injury (DAI)				
Secondary/Vascular Effects of CNS Trauma	**20**	**7**	**7**	**6**
Intracranial Herniation Syndromes				
Traumatic Cerebral Edema				
Traumatic Cerebral Ischemia				
Brain Death				
Traumatic Carotid-Cavernous Fistula				
STROKE:	**62**	**7**	**30**	**25**

Subarachnoid Hemorrhage				
Intracerebral Hemorrhage				
Intraventricular Hemorrhage				
Nonatheromatous Vasculopathy	**18**	**7**	**6**	**5**
Persistent Trigeminal Artery				
Moyamoya				
Vasculitis				
CADASIL				
Cerebral Ischemia and Infarction	**100**	**26**	**36**	**40**
Hydranencephaly				
HIE				
Cerebral Ischemia-Infarction				
Venous Thrombosis				
Vascular Malformations	**32**	**11**	**11**	**10**
Aneurysms				
Arteriovenous Malformation				
Dural A-V Fistula				
Vein of Galen Malformation				
Developmental Venous Anomaly				
Cavernous Malformation				

Venous Angioma				
<u>Neoplastic & tumor like lesions of the brain and skull base:</u>	**70**	**25**	**25**	**20**
Astrocytic Tumors-Infiltrating				
Low Grade				
Glioblastoma Multiforme				
Gliomatosis Cerebri				
Astrocytic Tumors-localized				
Pilocytic Astrocytoma				
Pleomorphic Xanthoastrocytoma				
Subependymal Giant Cell Astrocytoma				
Oligodendroglioma				
Ependymoma				
Choroid Plexus Papilloma/ Carcinoma				
Ganglioglioma				
DNET				
Central Neurocytoma				
Pineal Tumors				
Embryonal and Neuroblastic Tumors				
Medulloblastoma (PNET-MB)				
Supratentorial PNET				

Tumors of Cranial/Peripheral Nerves				
Schwannoma & Neurofibroma				
Blood Vessel and Hemopoietic Tumors				
Hemangioblastoma				
Primary CNS Lymphoma				
Germ Cell Tumors				
Metastatic Tumors				
Primary Non-Neoplastic Cysts	**28**	**11**	**9**	**8**
Arachnoid Cyst				
Colloid Cyst				
Epidermoid Cyst				
Neuroglial Cyst				
Enlarged Perivascular Spaces				
Porencephalic Cyst				
Neurenteric Cyst				
Infections:	**30**	**12**	**10**	**8**
Congenital/Neonatal Infections				
Acquired Infections				
Meningitis				
Abscess				
Ventriculitis				

Empyema				
Encephalitis				
Tuberculosis				
Parasites & Fungal Diseases				
Demyelinating Disease	**22**	**12**	**11**	**9**
Multiple Sclerosis				
ADEM				
Mitochondrial Disorders				
Leigh Syndrome				
Lysosomal Disorders				
Mucopolysaccharidoses				
Metachromatic Leukodystrophy (MLD)				
Peroxisomal Disorders				
X-Linked Adrenoleukodystrophy				
Organic and Aminoacidopathies				
Maple Syrup Urine Disease				
Canavan Disease				
Alexander Disease				
Miscellaneous				
Wilson Disease				

Toxic, Metabolic, Nutritional, Systemic Diseases with CNS	**29**	**14**	**7**	**8**
Manifestations (acquired).				
Hypoglycemia				
Kernicterus				
Drug Abuse				
Hypothyroidism				
Fahr Disease				
Alcoholic Encephalopathy				
Hepatic Encephalopathy				
Acute Hypertensive Encephalopathy, PRES, Chronic Hypertensive Encephalopathy Idiopathic Intracranial Hypertension				
CO Poisoning				
Osmotic Demyelination Syndrome				
Radiation and Chemotherapy				
Mesial Temporal Sclerosis, Status Epilepticus				
Dementias and Degenerative Disorders	**10**	**4**	**2**	**4**
Aging Brain				
Parkinson Disease				

Amyotrophic Lateral Sclerosis (ALS)				
Wallerian Degeneration				
Ventricles & Cisterns:	**24**	**8**	**8**	**8**
Hydrocephalus				
Obstructive Hydrocephalus				
Normal Pressure Hydrocephalus				
CSF Shunts and Complications				
III –Clinical and practical Skills:				
Transfontanellar US	**20**		**5**	**15**
Cerebral DSA	**6**	**5**	**1**	**-**
Advanced techniques	**7**	**5**	**5**	**1**
DW1 and ADC map processing and reporting				
DTI processing and reporting				
MRS processing and reporting				
MR perfusion processing and reporting				
CSF flowmetry processing and reporting				

Signature of head of the section ***Signature of head of the department***

II - Reporting Skills (spine):				
Diagnosis of the case	**Total number of cases**	**No. of cases to carry out as an observer (O)**	**No. of cases to carry out under supervision (S)**	**No. of cases to carry out independently (I)**
Congenital and Developmental Disorders	**55**	**21**	**20**	**14**
Abnormalities of Neurulation				
Chiari Malformation				
Myelomeningocele				
Spinal Lipoma				
Posterior Element Incomplete Fusion				
Dermoid and Epidermoid Tumors				
Anomalies of the Caudal Cell Mass				
Caudal Regression Syndrome				
Tethered Spinal Cord				
Sacrococcygeal Teratoma				
Anomalies of Notochord Development				
Diastematomyelia				
Neurenteric Cyst				
Anomalies of Vertebral Formation and Segmentation				

Failure of Vertebral Formation				
Klippel-Feil Spectrum				
Normal Anatomical Variations				
Craniovertebral Junction Variants				
Congenital and Developmental Abnormalities				
Neurofibromatosis Type 1				
Neurofibromatosis Type 2				
Congenital Spinal Stenosis				
Scoliosis				
Kyphosis				
Schmorl Node				
Scheuermann Disease				
SpinalTrauma	**27**	**11**	**9**	**7**
Atlanto-Occipital Dislocation				
Spinal fractures				
Post-Traumatic Syrinx				
Spinal Cord Contusion-Hematoma				
Central Spinal Cord Syndrome				
Spinal Cord Herniation				
Lumbar Fracture with Dural Tear				
Epidural-Subdural Hematoma				

Degenerative Diseases	**106**	**53**	**53**	**53**
Degenerative Disc Disease				
Degenerative Endplate Changes				
Intervertebral Disc Herniation Cervical, Thoracic and Lumbar				
Spondylolisthesis				
Spondylolysis				
Facet Arthropathy, Cervical, Lumbar				
Acquired Spinal Stenosis, Lumbar, Cervical				
Degenerative Scoliosis				
DISH				
OPLL				
Infections	**19**	**4**	**5**	**10**
spondylodiscitis				
Epidural Abscess				
Paraspinal Abscess				
Inflammatory & Autoimmune	**19**	**9**	**7**	**3**
Spinal Meningitis				
Parasitic				
Guillain-Barre Syndrome				
Arachnoiditis				
Multiple Sclerosis, Spinal Cord				

Idiopathic Acute Transverse Myelitis				
Vitamin B12 Deficiency, Spinal Cord				
Neoplasms, Cysts, and Other Masses	**77**	**26**	**28**	**23**
Neoplasms				
Extradural				
Osseous Metastases				
Hemangioma				
Chordoma				
Lymphoma				
Multiple Myeloma				
Intradural Extramedullary				
Meningioma				
Hemangiopericytoma				
Schwannoma & Neurofibroma				
CSF Disseminated Metastases				
Intramedullary				
Astrocytoma, Spinal Cord				
Ependymoma Spinal Cord				
Hemangioblastoma, Spinal Cord				
Non-Neoplastic Cysts				
Arachnoid Cyst				

Perineural Root Sleeve Cyst				
Syringomyelia				
Non-Neoplastic Masses and Tumor Mimics				
Epidural Lipomatosis				
Heterogeneous Fatty Marrow				
Langerhans Cell Histiocytosis				
Vascular lesions	**2**	**1**	**1**	**-**
Vascular malformation				
Plexus & Peripheral Nerve lesions	**4**	**4**	**-**	**-**
Brachial Plexus Traction Injury				
Traumatic Neuroma				
Thoracic Outlet Syndrome				
Peripheral Nerve Tumor				
Post-Operative and Post-Procedural Imaging and Complications	**26**	**9**	**8**	**9**
Hardware Failure				
CSF Leakage Syndrome				
Post-Operative Infection				
Recurrent Vertebral Disc Herniation				
Post-Operative fibrosis				

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IV-Work list:

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

2-Head and neck radiology course

Content:

I –Targets
II –Reporting Skills
III- Clinical and practical skills.
IV-Worklist

I- Targets		Level Achieved			
		1	2	3	4
Core knowledge & Skills					
1	Knowledge of head and neck anatomy and clinical practice relevant to clinical radiology.				
2	Knowledge of the manifestations of ENT/dental disease as demonstrated by conventional radiography, relevant contrast examinations, ultrasound, CT and MRI.				
3	Awareness of the application of ultrasound with particular reference to the thyroid, salivary glands and other neck structures.				
4	Awareness of the application of radionuclide investigations with particular reference to the thyroid and parathyroid glands.				
5	Familiarity with advanced CT and MRI techniques in head and neck				
6	Reporting plain radiographs performed to show ENT/dental disease.				
7	Performing and reporting relevant contrast examinations (e.g. barium studies, including video swallows, and sialography).				
8	Performing and reporting ultrasound of the neck (including the thyroid, parathyroid and salivary glands).				
9	Reporting CT & MRI of the head and neck for ENT problems.				
10	Reporting CT & MRI of the orbital problems.				
11	Perform biopsies of neck masses (thyroid, lymph nodes etc.).				
12	Reporting CT& MRI of congenital anomalies of the ear.				
Extended experience					
1	Observation or experience in performing ultrasound of the eye.				
2	Performing and reporting of sialograph				

Level 1: The trainee has a comprehensive understanding of the principles of the procedure including, where applicable, complications and interpretation of the results and has witnessed the procedure being performed.
Level 2: The trainee is able to carry out the procedure under direct supervision.
Level 3: The trainee is able to carry out the procedure under indirect supervision.
Level 4: The trainee is able to carry out the procedure competently and independently (independent competence).

II –Reporting Skills:				
Diagnosis of the case	**Total number of required cases**	**No. of cases to carry out as an observer (O)**	**No. of cases to carry out under supervision (S)**	**No. of cases to carry out independently (I)**
Neck spaces:	**24**	**5**	**5**	**14**
Congenital: Branchial cleft cyst Type 1 Type2 Dermoid / epidermoid cyst Hemangioma Cystic hygroma				
Inflammatory:	**50**	**10**	**10**	**30**
Neck space abscess Adenoid Inflammatory LNs				
Degenerative:	**6**	**1**	**1**	**4**
Ranula				
Neoplastic:	**97**	**20**	**20**	**57**
Lipoma Nasopharyngeal carcinoma Carotid body tumor Paraganglioma Schwannoma Mixed salivary gland tumors Warthin tumor Malignant parotid mass Lymphadenopathy: Lymphoma Metastatic Tongue cancer				

Orbit:	**36**	**10**	**10**	**16**
Congenital: Dermoid / epidermoid cyst Orbital NF1				
Traumatic: Blow out fracture				
Inflammatory: Cellulitis Pseudo-tumors				
Degenerative: Thyroid ophthalmopathy				
Neoplastic: Optic nerve meningioma Optic pathway glioma Hemangioma				
Larynx:	**72**	**20**	**20**	**32**
Degenerative: Laryngocele				
Neoplastic: Glottic carcinoma Supraglottic Trans glottic carcinoma Hypopharyngeal carcinoma Post cricoid carcinoma				
PNS:	**91**	**20**	**20**	**51**
Congenital: Choanal atresia				
Traumatic: Facial fracture				
Inflammatory: Sinusitis Sino nasal polyposis Fungal sinusitis Antrochoanal polyps				
Neoplastic: Sino nasal osteoma Sino nasal malignant mass				

Petrous:	**53**	**10**	**10**	**33**
Congenital: Inner ear anomaly				
Traumatic: Petrous fracture				
Inflammatory: Chronic oto mastoiditis Cholesteatoma Malignant otitis externa				
Neoplastic: Glomus jugular Vestibular schwannoma				
Mandible:	**26**	**5**	**5**	**16**
Congenital: Dentigerous cyst Fibrous dysplasia				
Traumatic: Mandible fracture				
Inflammatory: Radicular cysts				
Neoplastic: Ameloblastoma				
Thyroid:	**34**	**10**	**10**	**14**
Congenital: Ectopic thyroid				
Inflammatory: Thyroiditis				
Neoplastic: Thyroid neoplastic mass				
III –Clinical and practical Skills:				
skills	**40**	**1**	**11**	**33**
Thyroid US	**20**	**-**	**5**	**15**

Neck US	**20**	**-**	**5**	**15**
LN Biopsy	**5**	**1**	**1**	**3**

Signature of head of the section ***Signature of head of the department***

IV-Work list:

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

3-Gastrointestinal radiology course

Content:

I –Targets

II –Reporting Skills

III- Clinical and practical skills.

IV-Worklist

I- Targets		Level Achieved			
		1	2	3	4
Core knowledge & skills					
1	Knowledge of gastrointestinal and biliary anatomy and clinical practice relevant to diagnostic radiology.				
2	Knowledge of the radiological manifestations of disease within the abdomen on conventional radiography, contrast studies, ultrasound, CT, MRI, radionuclide investigations and angiography.				
3	Knowledge of the applications, contraindications and complications of relevant interventional procedures.				
4	Recognize the recent technical innovations in different imaging modalities and learn how to apply them to reach a final diagnosis.				
5	Radiologic approach to emergency medicine and life threatening illnesses e.g. bleeding and acute intestinal obstruction; non invasive and invasive intervention and pre and postoperative follow up.				
6	Performing and reporting the following contrast examinations: - Swallow and meal examinations - Small bowel studies - Enema examinations				
7	Performing and reporting transabdominal ultrasound of the gastrointestinal system and abdominal viscera.				
8	Supervising and reporting computed tomography of the abdomen.				
9	Supervising and reporting different MRI studies of the abdomen (including dynamic MRI, MRCP, etc.)				
10	Supervising and reporting MRI Fistulogram of peri-anal fistula.				
11	Supervising and reporting CT enterography , MR enterography and virtual colonoscopy.				
12	Familiarity with the post-processing and application of new CT and MRI techniques of the abdomen.				
13	Performing: - Ultrasound guided biopsy and drainage. - Computed tomography guided biopsy and drainage.				
Core experience					
1					

	Experience of performing and reporting the following contrast medium studies: - Sialo-gram - Fistulo-gram - Sinogram. - GI video studies.				
2	Experience of the manifestations of abdominal disease on MRI with particular reference to the solid viscera.				
3	Experience of the current application of the radionuclide investigations of the gastrointestinal tract in the following areas: - Liver. - Biliary system. - Gastrointestinal bleeding. - Abscess localization. - Assessment of inflammatory bowel disease.				
4	Experience of the application of angiography and vascular interventional techniques to this subspecialty.				
5	Experience of the relevant application of the following interventional procedures: - Percutaneous biliary stenting.				
Extended experience					
1	Observation of ERCP and other diagnostic and therapeutic endoscopic techniques.				
2	Endoluminal ultrasound.				
3	Performing T-tube cholangiography.				
4	Performing percutaneous cholangiography.				

Level 1: The trainee has a comprehensive understanding of the principles of the procedure including, where applicable, complications and interpretation of the results and has witnessed the procedure being performed.
Level 2: The trainee is able to carry out the procedure under direct supervision.
Level 3: The trainee is able to carry out the procedure under indirect supervision.
Level 4: The trainee is able to carry out the procedure competently and independently (independent competence).

II –Reporting Skills:				
Name of the case	**Total number of required cases**	**No. of cases to carry out as an observer (O)**	**No. of cases to carry out under supervision (S)**	**No. of cases to carry out independently (I)**
Congenital:	**80**	**10**	**10**	**60**
Hypertrophic pyloric stenosis				
Congenital gastric diverticulum				
-Duodenal atresia				
Duodenal diverticulum				
Duplication cyst				
Intestinal Malrotation				
Meckel diverticulum				
Ano rectal malformation				
Hirshsprung disease				
Polysplenia and asplenia				
Choledochal cyst				
Caroli disease				
Pancreatic agenesis				
Annular pancreas				

Tumors:	1200	100	100	1000
Gastric carcinoma				
Gastric lymphoma				
Gastric GIST				
Intestinal carcinoma				
Intestinal lymphoma				
Colonic adenocarcinoma				
Esophageal carcinoma				
Esophageal leiomyoma				
GB carcinoma				
Cholangiocarcinoma				
Hemangioma				
Focal nodular hyperplasia				
Hepatic adenoma				
Fibrolamellar HCC				
HCC				
Pancreatic neuroendocrine tumor				
Pancreatic adenocarcinoma				
Splenic lymphoma				

Vascular lesions:	**250**	**25**	**25**	**200**
Esophageal varices				
SMA syndrome				
Splenic infarction				
Ischemic colitis				
Hepatic infarction				
Bud chiarri malformation				
Portal vein thrombosis				
Veno occlusive disease				
Inflammation:	**600**	**100**	**100**	**400**
Reflux esophagitis				
Barrett esophagus				
Caustic esophagitis				
Candida esophagitis				
Gastritis				
Gastric ulcer				
zollinger-Ellison syndrome				
Duodenitis and Duodenal ulcer				
Whipple disease				

-Celiac disease				
Chrons				
Hepatitis				
Hepatic abscess				
Splenic abscess				
Pancreatitis				
Ulcerative colitis				
Diverticulitis				
Appendicitis				
Calcular cholecystitis				
Non calcular cholecystitis				
GB empyema				
Mirizzi syndrome				
Xanthogranulomatous cholecystitis				
Ascending cholangitis				
Traumatic lesions	**60**	**-**	**10**	**50**
Esophageal foreign body				
Esophageal perforation				
Hepatic trauma				
Splenic trauma				
Pancreatic trauma				
Other lesions:	**150**	**-**	**20**	**130**
Zenker diverticulum				
Sigmoid volvulus				
Caecal volvulus				
intussusception				
Bowel obstruction				
Gall stone ileus				
Esophageal webs				

Esophageal achalasia				
Esophageal motility disorder				
Esophageal scleroderma				
III –Clinical and practical Skills				
Abdominal US	**400**	**-**	**-**	**400**
Barium studies:	**600**	**-**	**200**	**400**
Barium swallow				
Barium meal				
Barium follow-through				
Barium enema				
Defecography				
Sialography				
Sino/ Fistulography				
Interventional Techniques:	**100**	**-**	**20**	**80**
US guided biopsy				

CT guided biopsy				
US guided collection drainage				
Trans-arterial chemoembolization of hepatic focal lesion				
Performing T-tube cholangiography.				
Performing percutaneous cholangiography.				
Percutaneous biliary stenting.				
US guided aspiration of ascetic fluid				
US guided Paracentesis				

Signature of head of the section ***Signature of head of the department***

VI-Work list:

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

4-Genito urinary radiology course

Content:

I –Targets
II –Reporting Skills
III- Clinical and practical skills.
IV-Worklist

I- Targets		Level Achieved			
		1	2	3	4
Core knowledge & skills					
1	Knowledge of urinary tract anatomy and clinical practice relevant to diagnostic radiology.				
2	Knowledge of the manifestations of urological disease as demonstrated on conventional radiography, ultrasound, CT and MRI.				
3	Awareness of the application of angiography and vascular interventional techniques.				
4	Reporting plain radiographs performed to show urinary tract disease.				
5	Reporting the following contrast studies:				
	- Intravenous urogram				
	- Retrograde pyelo-ureterography				
	- Loopogram				
	- Nephrostogram				
	- Ascending urethrogram				
	- Micturating cysto-urethrogram				
6	Performing and reporting transabdominal ultrasound to image the urinary tract.				
7	Reporting computed tomography of the urinary tract.				
8	Reporting radionuclide investigations of the urinary tract in the following areas:				
	- Kidney				
	- Renal function				
	- Vesico-ureteric reflux				
Extended experience					
1	Observation of endorectal ultrasound.				
2	Performing image-guided renal biopsy under US and CT guidance.				
3	Magnetic resonance imaging applied to the urinary tract.				
4	Experience of angiography.				

Level 1: The trainee has a comprehensive understanding of the principles of the procedure including, where applicable, complications and interpretation of the results and has witnessed the procedure being performed.

Level 2: The trainee is able to carry out the procedure under direct supervision.
Level 3: The trainee is able to carry out the procedure under indirect supervision.
Level 4: The trainee is able to carry out the procedure competently and independently

II –Reporting Skills:				
Name of the case	**Total number of required cases**	**No. of cases to carry out as an observer (O)**	**No. of cases to carry out under supervision (S)**	**No. of cases to carry out independently (I)**
Congenital :	**80**	**-**	**10**	**70**
IVC anomalies				
Horseshoe Kidney				
- Renal Ectopia and Agenesis				
Ureteropelvic Junction Obstruction				
Congenital Megacalyces and Megaureter				
- Duplicated and Ectopic Ureter				
Ureterocele				
Uretheral diverticulum				
Tumors :	**200**	**-**	**50**	**150**
Retroperitoneal lipoma				

Retroperitoneal teratoma				
Retroperitoneal Sarcoma				
-Retroperitoneal lymphoma				
Retroperitoneal metastasis				
Adrenal Cyst				
Adrenal Adenoma				
Adrenal Myelolipoma				
Pheochromocytoma				
Adrenal Carcinoma				
Adrenal Metastases				
Renal Angiomyolipoma				
Renal Oncocytoma				
Multilocular Cystic Nephroma				
Renal Cell Carcinoma				
Renal Transitional Cell Carcinoma				

Renal Lymphoma				
-Ureteral Transitional Cell Carcinoma				
Urinary bladder carcinoma				
Uretheral neoplasm				
Testicular neoplasm				
Benign Prostatic Hypertrophy				
Prostate Carcinoma				
Vascular lesions	**180**	**-**	**20**	**160**
Renal Artery Stenos				
Renal Infarction				
Renal Vein Thrombosis				
Testicular Torsion				
Testicular infarction				
Varicocele				
Portal vein thrombosis				

Veno occlusive disease				
Inflammation:	**100**	**-**	**10**	**90**
Retroperitoneal Fibrosis				
Acute Pyelonephritis				
Chronic Pyelonephritis				
Emphysematous Pyelonephritis				
Renal Abscess				
Pyonephrosis				
Uretheral stricture				
-Epididymitis				
Hydrocele				
Pyocele				
Prostatitis and Abscess				
Traumatic lesions	**60**	**-**	**10**	**50**
Renal cysts:	**500**	**-**	**-**	**500**

Renal Cyst				
Parapelvic (Peripelvic) Cyst				
Autosomal Dominant Polycystic Kidney Disease				
Medullary Cystic Kidney Disease				
Others	**600**	**-**	**-**	**60**
-Nephrocalcinosis				
Adrenal Hyperplasia				
Renal failure and medical renal Disease				
Hydronephrosis				
Renal Cortical Necrosis				
Renal Papillary Necrosis				
Chronic Renal Failure				
III –Clinical and practical Skills:				
US studies:	**100**	**-**	**-**	**100**
Renal US				
Scrotal US:				
Penile US				
Contrast studies:	**30**	**-**	**10**	**20**

Micturating cysto-urethrogram				
Intravenous urogram				
Retrograde pyelo-ureterography				
Loopogram				
Nephrostogram				
Ascending urethrogram				
Interventional Techniques:	**10**	**8**	**2**	**-**
US guided biopsy				
CT guided biopsy				

Signature of head of the section ***Signature of head of the department***

VI-Work list:

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

5-Gynecological and obstetric radiology course

Content:

I –Targets

II –Reporting Skills

III- Clinical and practical skills.

IV-Worklist

Targets		**Level Achieved**			
		1	**2**	**3**	**4**
Core knowledge & skills					
1	Knowledge of obstetric and gynecological anatomy and clinical practice relevant to diagnostic radiology.				
2	Knowledge of the physiological changes affecting imaging of the female reproductive organs.				
3	Knowledge of the changes in maternal and fetal anatomy during gestation.				
4	Awareness of the applications of angiography and vascular interventional techniques.				
5	Awareness of the applications of magnetic resonance imaging in gynecological disorders and obstetrics.				
6	Identify the recent technical innovations in different imaging modalities and learn how to apply them to reach a final diagnosis.				
7	Reporting plain radiographs performed to show gynecological disorders.				
8	Performing and reporting transabdominal and endovaginal ultrasound in gynecological disorders, including possible complications of early pregnancy (e.g. ectopic).				
9	Supervising and reporting computed tomography in gynecological disorders.				
10	Supervising and reporting magnetic resonance imaging in gynecological disorders.				
11	Supervising and reporting magnetic resonance imaging in obstetric applications (e.g. assessing pelvic dimensions).				
12	Familiarity of the application of different advanced MRI techniques in female pelvis (including dynamic studies, DWI, etc.)				
Core experience					
1	Performing and reporting hysterosalpingography.				
Extended experience					
1	Observation of fetal MRI.				
2	Performing and reporting transabdominal and endovaginal ultrasound in obstetrics.				

Level 1: The trainee has a comprehensive understanding of the principles of the procedure including, where applicable, complications and interpretation of the results and has witnessed the procedure being performed.
Level 2: The trainee is able to carry out the procedure under direct supervision.
Level 3: The trainee is able to carry out the procedure under indirect supervision.
Level 4: The trainee is able to carry out the procedure competently and independently

	II –Reporting Skills:			
Name of the case	**Total number of required cases**	**No. of cases to carry out as an observer (O)**	**No. of cases to carry out under supervision (S)**	**No. of cases to carry out independently (I)**
1. Ovarian Lesions	**500**	**-**	**100**	**400**
• Physiological cysts & their complications				
• Corpus Luteum of pregnancy				
• Endometriosis				
• Polycystic ovary syndrome				
• Surface epithelial-stromal; Serous, mucinous & endometrioid				
• Germ cell tumors				
• Other surface epithelial-stromal tumors				
• Secondary neoplasms				
• Sex cord stromal tumors				
• Struma Ovarii				

• Ovarian carcinoid				
• Tubo-ovarian abscess Ovarian torsion				
• Tubo-ovarian abscess Ovarian torsion				
Uterine	**500**	**-**	**100**	**400**
• Mullerian Duct Uterine Anomalies				
• Nabothian cysts				
• Leiomyoma				
• Adenomyosis				
• Cervical polyp				
• Utrine Carcinoma				
• SCC of the cervix				
• IUD placement & complications				
• Nabothian cysts				
• Simple endometrial hyperplasia				
• Endometrial polyps				
Vagina and Labia	**50**	**-**	**10**	**40**
• SCC of vagina				
• Vulval carcinoma				
• Bartholin's Cyst				
• Vaginal Fistula				
• Imperforate Hymen				

Obstetric and placental diseases	**100**	**-**	**-**	**100**
Post partum complications				
Anomaly scan				
Placental anomalies				
Complicated pregnancy				
III –Clinical and practical Skills:				
US Studies:	**200**	**-**	**-**	**200**
Obstetric US				
Pelvic trans-abdominal US				
TVS				
Obstetric Doppler	**100**	**-**	**-**	**100**
-Umbilical vessels Doppler				
-ACA &MCA Doppler				
- Evaluation of placenta brevia				
Contrast Studies:	**50**	**-**	**10**	**40**
HSG				

Interventional and advanced techniques:	**800**	**-**	**200**	**600**
Uterine Angiography				
DWI &ADC Map post-processing				
Dynamic MRI studies post-processing				
Other advanced techniques				

Signature of head of the section ***Signature of head of the department***

VI-Work list:

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

6-Breast radiology course:

Content:

I –Targets.
II –Reporting Skills
III- Clinical and practical skills.
IV-Worklist.

I- Targets		Level Achieved			
		1	2	3	4
Core knowledge					
1	Demonstrate an understanding of common imaging-related artifacts				
2	Recognize the clinical impact of physiological breast changes related to advanced breast imaging modalities.				
3	Recognize a good-quality mammogram, ultrasound, and MRI.				
4	Demonstrate the ability to discuss the technical and physical aspects important for obtaining optimal breast MRI/US studies.				
5	Recognize the need for additional breast imaging studies.				
6	Demonstrate the ability to identify the features of malignant and benign breast diseases using various imaging modalities.				
7	Demonstrate the ability to establish a plan for the management or follow-up of probably benign disease/lesions.				
8	Demonstrate an understanding of the techniques and				
9	Indications for galactography.				
10	Familiarity with the evaluation of postsurgical and postradiation breast changes.				
11	Demonstrate an understanding of the radiological– pathological correlation				
12	Demonstrate a basic understanding of the indications for and Interpretation of breast mri studies.				
13	Reporting breast tomosynthesis and contrast enhanced mammography				
14	Generate an effective mammography/sonography/MRI report according to recent ACR-Lexicon.				
Extended experience					
1	Performing breast biopsy and localization.				
2	Performing stereotactic biopsy				
3	Perform US guided breast mass clipping and guide wire placement				

Level 1: The trainee has a comprehensive understanding of the principles of the procedure including, where applicable, complications and interpretation of the results and has witnessed the procedure being performed.
Level 2: The trainee is able to carry out the procedure under direct supervision.
Level 3: The trainee is able to carry out the procedure under indirect supervision.
Level 4: The trainee is able to carry out the procedure competently and independently (independent competence).

II –Reporting Skills:

Name of the case	Total number of required cases	No. of cases to carry out as an observer (O)	No. of cases to carry out under supervision (S)	No. of cases to carry out independently (I)
Benign masses:	**1200**	**-**	**300**	**900**
Fibro adenoma				
Fat necrosis				
Papilloma				
Fibrocystic changes				
-Lipoma				
Hematoma				
Malignant masses:	**400**	**-**	**100**	**300**
Inflammatory breast cancer				
Ductal carcinoma in situ				
Invasive ductal carcinoma				
Invasive lobular carcinoma				
Medullary carcinoma				
Mucinous carcinoma				

Papillary carcinoma				
Calcification:	**1000**	**-**	**300**	**700**
Punctate calcification				
Popcorn calcification				
Rod calcification				
-Vascular calcification				
Pleomorphic calcification				
Amorphous calcification				
Fine linear calcification				
Linear branching calcification				
Heterogeneous coarse calcification				
Post-operative changes:	**1000**	**-**	**200**	**800**
-Seroma				
-Postoperative fibrosis				
-Postoperative enhancing granulation tissue				
-Recurrent breast cancer				
Breast implant:	**20**	**-**	**10**	**10**

Intra capsular rupture				
Extra capsular rupture				
III –Clinical and practical Skills:				
US Studies:	**500**	**-**	**100**	**400**
Breast US				
Interventional Techniques:	**400**	**-**	**100**	**300**
True cut biopsy				
Clip placement				
Guide wire placement				
Charcoal localization				
Advanced Techniques :	**100**	**20**	**30**	**15**
Dynamic breast MRI Post-processing				
DWI and ADC Map post-processing				
DTI Post-Processing				
Other advanced techniques post-processing				

Signature of head of the section ***Signature of head of the department***

IV-Work list:

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

7-Musculoskeletal radiology Course:

Content:

I –Targets.
II –Reporting Skills
III- Clinical and practical skills.
IV-Worklist.

I- Targets		Level Achieved			
		1	2	3	4
Core knowledge					
1	demonstrate the ability to recognize and describe complications of orthopedic devices, including fracture fixation, spine, and arthroplasty hardware				
2	Demonstrate the ability to develop an approach toward joint diseases, including knowledge of clinical and imaging features differentiating various forms of arthritis.				
3	Demonstrate a basic understanding of the relevant clinical management of common musculoskeletal disorders.				
4	Demonstrate greater efficiency in dealing with plain film examinations and diagnoses, CT and MR interpretations, and case management.				
5	Demonstrate an understanding of metabolic as well as endocrine and toxic disorders.				
6	Describe imaging manifestations of miscellaneous MSK disorders,				
7	Demonstrate an understanding of clinical syndromes with MSK manifestations, e.g., neurofibromatosis, etc.				
8	Demonstrate an understanding of the imaging findings for soft tissue, ligament, and tendon injuries and their associated manifestations				
9	Demonstrate the ability to recognize and describe complications of orthopedic devices, including fracture fixation, spine, and arthroplasty hardware.				
10	Supervising and reporting computed tomography of the musculoskeletal system.				
11	Supervising and reporting magnetic resonance imaging of the musculoskeletal system.				
12	Performing and reporting ultrasound of the musculoskeletal system.				
Extended experience					
1	Familiarity with the application of angiography.				
2	Patient preparation.				
3	Observation of image-guided bone biopsy.				

Level 1: The trainee has a comprehensive understanding of the principles of the procedure including, where applicable, complications and interpretation of the results and has witnessed the procedure being performed.

Level 2: The trainee is able to carry out the procedure under direct supervision.
Level 3: The trainee is able to carry out the procedure under indirect supervision.
Level 4: The trainee is able to carry out the procedure competently and independently (independent competence)

II –Reporting Skills:

Diagnosis of the case	Total number required	No. of cases to be observed (O)	No. of cases to carry out under supervision (S)	No. of cases to carry out independently (I)
Congenital	20	14	4	2
• Osteogenesis imperfecta • Ostepetrosis • Achondroplasia • Fibrous dysplasia • Diaphyseal aclasis • Mucopolysaccharidosis				
Trauma	200	100	60	40
• Fractures • Dislocation • Osteo-chondral injury • Muscle injury				
Infection	200	100	60	40
Osteomyelitis Diabetic foot Septic arthritis TB arthritis				

- pyogenic spondylodiscitis - TB spondylodiscitis - Soft tissue infection				
Osteonecrosis& apophysitis	**40**	**20**	**10**	**10**
- Femoral head AVN - Scaphoid osteonecrosis - Keinbochs disease - Freiberg - kohler - Sheurmann - Bone infarction - Osteochondritis dissecans				
Arthritis	**30**	**18**	**6**	**6**
Degenertaive Inflammatory: **□ Rheumatoid arthritis** **□ Seronegative arthritis** **Metabolic arthritis (Gout& others)**				
Bone tumors	**80**	**40**	**20**	**20**

• **Osteoma** • **Osteoblastoma** • **Osteosarcoma** • **Cartilaginous Tumors** • **Enchondroma** • **Fibrous Tumors** • **Histiocytoma** • **Osteochondroma** • **Chondroblastoma** • **Chondromyxoid Fibroma** • **Chondrosarcoma** • **Fibrosarcoma** • **Fibrous Dysplasia** • **Malignant Fibrous**				
Miscellaneous Tumors and Tumor-Like Lesions	**80**	**40**	**20**	**20**
Giant Cell Tumor **Intraosseous Hemangioma** **Unicameral Bone Cyst** **Aneurysmal Bone Cyst** **Intraosseous Lipoma** **Adamantinoma**				
Soft tissue tumors	**20**	**10**	**6**	**4**

Fibrosarcoma, **Fibromatosis** **Malignant Fibrous Histiocytoma** **Pigmented-Villonodular Synovitis** **Synovial Sarcoma** **Lipoma** **Soft Tissue Liposarcoma,** **Benign Peripheral Nerve Sheath Tumor** **Malignant Peripheral Nerve Sheath Tumor** **Hemangioma**				
Hematological disease	**20**	**10**	**6**	**4**
• **Hemolytic anemia** • **Leukemia** • **Lymphoma** • **Histiocytosis**				
Metabolic	**20**	**10**	**6**	**4**
• **Rickets** • **Osteoporosis** • **Osteomalaca**				
Shoulder	**40**	**20**	**10**	**10**
• **Tendinopathy** • **Rotator Cuff Tear** • **Rotator Cuff Impingemnt** • **Instability** • **Bankart Lesion** • **Bankart variants**				
Elbow	**20**	**10**	**6**	**4**

• Lateral Epicondylitis • Medial Epicondylitis				
Wrist and Hand	**40**	**20**	**10**	**10**
•Triangular-Fibrocartilage Tear •Scaphoid Non-union •Carpal Tunnel Syndrome •Guyon's Canal •Carpal Instability •Scapholunate Ligament Tear •Ganglion Cyst Tenosynovitis				
Hip	**60**	**30**	**20**	**10**
• Transient Osteoporosis • Avulsion Fractures • Avascular Necrosis Legg- • Calve-Perthes • Femoroacetabular Impingement				
Knee	**60**	**40**	**10**	**10**
• Meniscal Degeneration • Meniscal Tear • Anterior Cruciate Ligament ACL) Tear • ACL Reconstruction • Posterior Cruciate Ligament • Collateral Ligament tear bursitis				
Ankle and Foot	**40**	**30**	**6**	**4**

• **Achilles Achilles Tendon Tear** • **Flexor & extensor tendon abnormalities** • **Ligamentous injury** • **Tarsal Tunnel Syndrome** • **Posterior Impingement** **Sinus Tarsi Syndrome**				
III –Clinical and practical Skills:				
MSK US	**20**	**10**	**10**	**-**
Interventional techniques:	**6**	**4**	**2**	**-**
MRI and CT arthrography				

Signature of head of the section ***Signature of head of the department***

IV-Work list:

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

8-Chest radiology course:

Content:

I –Targets
II –Reporting Skills
III- Clinical and practical skills.
IV-Worklist.

I- Targets		Level Achieved			
		1	2	3	4
Core knowledge & Skills					
1	Knowledge of thoracic anatomy and clinical practice relevant to diagnostic radiology.				
2	Knowledge of the manifestations of thoracic disease demonstrated by conventional radiography and CT.				
3	Knowledge of the application of radionuclide investigations to thoracic pathology with particular reference to radionuclide lung scintigrams.				
4	Knowledge of the application, risks and contraindications of the technique of image-guided biopsy of thoracic lesions.				
5	Identify the recent technical innovations in different imaging modalities and learn how to apply them to reach a final diagnosis.				
6	Reporting of plain radiographs performed to show thoracic disease.				
7	Reporting radionuclide lung scintigrams.				
8	Supervising and reporting computed tomography of the thorax, including high-resolution examination and CT pulmonary angiography.				
9	Supervising and reporting magnetic resonance imaging.				
10	Familiarity with the advanced imaging techniques in chest				
11	Drainage of pleural space collections under image guidance.				
Extended experience					
1	Observation of image-guided biopsies of lesions within the Thorax.				
2	Familiarity with the applications of the following techniques: - Magnetic resonance imaging. - Angiography.				

Level 1: The trainee has a comprehensive understanding of the principles of the procedure including, where applicable, complications and interpretation of the results and has witnessed the procedure being performed.
Level 2: The trainee is able to carry out the procedure under direct supervision.
Level 3: The trainee is able to carry out the procedure under indirect supervision.
Level 4: The trainee is able to carry out the procedure competently and independently (independent competence).

II –Reporting Skills:				
Name of the case:	**Total number of required cases**	**No. of cases to carry out as an observer (O)**	**No. of cases to carry out under supervision (S)**	**No. of cases to carry out independently (I)**
Chest wall and Pleural diseases	**75**	**-**	**5**	**70**
Pleural effusion				
Pneumothorax & hydro pneumothorax				
Empyema				
Pleural thickening				
Pleural masses				
Diaphragmatic rupture / hernia				
Bony fractures				
Bony tumors				
Mediastinum	**50**	**-**	**10**	**44**
Pneumo-mediastinum				

Mediastinal masses				
Pericardial effusion				
Pulmonary infection	**100**	**-**	**10**	**90**
pneumonia				
Pulmonary TB				
Fungal infection				
Airway diseases	**75**	**-**	**5**	**70**
Bronchiectasis				
Emphysema				
Bronchiolitis				
Lung collapse				
Pulmonary edema / hemorrhage				
Pulmonary neoplasms	**100**	**-**	**10**	**90**
Bronchogenic carcinoma				
Other lung neoplasms				

Pulmonary nodules				
Lymphangitis carcinomatosis				
HRCT	**100**	**25**	**25**	**50**
Interstitial lung diseases				
Pulmonary embolism	**50**	**5**	**5**	**40**
Congenital lung diseases	**20**	**5**	**5**	**10**
III –Clinical and practical Skills:				
Chest US	**15**	**-**	**-**	**15**
Interventional and advanced Techniques:	**130**	**38**	**29**	**53**
CT guided biopsy	**30**	**10**	**5**	**5**
Bronchial Angiography	**5**	**3**	**1**	**1**

Pleurocentesis	**15**	**-**	**-**	**15**
Advanced techniques post-processing:	**50**	**15**	**15**	**20**
Volumetric CT post-processing	**20**	**5**	**5**	**10**
CT virtual bronchoscopy post-processing	**10**	**5**	**3**	**2**

Signature of head of the section ***Signature of head of the department***

IV-Work list:

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

9-Cardiac radiology course:

Content:

I –Targets
II –Reporting Skills
III- Clinical and practical skills.
IV-Worklist.

I-Targets		**Level Achieved**			
		1	**2**	**3**	**4**
Core knowledge and skills					
1	Knowledge of the cardiac anatomy and clinical practice relevant to diagnostic radiology.				
2	Prepare a patient for cardiac CT, including the verification of indications, venous access, and beta-blocker therapy.				
3	Select optimal acquisition parameters for cardiac CT.				
4	Select optimal post-processing tools for cardiac CT.				
5	Prepare a patient for cardiac MRI, including the verification of indications, venous access, and medication(e.g., stress tests).				
6	Select optimal acquisition parameters for cardiac MRI.				
7	Select optimal post-processing tools for cardiac MRI.				
8	Apply ECG gating for cardiac CT and MRI.				
9	Reporting plain radiographs performed to show cardiac disease.				
10	Reporting CT coronary angiography.				
11	Reporting common cardiac conditions shown by CT and MRI.				
12	Reporting common types of cardiac anomalies using CT and MRI				
13	Reporting common post-operative cardiac conditions using CT and MRI				
14	Familiarity of the application of advanced CT and MRI techniques in cardiac imaging.				
Extended experience					
1	Observation of relevant angiographic, echocardiographic and radionuclide studies.				

Level 1: The trainee has a comprehensive understanding of the principles of the procedure including, where applicable, complications and interpretation of the results and has witnessed the procedure being performed.
Level 2: The trainee is able to carry out the procedure under direct supervision.
Level 3: The trainee is able to carry out the procedure under indirect supervision.
Level 4: The trainee is able to carry out the procedure competently and independently (independent competence)

II –Reporting Skills:

Name of the case	Total number of required cases	No. of cases to carry out as an observer (O)	No. of cases to carry out under supervision (S)	No. of cases to carry out independently (I)
Congenital	**50**	**10**	**30**	**10**
-Tetralogy of fallot -Transposition of great vessels -Ebstien anomaly -Total and partial anomalous pulmonary venous return -Coarctation of the aorta -Isomerism and heterotaxy -Pulmonary atresia -DORV -Hypoplastic LT/RT heart syndrome -Tricuspid atresia -Extra-cardiac vascular anomalies				
Aortic arch and vascular anomalies	**15**	**5**	**5**	**5**

- Left sided aortic arch with aberrant right subclavian artery - Double aortic arch. - Right sided aortic arch - with mirror image branching pattern - with aberrant left subclavian artery - Innominate artery compression syndrome - Aortic coarctation				
Pulmonary arterial anomalies:	**10**	**5**	**2**	**3**
- Pulmonary agenesis - Pulmonary sling - PDA				
Pulmonary venous anomalies:	**8**	**4**	**2**	**2**
- Partial anomalous venous return - Scimitar syndrome				
Systemic veins:	**8**	**4**	**2**	**2**
- Left SVC				

- Interrupted IVC with azygos continuation				
Acquired valvular heart disease	**20**	**5**	**5**	**10**
-Mitral stenosis and regurgitation -Aortic stenosis & regurgitation -pulmonary stenosis & regurgitation -Tricuspid stenosis & regurgitation -Mitral and tricuspid valve prolapse - Valvular masses				
Cardiomyopathy				
1-Ischemic cardiomyopathy	**15**	**5**	**5**	**5**
-MRI in infarction and myocardial scar				
2-Non ischemic cardiomyopathy	**15**	**5**	**5**	**5**
-Hypertrophic cardiomyopathy - Dilated cardiomyopathy - Restrictive cardiomyopathy -Amyloidosis -Sarcoidosis				

-Constrictive cardiomyopathy -ARVC -LV non compaction.				
3-Myocarditis	**5**	**3**	**1**	**1**
-Myocarditis -Myocardial infiltrative				
Cardiac masses	**8**	**4**	**2**	**2**
-Angiosarcoma -Metastases -Fibroma -Myxoma -Rhabdomyoma. -fibro-elastoma -Lipoma -Non neoplastic masses, Thrombus				
Pericardial diseases	**5**	**3**	**1**	**1**
-Pericardial effusion -Pericarditis -Pericardial metastasis				
Coronary CTA				

1-CCTA techniques, anatomy and other coronary arteries anomalies	**10**	**4**	**4**	**2**
- CCTA of normal coronary anatomy -Common coronary artery anomalies including: ○ Origin ○ Course ○ Termination ○ Fistula				
2-Ca score, atherosclerosis, CAD,	**30**	**10**	**10**	**10**
-Coronary calcium scoring -Coronary artery disease of different CAD RAD - Coronary artery stent				
3-Stent and CABG assessment.	**20**	**10**	**5**	**5**
- CABG with LIMA - Venous CABG				
Aortopathy and Acute aortic syndromes:	**20**	**5**	**5**	**10**
- Aortic dissection				

- Aortic aneurysm with rupture, leakage, thrombosis, impending rupture - Penetrating aortic ulcer - Intramural hematoma -Vasculitis -Aortic aneurysm				
III –Clinical and practical Skills:				
Advanced techniques post-processing	**45**	**13**	**11**	**21**
CT Coronary angiography post-processing	**20**	**5**	**5**	**10**
Cardiac MRI post-processing	**20**	**5**	**5**	**10**
Other advanced techniques post-processing	**5**	**3**	**1**	**1**

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IV-Work list:

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

10-Vascular and Intervention course:

Content:

I –Targets
II –Reporting Skills
III- Clinical and practical skills.
IV-Worklist.

I-Targets		**Level Achieved**			
		1	**2**	**3**	**4**
Core knowledge & Skills					
1	Knowledge of vascular anatomy and clinical practice relevant to diagnostic radiology.				
2	Familiarity with the indications, contraindications, pre-procedure preparation, sedation and anesthetic regimens, patient monitoring during procedures, procedural techniques and post-procedure patient care relevant to vascular intervention.				
3	Familiarity with procedure and post-procedure complications and their management.				
4	Familiarity with the appropriate applications of the following techniques: - Ultrasound (including Doppler) - Digital subtraction angiography. - Intra-arterial angiography. - Computed tomography and CT angiography. - Magnetic resonance imaging and MR angiography.				
5	Reporting plain films radiographs relevant to cardiovascular disease.				
6	Femoral artery puncture techniques, and the introduction of guide wires and catheters into the arterial system.				
7	Venous puncture techniques, both central and peripheral, and the introduction of guide wires and catheters into the venous system.				
8	Performing and reporting the following procedures: - Lower limb angiography. - Arch aortography. - Abdominal aortography. - Lower limb venography (contrast or ultrasound).				
9	Performing the following techniques: - Ultrasound (including Doppler), venous and arterial. - Digital subtraction angiography.				
10	Supervising and reporting CT examinations of the vascular system (CTA).				
11	Supervising and reporting MRI examinations of the vascular system (MRA).				

Extended experience-Imaging					
1	Selective angiography (e.g. hepatic, renal, visceral)				
2	Pulmonary angiography.				
3	Alternative arterial access (e.g. brachial, axillary puncture).				
4	Upper limb venography.				
5	Portal venography.				
6	Portal venography via femoral approach.				
7	Superior vena cavography.				
8	Inferior vena cavography.				
Core experience-Interventional					
1	angioplasty.				
2	Embolization.				

Level 1: The trainee has a comprehensive understanding of the principles of the procedure including, where applicable, complications and interpretation of the results and has witnessed the procedure being performed.

Level 2: The trainee is able to carry out the procedure under direct supervision.

Level 3: The trainee is able to carry out the procedure under indirect supervision.

Level 4: The trainee is able to carry out the procedure competently and independently (independent competence).

II –Reporting and Clinical Skills:			
Name of the case	**No. of cases to carry out as an observer (O)**	**No. of cases to carry out under supervision (S)**	**No. of cases to carry out independently (I)**
Lower limb arterial ischemia	**5**	**5**	**70**
DVT	**5**	**5**	**90**
Superficial thrombophlebitis	**5**	**5**	**90**
Evaluation of varicose veins	**5**	**5**	**90**
Mapping for A-V fistula preparation	**5**	**5**	**40**
A-V fistula maturation and follow up	**5**	**5**	**40**

Evaluation of varicocele	**5**	**5**	**70**
Carotid and vertebral arteries Doppler	**5**	**5**	**70**

IV –Clinical and Practical Skills:

Arterial Puncture	**5**		**40**
Venous Puncture	**5**		**40**
Digital Subtraction Angiography	**5**		**40**
Selective angiography (e.g. hepatic, renal, visceral)	**5**	**5**	**20**
Pulmonary angiography.	**5**	**5**	**20**

Alternative arterial access (e.g. brachial, axillary puncture).	**5**	**5**	**10**
Upper limb venography.	**5**	**5**	**40**
Portal venography.	**-**	**-**	**-**
Portal venography via femoral approach.	**5**	**5**	**5**
Superior vena cavography.	**5**	**5**	**20**
Inferior vena cavography.	**5**	**5**	**20**

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IV-Work list:

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Diagnosis of the case	Acc. No	Approach			Date	Signature
		O	S	I		

Section 3:-

Lectures attendance

First semester

- ***Advanced radiological &clinical physics &radiation protection module:*** 2 credit hours
- ***Interventional Radiology module:*** 2 credit hours
- ***Advanced Medical statistics:*** 2 credit hours
- ***Advanced Research methodology:*** 2 credit hours
- ***Medical education:*** 1 credit hour
- ***Advanced computers for medical sciences:*** 1 credit hour.
- ***Language (TOEFL/EIELTS):*** 1 credit hour

Advanced radiological &clinical physics &radiation protection module

X-ray

Subjects	Date	Lecturer	signature
Principles of Digital imaging			

US

Subjects	Date	Lecturer	signature
THI			
Doppler			

CT

Subjects	Date	Lecturer	signature
Multi-slice CT			
CTA			

MRI

Subjects	Date	Lecturer	signature
1-MRI Perfusion			
2-Advanced functional MRI applications			
3-MRI (Basics)			
4MRA			
5-DWI			
6-MRS			
7- Artifacts			
8- BOLD			

- **Credit hours: 2**
- **Time of attended lectures: hours**
- **Percentage: %**

Signature of responsible chief Signature of department chief

Interventional Radiology module

Subjects	Date	Lecturer	signature
A: Nonvascular intervention:			
Image guided (US & CT) biopsies.			
Image guided (US & CT) fluid / collection aspiration and drainage.			
Hepatobiliary intervention: Percutaneous cholecystectomy, PTC, percutaneous external / internal biliary drainage.			
Hepatic malignancy management: Barcelona criteria, RF, MWA, chemoembolization ...			
Urology interventions: Nephrostomy, antegrade ureteric catheter insertion, renal tumor embolization and renal tumor RF ablation.			
RF ablation: Hepatic, renal, bone, lung and thyroid. Including micro-wave ablation and cryo-ablation.			
GIT interventions: Balloon dilatation of GIT strictures and stent insertion – gastrostomy			

tube insertion – management of GIT bleeding.			
Pain management: epidural injections, nerve blocks, radiofrequency ablation, facet joint injections, celiac plexus block, lumbar sympathetic plexus blocks, vertebral interventional procedures, hypogastric plexus block, splanchnic nerve block, stellate ganglion block, piriformis injection, and trigger point injections.			
B: Vascular intervention:			
Introduction: • Types of stents, indication and contraindications. • Guidewires • Balloons • Types of embolic material, indications, and CI.			
Peripheral vascular disease (Extremity ischemia): Indications, angioplasty, and stenting.			
Peripheral Vascular Disease: Abdominal Aneurysm and Dissection			

IVC Filter Placement/Pulmonary Thromboembolic Disease			
Central Venous Access			
Hemodialysis Access intervention (angioplasty, stenting, thrombolysis, percutaneous dialysis fistula creation)**.**			
Embolization			
C: Neuro-intervention			
Overview of carotid angiography, Angioplasty, and stenting.			
Mechanical thrombectomy in ischemia.			

- **Credit hours: 2**
- **Time of attended lectures: hours**
- **Percentage: %**

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Advanced Medical statistics

Advanced Research methodology

Medical education

Advanced computers for medical sciences

Language

Second, third and fourth semesters

Module

Advanced Neuro and head and neck imaging

5 credit hours

- Neuroradiology
- Radiology of head and neck
- Neuro-Vascular Imaging
- Pediatrics radiology 1
-

	Chapters	Subjects	Date	lecturer	Signature
I. Brain:	**1- Congenital Malformations & Neurocutaneous Syndromes:**				
		1- Congenital malformations			
		2- Congenital malformations 1			
		3- Neurocutaneous syndromes 1			
		4- Neurocutaneous syndromes2			
	2- Brain tumor:				
		5- Brain tumors			
		6- Brain tumors			
		7- Brain tumors			
		8- Brain tumors			
		9- Film interpretation			
	4- White matter disease:				
		10- Degenerative disease(inherited)			
		11- Degenerative disease acquired			
		12- Metabolic/toxic			
		13- Film interpretation			
	5- Infection:				
		14- Congenital			
		15- Acquires(bacterial)			
		16- Acquires(viral-fungal)			
	3- Vascular:				
		17- Infarction			
		18- Hemorrhage			
		19- Vascular anomalies			
		20- Vascular anomalies			
	6- skull base:				
		21- Skull base:			

		22- Skull base			
	7-Ventricles & Cisterns:				
		25- Hydrocephalus			
II. Spine:	**1- Congenital and developmental disorders:**				
		23- Congenital and developmental disorders I			
		24- Congenital and developmental disorders II			
	2- Infection, Inflammatory and degenerative disease.				
		25- Infection and degenerative disease.			
	3- Spinal tumors:				
		26- Spinal tumors			
	4- Trauma to the spine				
		27- Trauma to the spine			
	5- Vascular and Systemic Disorders				
		28- Vascular and Systemic Disorders			
	6- Post-Operative Imaging and Complications				
		29- Post-Operative Imaging and Complications			
	7- Film interpretation				
		30- Film interpretation			
	8- Advanced techniques neuro imaging				
III. Head	**a. Orbit :**				
		31-			
		32- Film interpretation			
	b. Nose & PNS:				
		33-			

		34- Film interpretation			
	c. Temporal bone :				
		35- Inflammatory			
		36- Neoplastic			
	d. Introduction to neck spaces				
		37- Introduction to neck spaces			
	e. Pharynx				
		38- Pharynx			
	f. LARYNX				
		39- Larynx			
	g. ORAL CAVITY &MASTICATOR Space& submandibular space:				
		40- Oral cavity &masticator space& submandibular space:			
	h. Facial Trauma				
		41- Facial Trauma			
	i. Parotid space & para-pharyngeal space				
		42- Parotid space & para-pharyngeal space			
	j. Carotid space				
		43- Carotid space			
	k. Thyroid				
		44- Thyroid			
	l. Mandible & maxilla &TMJ				
		45- Mandible			
	m. Syndromic diseases				
	n. LNs				
		46- LNs			
	o. Transspatial and multispatial				
		47-			
	p. Film interpretation				
		48- Film interpretation			
	m. Advanced techniques in head and neck imaging				

IV. Pediatric I	**1- DD. Of pediatric brain tumors:**				
		49-D.D Of pediatric brain tumors:			
	2- D.D of pediatric neck masses:				
		50-D.D of pediatric neck masses			

- **credit hours: 5**
- **Time of attended lectures: hours**
- **Percentage: %**

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Module

Advanced abdomen & pelvic and woman imaging

5 credit hours

- Gastro-enterology.
- Urinary system.
- Genital system.
- Breast.
- Pediatrics radiology 2.

		Subjects	Date	lecturer	Signature
Pediatric2 (Gastroenterology)	Alimentary tract	• Esophageal Atresia and gastroesophageal reflux • Gastric Volvulus • Hypertrophic Pyloric Stenosis • Duodenal Atresia or Stenosis • jejunoileal Atresia • Mal-rotation			
		• Midgut Volvulus • Ileocolic Intussusception (Idiopathic) • Meconium Ileus&Meconium Plug Syndrome • Meckel Diverticulum • Hirschsprung Disease • Anorectal Malformation.			
	liver	• Diffuse liver disease • Focal liver disease			
	Biliary	• Biliary Atresia • Choledochal Cyst • Caroli Disease			
	General	• Abdominal manifestation of systemic conditions			
		• Metabolic and inherited conditions			
		• Vascular Disorders			
		• Trauma			
		• Foreign Bodies			
		• Transplantation			

		• Malignant Neoplasms			
		• Treatment Response Assessment			
Adult (Gastroenterology)	**Alimentary tract**	• Esophagus.			
		• Stomach • Duodenum			
		• Small intestine • Appendix			
		• Colon+ rectum			
	liver	• Diffuse liver disease			
		• Focal liver disease(benign)			
		• Focal liver disease(malignant)			
	Peritoneum ,mesentery and abdominal walls	• Infection • Hernias • Neoplasm			
	biliary	•			
	pancreas	•			
	liver	• Liver transplant			

	spleen	•			
Adult (Breast)	breast	• Benign Vs. malignant			
		• Lactating • Male breast • LN			
		• Cancer • Breast implant			
Pediatric2 (Urinary system & genital)	Urinary	• Congenital abnormalities • Multicystic renal diseases			
		• Renal masses • Adrenal masses			
	Genital	•			
	Others	• Rhabdomyosarcoma, Genitourinary • Sacrococcygeal Teratoma			

		Subjects	Date	lecturer	Signature
Adult (Urinary system)	Kidney	• Infection & inflammation			
		• Trauma			
		• Vascular			
		• Neoplasm (BG)			

		• Neoplasm (MG)			
		• Renal cysts			
		• Renal Failure and Medical Renal Disease			
		• Hydronephrosis			
	Ureter, bladder& urethra	• Infection ,inflammation • Trauma • neoplasm			
	Renal	• Renal transplant			
Adult Suprarenal gland	**Suprarenal gland**				
Adult Peritoneum & Retroperitoneal		• Peritoneum • Retroperitoneal			

	Others	• Duplications and Anomalies of IVC • Retroperitoneal Fibrosis • Degenerative Pelvic Lipomatosis • Treatment Related • Retroperitoneal Hemorrhage • Postoperative Lymphocele			
Adult (Genital)	**femal e**	• Uterus & cervix& vagina& valva			
		• Ovary			
		• Obstetric imaging			
	male	• Male genital system			
		• **Advanced techniques in abdomen and pelvis imaging**			

- **credit hours: 5**
- **Time of attended lectures: hours**
- **Percentage: %**

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Module

Advanced musculoskeletal radiology

Credit hours: 3

- Musculoskeletal system
- Pediatrics radiology 3

Branch	Chapter	Subjects	Date	lecturer	Signature
Pediatric3 (Musculoskeletal system)	**Deformity**	**Lower limb deformities** **Upper limb deformities** **Spine deformities**			
	Dysplasia	**Osteogenesis imperfecta** **Ostepetrosis** **Achondroplasia** **Fibrous dysplasia** **Diaphyseal aclasis** **Mucopolysaccharidosis**			
Adult (Musculoskeletal system)	**AVN & Paget disease**	**AVN** **Paget disease**			
	Metabolic & Endocrine				
	Infection				
	Arthritis				
	Oncology	Introduction			
		Bony tumors Fibrous tumors			
		Cartilaginous tumors Blood disease			
		Synovial Soft tissue lesions			

	Bone marrow				
	Joints	Shoulder joint			
		Elbow joint			
		Wrist joint , hands and fingers			
		Hip joint			
		Knee joint			
		Ankle joint and foot			
		Advanced techniques in MSK imaging			

- **credit hours: 3**
- **Time of attended lectures: hours**
- **Percentage: %**

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Module

Advanced chest & cardio-vascular radiology

3 Credit hours

- Chest.
- Cardio-Vascular
- Pediatrics radiology 4

chest	Pediatric and neonatal chest	Respiratory distress syndrome		
	Mediastinal masses	• Pediatrics &adults		
	Infection & Inflammation	• ***Cavitary lung lesions*** • Bacterial Pneumonia • Staphylococcus Pneumonia • Mycobacterial Pneumonia • Lung Abscess • Histoplasmosis • Aspergillosis • Blastomycosis • Coccidioidomycosis • Parasitic Pneumonia • Eosinophilic Pneumonia • Acute Interstitial Pneumonia • Viral Pneumonia • Pneumocystis Pneumonia		
	• Vascular • Heart failure	• Cardiogenic Pulmonary Edema • Non-cardiac Pulmonary Edema • Pulmonary Embolism • Diffuse Alveolar Hemorrhage • Pulmonary Artery Hypertension • Pulmonary Artery Aneurysm		
	Occupational & Interstitial lung diseases	•		

	Chest affection in systemic diseases	• Sarcoidosis • Idiopathic Pulmonary Fibrosis • Hypersensitivity Pneumonitis • Rheumatoid Arthritis • Scleroderma, Pulmonary 1 • Polymyositis - Dermatomyositis, Pulmonary • Nonspecific Interstitial Pneumonitis		
	Tracheal and major bronchi abnormalities	• Tracheopathia Osteochondroplastica • Tracheobronchomalacia • Relapsing Polychondritis • Saber-Sheath • Trachea		
	Air way & Neoplastic diseases	• Chronic Bronchitis • Bronchiectasis • Emphysema • Lung collapse • Allergic Bronchopulmonary Aspergillosis • Bronchioloalveolar Cell Carcinoma • Lymphangitic Carcinomatosis • Lymphocytic Interstitial Pneumonia Lymphangiomyomatosis • Carcinoid, Pulmonary • Kaposi Sarcoma, • Middle Lobe Syndrome • Bronchiolitis Obliterans		

	Pleura & Diaphragm	• Pleura: - Congenital - Inflammatory - Infectious - Toxic - Neoplastic - Vascular • Diaphragm: - Congenital - inflammatory		
	Thoracic emergencies	• Traumatic & non traumatic • Cardiovascular &non cardiovascular		
		Imaging in unit		
		Imaging of lung transplantation rejection		

Cardio	**Cardiac anatomy**	• Technique • Anatomy • Segmental		
	Congenital heart diseases	• Congenital heart diseases(1)		
		• Congenital heart diseases (2)		
		• Congenital heart diseases (3)		

		• Congenital heart diseases (4) • (Repair)		
	Valvular heart disease	• Acquired valvular heart diseases		

Cardio	Cardiac MRI & ischemic cardiomyopathy		
	Nonischemic cardiomyopathy and pericardium		
	CCTA techniques, anatomy and anomalies of coronary arteries		
	Ca score , atherosclerosis , CAD , stent and CABG assessment		
	-pericardial diseases -Cardiac tumors		
	-Recent advanced techniques in lung &heart -Other new applications -Nuclear Imaging		

Vascular	**1- Arterial:**				
		1- System			
		2- Local			
		3- Ischemia			
	2- Venous				
		4- DVT			
		5- Varicose vein			
	3- D.D				
		6-			

- **credit hours: 3**
- **Time of attended lectures: hours**
- **Percentage: %**

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Module

- **Artificial intelligence**

2 credit hours

Subjects	Date	Lecturer	Signature
Definition of artificial intelligence			
Role of artificial intelligence in Radiology: an overview			
Clinical applications of artificial intelligence and radiomics in neuro-radiology imaging			
Clinical applications of artificial intelligence in chest diseases			
Clinical applications of artificial intelligence in chest diseases			
The scope of artificial intelligence in Uro-radiology			
Role of AI in different gynecological lesions			
Applications of AI in mammography			
Applications of AI in Breast US			
Applications of AI in Breast MRI			

- **credit hours: 2**
- **Time of attended lectures: hours**
- **Percentage: %**

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Semester 5

A. **Advanced applied practical and clinical for radiology (8 credit hours)**
B. **Elective Courses (2 credit hours): (Choosing between recent advances in neuroradiology, recent advances in cardiac imaging and recent advances in vascular imaging)**

Choose between

(Choosing between recent advances in neuroradiology, recent advances in cardiac imaging and recent advances in vascular imaging)

Subjects	Date & hours	lecturer	Attendance
-Recent advances in neuroradiology			
-Recent advances in cardiac imaging			
- Recent advances in vascular imaging			

- **Credit hours: 2**
- **Time of attended lectures: hours**
- **Percentage: %**

Signature of head of the section ***Signature of head of the department***

Semester 6 & 7

تخصص للرسالة و التدريب الاكلينيكى المتقدم المتخصص

Section 4: Scientific activity

a) Department meeting attendance

b) MDT

c) Conferences attendance

d) Thesis discussion attendance

e) Training courses & workshops

f) Speakers in conferences.

g) Research Activities.

i) Electronic Library

h) Other activities.

Department meetings

NO	Name	Lecturer	Date	Time	Notes/ signature

NO	Name	Lecturer	Date	Time	Notes/ signature

MDT

NO	Name	Date	Time	Notes

Conferences attendance

NO	Name	Lecturer	Date	Time	Notes/ signature

Training courses & workshops

NO	Name	Lecturer	Date	Time	Notes/ signature

Thesis discussion attendance

NO	Title	Investigators	Date	Time	Notes/ signature

NO	Title	Investigators	Date	Time	Notes/ signature

Speakers in conferences

NO	Title	Conference name	Date	Notes/ signature

Research activities

NO	Title	Date	Notes/ signature

Electronic Library

Case number	Diagnosis	Date	Signature

Other activities

NO	Title	Date	Notes/ signature

Section 5 :-References

Recommended Books for first part topics:

- Imaging Atlas of Human Anatomy.4th Edition. Jamie Weir, Peter Abrahams, Jonathan D Spratt & Lonie Salkowski, Eds. Mosby Elsevier, 2011
- The Essential Physics of Medical Imaging.3rd Edition. Jerrold T Bushberg, J Anthony Seibert, Edwin M Leidholt& John M Boone, Eds . Wolters Kluwer-Lippincott Williams & Wilkins, 2011
- Farr's Physics for Medical Imaging. 2nd Edition. Penelope Allisy-Roberts & Jerry Williams. Elsevier Mosby, 2007
- Clark's Positioning in Radiography. 12th Edition. A Stewart Whitley, Charles Sloane, Graham Hoadley, Adrian D Moore & Chrissie W Alsop. Taylor & Francis, 2005
- Thomson Delmar Radiographic Positioning & Procedures Pocket Guide. 3rd Edition. Richard Carlton, Joanne S Greathouse& Arlene McKenna Adler . Cengage, 2014
- Anatomy for Diagnostic Imaging. 3rd Edition. Stephanie Ryan. Saunders Elsevier, 2010
- Chapman &Nakielny's Guide to Radiological Procedures. 6th Edition. Nick Watson. Saunders Elsevier, 2013

Recommended Reading for the second part topics:

- Diagnostic Imaging: Breast. 2nd Edition. Wendie Berg, Wei Tse Yang. Amirsys, 2013
- Teaching Atlas of Mammography. 4th Edition. Laszlo Tabar, Peter B Dean &Tibot Tot. Thieme, 2011Diagnostic Imaging : Abdomen. 2nd Edition. Michael Federle. Amirsys, 2009
- CT & MRI of the Abdomen and Pelvis : A Teaching File. 3rd Edition. Pablo B Ros&Koenraad J Mortele, Eds. Wolters Kulwer- Lippincott Williams & Wilkins, 2013
- Diagnostic Imaging of the Head &Neck : MRI with CT & PET Correlations. Anton N Hasso. Wolters Kluwer- Lippincott Williams & Wilkins, 2011
- Orthopedic Imaging, A practical approach, 6th Edition. Adam Greenspan & Javier Beltran. Wolters Kluwer, 2014
- Diagnosis of Bone and Joint Disorders, 4th Edition. Donald L Resnick. W.B. Saunders , 2002
- MRl in Orthopedic & Sports Medicine. 3rd Edition. David S Stoller Ed.. Wolters Kluwer- Lippincott Williams & Wilkins. 2007
2012
- Imaging of Arthritis and Metabolic Bone Disease. Barbara Weissman. Elsevier Health Sciences, 2009
- Metabolic Bone Disease. Rosenthal, D.I., In: The Radiologic Clinics of North

America, volume 29, No.l, January 1991.
- A-Z of Musculoskeletal and Trauma Radiology. James R D Murray, Erskine J Holmes & Rakesh R Misra. Cambridge University Press, 2008
- MRI of the Musculoskeletal System. 6th Edition. Thomas H Berquist. Wolters Kulwer-Lippincott Williams & Wilkins, 2012
- Musculoskeletal Imaging: Case Review Series. 2nd Edition. Joseph Yu & Joseph S Yu. Mosby Elsevier, 2008
- Osborn's Brain. Anne G Osborn. Amirsys, 2012
- Diagnostic Cerebral Angiography.2nd Edition Anne G Osborn. Lippincott - Williams & Wilkins 1999
- Clinical Neuroanatomy. 7th Edition. Richard S Snell. Wolters Kluwer-Lippincott Williams & Wilkins, 2010
- Magnetic Resonance Imaging of the Brain & Spine, 4th Edition. Scott W Atlas. Wolters Kluwer-Lippincott Williams & Wilkins, 2009
- Diagnostic Imaging : Spine . 3rd Edition. Jeffrey s Ross & Kevin R Moore. Amirsys, 2015
- A Practical Guide to Ultrasound in Obstectrics and Gynecology.2nd Edition. Eric E Sauerbrei, Khanh Nguyen, & R L Nolan. Lippncott - Raven, 1997.
- Prenatal Diagnosis of Congenital Anomalies. Roberto Romero. Appleton & Lange, 2000
- Diagnostic Imaging: Obstetrics.2nd Edition. Paula J Woodward, Anne Kennedy, Roya Sohaey. Amirsys, 2011
- Diagnostic Imaging: Gynecology.2nd Edition. Akram M Shaaban, Ed. Amirsys, 2014
- Pediatric Imaging : Case Review Series. 2nd Edition. Thierry AGM Huisman. Mosby Elsevier, 2010
- Caffey's Pediatric Diagnostic Imaging. 12th Edition. Brain D Coley, Ed. Elsevier Saunders, 2013
- Chest Radiology, The Essentials, Jannette Collins and Eric J Stem, Wolters Kulwer-Lippincott Williams & Wilkins,2008
- Imaging of Diseases of the Chest. 5th Edition. David M hansell, David Lynch, H Page McAdams & Alexander A Bankier. Mosby Elsevier, 2009
- Thoracic Imaging. W Richard Webb & Charles B Higgins. Lippincott Williams &Wilkins, 2011
- Chest Radiology: Plain film patterns and differential diagnosis. 6th Edition. James C Reed. Elsevier Mosby 2010
- Thoracic Imaging : Case Review Series. 2nd Edition. Thersea C McLoud Gerald F Abbott & Phillip M Boiselle. Mosby Elsevier, 2010
- Muller's Diseases of the Lung: Radiologic and Pathologic Correlations. 2nd Edition. Kyoung Soo Lee, Thomas Franquet, Joungho Han & Takeshi Johkoh. Wolters Kluwer-Lippincott Williams & Wilkins, 2011

• Chest Imaging Case Atlas. 2nd Edition. Mark S Parker, Melissa L Rosado-de-Christenson & Gerald F Abbott. Thieme, 2012
• Textbook of Uroradiology.5th Edition. Reed Dunnick, Carl Sandler & Jeffrey Newhouse. Wolters Kluwer-Lippincott Williams & Wilkins, 2012

• Interventional Radiology: A survival Guide. 3rd Edition. David Kessel & Iain Robertson. Churchill Livingstone, 2010
• Handbook of Interventional Radiological Procedures. 4th Edition. Krishna Kandarpa & Lindsay Machan. Wolters Kluwer-Lippincott Williams & Wilkins, 2010
• Vascular & Interventional Radiology :The requisites. 2nd Edition. John A Kaufman & Michael J Lee. Elsevier Saunders, 2013
• Image-Guided Interventions. 2nd Edition. Matthew A Mauro, Kieran PJ Murphy, Kenneth R Thomson, Anthony C Venbrux& Robert A Morgan.
P A Saunders, 2014
• Grainger & Allison's Diagnostic Radiology, 6th Edition .Andy Adam, Adrian K Dixon, Jonathan H Gillard & Cornelia Schaefer-Prokop, Eds. Elsevier Health Sciences, 2014

Web Sites to Search:

WWW. RADIOPAEDIA.ORG
WWW.AUNTMINNIE.COM
WWW.RSNA.ORG
WWW.RADIOLOGY.RSNAJNLS.ORG
WWW.RADIOGRAPHIC.RSNAJNLS.ORG
WWW.MYSTATDX.COM
WWW.ACR.ORG

Signature

Head of the department

Vice Dean for research and postgraduate study