Master (MSC) Degree Program and Courses Specifications for Radio diagnosis

(According to currently applied credit points bylaws)

Name of department

Faculty of medicine

Assiut University

2022 – 2023

Contents	
Item	***Page***
Program Specification For Radio diagnosis, 2022 - 2023*/2023/2024* **A. Basic Information**	**3**
B. Professional Information **1. Program aims** **2. Intended learning outcomes (ILOs) for the whole program** **3. Program academic standards** **4. Program external references** **5. Program structure and contents** **6. Courses contents (Annex 1)** **7. Admission requirements** **8. Progression and completion requirements** **9. Assessment methods and rules** **10. Program evaluation** **11. Declaration**	**4**
-Annex 1, Courses/ specifications	**19**
Basic science courses **Course 1: Radiological Physics.**	**20**
Course 2: Radiological Technology	**29**
Course 3: Radiological Anatomy	**42**
Course 4: Radiobiology and radiological services	**48**
Course 5: Internal Medicine& General Surgery& Pathology	**56**
Speciality Course **Course 6: Radiodiagnosis.**	**86**
- Annex 2, Program academic standards	**143**
- Annex 3, Teaching methods	**148**
- Annex 4, Assessment methods	**151**
- Annex 5, Program evaluation tools **- Annex 6 Matrixes:** **I-General Academic reference standards (GARS) for postgraduates versus Program ARS** **1-Graduate attributes** **2-Academic Standards** **II-Program ARS versus program ILOs** **III- Program Matrix.**	**155** **157**
- Annex 7, Additional information.	**174**

Master degree of Radio-diagnosis

A. Basic Information

- Program Title: Master degree of radio-diagnosis
- Nature of the program: Single.
- Responsible Department: Department of Radiology
- Program Academic Director (Head of the Department):
  Prof. Mostafa Hashem

  Coordinator (s):
  - Principle coordinator: Prof. Gehan Sayed Ahmed
  -Assistant coordinator (s): Dr. Mohamed Abdel-Tawab

- Internal evaluators: Prof. Dr Afaf Abdel Kader
- External evaluator: Prof. Dr Amr Hamdy Helmy Morsy
  Prof. Dr Osman AbouElcibaa Osman Ismail
- Date of Approval by the Faculty of Medicine Council of Assiut University: 13-11-2017
- Date of most recent approval of program specification by the Faculty of Medicine Council of Assiut University: 27-11-2022
- Total number of Courses; 6 courses:
  First part: 5 courses
  Second part: 1 course

B. Professional Information

1- Program aims

1. To provide the candidates with an educational experience in the understanding of the indications for examinations and familiarity with the principles and limitation of studies, including benefit and risk to the patient.
2. To be Familiar with the anatomy, physiology, path-physiology and post therapeutic findings which may be identified through general radiology examination.
3. To enable candidates to understand technology and techniques of radiology.
4. Learn skills needed for effective physician consultation and communication.
5. To enable candidates to acquire the knowledge of Criteria for radiographic exposure and positioning and effective communication with radiographic technologists and other department personnel.
6. To Know Fluoroscopic techniques and its uses.
7. Understand the technical principles of US, CT and MRI.
8. Develop skill in protocolling, monitoring, and interpreting cross-sectional imaging examination.
9. Be able to monitor all CT exams and determine if additional imaging is needed before the examination is completed.
10. Communicate with patients in proficient manner for both information gathering and for diminishing the burden of the disease.
11. Know indications and contra-indications of contrast studies as well as the performance of these studies, risks and benefits for the patient and alternatives.
12. Knows and apply the basic and clinically supportive science which is appropriate to different radiological findings.
13. Be able to dictate accurate, concise reports.

14. Demonstrate the ability to effectively present cases in a conference.
15- To introduce candidates to the basics of scientific medical research.

2- Intended learning outcomes (ILOs) *for the whole program*:

2/1Knowledge and understanding:

A. Explain the essential facts and principles of relevant basic sciences including, Pathology, Radiological Physics, Radiological Technology , radiological anatomy, Radiobiology and Radiological service related to Radio-diagnosis.
B. Mention essential facts of clinically supportive sciences including –General Surgery and Internal Medicine related to Radio-diagnosis.
C. Demonstrate sufficient knowledge of etiology, clinical picture, diagnosis, prevention and treatment of common diseases and situations related to Radio-diagnosis.
D. Give the recent and update developments in the pathogenesis, diagnosis, prevention, and treatment of common diseases related to Radio-diagnosis.
E. Mention the basic ethical and medicolegal principles that should be applied in practice and are relevant to the Radio-diagnosis.
F. Mention the basics and standards of quality assurance to ensure good clinical practice in the field of Radio-diagnosis.
G. Mention the ethical and scientific principles of medical research methodology.
H. State the impact of common health problems in the field of Radio-diagnosis on the society and how good clinical practice improve these problems.

2/2 Intellectual outcomes

A. Correlate the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common diseases of the Radio-diagnosis.
B. Demonstrate an investigatory and analytic thinking approach (problem solving) to common clinical situations related to Radio-diagnosis.
C. Design and /or present a case or review (through seminars/journal clubs.) in one or more of common clinical problems relevant to the field Radio-diagnosis.
D. Formulate management plans and alternative decisions in different situations in the field of the Radio-diagnosis.

2/3 Skills

2/3/1 Practical skills (Patient Care)

A. Obtain proper history and examine patients in caring and respectful behaviors.
B. Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment for common conditions related to Radio-diagnosis.
C. Carry out patient management plans for common conditions related to Radio-diagnosis.
D. Use information technology to support patient care decisions and patient education in common clinical situations related to Radio-diagnosis.
E. Perform competently noninvasive and invasive procedures considered essential for the Radio-diagnosis.
F. Provide health care services aimed at preventing health problems related to Radio-diagnosis.
G. Provide patient-focused care in common conditions related to Radio-diagnosis. while working with health care professionals, including those from other disciplines

H-Write competently all forms of patient charts and sheets including reports evaluating these charts and sheets (Write a consultation note, inform patients of a diagnosis and therapeutic plan, completing and maintaining medical records)

2/3/2 General skills

Including:

- Practice-based Learning and Improvement
- Interpersonal and Communication Skills
- Professionalism
- Systems-based Practice

Practice-Based Learning and Improvement

A. Perform practice-based improvement activities using a systematic methodology (share in audits and risk management activities and use logbooks).
B. Appraises evidence from scientific studies.
C. Conduct epidemiological Studies and surveys.
D. Perform data management including data entry and analysis using information technology to manage information, access on-line medical information; and support their own education.
E. Facilitate learning of students and other health care professionals including their evaluation and assessment.

Interpersonal and Communication Skills

F. Maintain therapeutic and ethically sound relationship with patients.

G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.

I. Work effectively with others as a member of a health care team or other professional group.

Professionalism

J. Demonstrate respect, compassion, and integrity, a responsiveness to the needs of patients and society

K. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices

L. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

Systems-Based Practice

M. Work effectively in relevant health care delivery settings and systems including good administrative and time management.

N. Practice cost-effective health care and resource allocation that does not compromise quality of care.

O. Assist patients in dealing with system complexities.

3- Program Academic Reference Standards (ARS) (Annex 2)

Academic standards for master degree in Radio-diagnosis.

Assiut Faculty of Medicine developed master degree programs' academic standards for different clinical specialties.
In preparing these standards, the General Academic Reference Standards for post graduate programs (GARS) were adopted. These standards set out the graduate attributes and academic characteristics that are expected to be achieved by the end of the program. These standards were approved by the Faculty Council on **17-6-2009**. These standards were revised and approved without changes by Faculty Council on **23-9-2014** and 27-11-2022.

4- Program External References (Benchmarks)

1. ACGME (Accreditation Council for Graduate Medical Education).
https://www.acgme.org/specialties/radiology/overview/
2. American College of Radiology (ACR).
http://www.acr.org/

Comparison between program and external reference		
Item	**Radio diagnosis Department**	**American College of Radiology (ACR).**
Goals	Matched	Matched
ILOS	Matched	Different
Duration	3-5 years	Different
Requirement	Different	Different
Program structure	Different	Different

5. Program Structure and Contents

A. Duration of program: **3 – 5 years**
B. Structure of the program:
Total number of credit point: 180 (20 out of them for thesis)
Didactic 40 (22.2 %), practical 120 (66.7%), thesis 20 (11.1%) total 180.
First part
Didactic 14 (35 %), practical 24 (60 %), elective course 2 CP (5%), total 40
Second part
Didactic 24, (20% %) practical 96 (80 %) total 120
According to the currently applied credit points by laws:
Total courses 160 credit points.
Compulsory courses: 98.75%
Elective course: 2 credit point =1.25%

	Credit points	% From total
Basic science courses	24	13.3%
Humanity and social courses	2	1.1%
Speciality courses	134	74.5%
Others (Computer, …)		
Field training	120	66.7%
Thesis	20	11.1%

C. Program Time Table

A. Duration of program 3 years maximally 5 years divided into

- **Part 1: (One year)**
  Program-related Basic science courses and ILOs
  Students are allowed to sit the exams of the courses after 18 months from applying to the MSc degree. One elective course can be set during either the 1st or 2nd parts.
- **Thesis**
  For the M Sc thesis;
  MSc thesis subject should be officially registered within 6 months from application to the MSc degree,
  Discussion and acceptance of the thesis could be set after 12 months from registering the MSc subject;
  It should be discussed and accepted before passing the second part of examination)
- **Part 2 (2 years)**

Program –related Speciality courses and ILOs
Students are not allowed to sit the exams of these courses before 3 years from applying to the MSc degree.
The students pass if they get 50% from the written exams and 60% from oral and clinical/practical exams of each course and 60% of summation of the written exams, oral and clinical/practical exams of each course
Total degrees 1900 marks.
700 marks for first part
1200 for second part
Written exam 40% - 70%.
Clinical/practical and oral exams 30% - 60%.

Curriculum Structure: (Courses):

Courses and student work load list	Course Code	Core CREDIT POINTs		
		Lectures	training	total
First Part				
Basic science courses				
Course 1: Radiological Physics.	RAD228A §	2.5	-	2.5
Course2: Radiological Technology	RAD228B	1	1	2
Course 3: & Radiological Anatomy	RAD228C	1	1	2
Course 4: Radiobiology and radiological services	RAD227	1.5	-	1.5
General clinical compulsory courses (6 points)				
Course 5: Internal Medicine& General Surgery& Pathology	RAD228D#			6
Unit 1: Internal Medicine		2		
Unit 2 General Surgery		2		
Unit 3 Pathology		2		
Elective courses*	2 credit points			
Clinical training and scientific activities:				
Clinical training in General Clinical compulsory courses (10 CP)				
Internal Medicine& General Surgery& Pathology	RAD228D#			10
Unit 1: Internal Medicine			5	
Unit 2 General Surgery			5	
Unit 3 Pathology			-	

Clinical training and scientific activities in Speciality course (14 CP) Course 6 : Radio diagnosis	RAD228E			
Total of first part		16	24	40
Second Part	Speciality courses 24 CP Speciality Clinical Work 96 CP			
Speciality Courses **Course 6 : Radio diagnosis**	RAD228E	24		
Training and practical activities in speciality (96 CP)			96	
Total of the second part		**24**	**96**	**120**
Thesis	**20 CP**			
Total of the degree	**180**			

* Elective courses can be taken during either the 1st or 2nd parts.

Student work load calculation:

Work load hours are scheduled depending on the type of activities and targeted competences and skills in different courses

Elective Courses#:

- Medical statistics.
- Evidence based medicine.
- Medicolegal Aspects and Ethics in Medical Practice and Scientific Research
- Quality assurance of medical education
- Quality assurance of clinical practice.
- Hospital management

One of the above-mentioned courses are prerequisites for fulfillment of the degree.

Thesis:

20 CP are appointed to the completion and acceptance of the thesis.

Course 6: Radio diagnosis

Modules/ Units' Titles' list	% from total CREDIT POINTS
Course 6: Radio diagnosis Module or unit 1: Gastrointestinal tract	15%
Module or unit 2: Genito-urinary tract	15%
Module or unit 3 : Neuroradiology, head and neck.	20%
Module or unit 4: US	15%
Module or unit 5 Musculoskeletal system.	15%
Unit (module) 6 Chest and cardio-vascular system	20%
Total number of units = 6	**100%**

6. Courses Contents (Annex 1)

The competency-based objectives for each course/module/rotation are specified in conjunction with teaching/training methods, requirements for achieving these objectives and assessment methods.

See Annex 1 for detailed specifications for each course/ module

7-Admission requirements

- **Admission Requirements (prerequisites) if any:**
  - **I. General Requirements:**
    - a. MBBCh Degree from any Egyptian Faculties of Medicine
    - b. Equivalent Degree from medical schools abroad approved by the Ministry of Higher Education
  - **II. Specific Requirements:**
    - Fluent in English (study language)

VACATIONS AND STUDY LEAVE

The current departmental policy is to give working residents 2 week leave prior to first/ second part exams.

FEES:

As regulated by the postgraduate studies rules and approved by the faculty vice dean of post graduate studies and the faculty and university councils.

8-Progression and completion requirements

- Examinations of the first part could be set at 18 months from registering to the MSc degree.
- Examination of the second part cannot be set before 3 years from registering to the degree.
- Discussion of the MSc thesis could be set after 1 year from officially registering the MSc subject before setting the second part exams.
- The minimum duration of the program is 3 years.

The students are offered the degree when:

1. Passing the exams of all basic science, elective and Speciality courses of this program as regulated by the post graduates approved rules by the faculty council.
2. Completing all scheduled CP and log book (minimum 80%).
3. Discussion and acceptance of the MSc thesis.

9- Program assessment methods and rules (Annex IV)

Method	ILOs measured
Written examinations: Structured essay questions Objective questions: MCQ Problem solving	K & I
Clinical: Long/short cases OSCE	K ,I, P &G skills
Structured oral	K ,I &G skills
Logbook assessment	All
Research assignment	I &G skills

Weighting of assessments:

Courses	Course Code	Degrees			
		Written Exam	*Oral Exam* *	Practical / Clinical Exam	Total
First Part					
Course 1 Radiological Physics.	RAD228A	75	50	-	125
Course 2 Radiological Technology	RAD228B	50	25	25	100
Course 3 : Radiological Anatomy	RAD228C	50	25	25	100
Course 4 : Radiobiology and radiological services	RAD227	40 (15+25)	35 (15-20)	-	75 (30- 45)
Course 5: Internal Medicine& General Surgery& Pathology	RAD228D#	150	75	75	300
Unit 1: Internal Medicine Unit 2 General Surgery Unit 3 Pathology		45 45 60	17.5 17.5 40	37.5 37.5 -	100 100 100
Total of the first part					700
Second Part					
Speciality Courses:					
Course 6 Radio diagnosis PAPER 1 PAPER2 PAPER 3 PAPER 4	RAD228E	480 120 120 120 120	360	360	1200
Total of second part			360	360	1200

* 25% of the oral exam for assessment of logbook

700 marks for first part

1200 for second part

Written exam 40% (480 marks).

Clinical /practical and oral exams 60% (720 marks)

Examination system:

➢ First part:

- Written exam 3 hours in Physics + Oral exam
- Written exam 2 hours in Radiological techniques+ Oral exam including assessment of practical skills
- Written exam 2 hours in radiological anatomy+ Oral exam including assessment of practical skills
- Written exam 3 hours in Radiobiology + Radiological services + Oral exam including assessment of practical skills.
- Written exam 3 hours in internal medicine + General surgery + Pathology + Oral exam+ Clinical exam.

➢ Second part:

- Written exam Four papers 3 hours for each in Radio diagnosis + Oral exam+ Clinical exam.

10-Program evaluation

By whom	Method	sample
Quality Assurance Unit	Reports Field visits	#
External Evaluator (s):According to department council External Examiner (s): According to department council	Reports Field visits	#
Stakeholders	Reports Field visits Questionnaires	#
Senior students	Questionnaires	#
Alumni	Questionnaires	#

#Annex 5 contains evaluation templates and reports (Joined in the departmental folder).

11-Declaration

We certify that all of the information required to deliver this program is contained in the above specification and will be implemented.
All course specifications for this program are in place.

Contributor	Name	Signature	Date
Program Principle Coordinator:	**Prof. Gehan Sayed Ahmed**		**4/2022**
Head of the Responsible Department (Program Academic Director):	**Prof. Mostafa Hashem**		**4/2022**

Annex 1, Specifications for Courses / Modules

Annex 1: specifications for courses/

First Part

Course 1 Radiological Physics

Name of department:
Faculty of medicine
Assiut University
2022 - 2023

1. Course data

- **Course Title: Radiological Physics**
- **Course code: RAD228A §**
- **Speciality: Radio diagnosis**
- **Number of credit points: Didactic** 2.5 **(100%) practical** 0 **(0%). total** 2.5 **credit points**
- **Department (s) delivering the course: Physics department Faculty of science, Assiut-Egypt.**

- **Coordinator (s):**
  - **Course coordinator: Prof. Abd El Hady Mohamad Assistant coordinator (s) Prof. Abd Al-Aziz Abu elfadel Abd Al-Aziz**
- **Date last reviewed: 4/2022**
- **General requirements (prerequisites) if any : None**
- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Course Aims

- To provide the candidates with the skills to assume responsibility for the appropriate utilization of imaging studies.
- To familiarize the candidates with the circuitry of an x-ray unit, x-ray tube, x-ray production, nature of x-rays, inverse square law, half-value layer, as well as to detect defects interfering with the proper function of the equipment and the fundamentals of preventive maintenance.
- To provide the candidates with knowledge about hazards of radiation, how to avoid unnecessary exposure of radiation, lead protection, lead limit of x-ray Rooms/ Department to ensure safe practice of radiology, especially in daily application of radiation, safety measures and in all other facets of patient safety during imaging.

3. Intended learning outcomes (ILOs):

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. **List the Basic science of** 1-structure of the atom: 2- electromagnetic radiation: 3-Particulate radiation:	-Didactic lectures. -Direct observation	-written and oral examination -Global rating. Log book
B. **Describe the details of:** -Interaction of radiation with the matter: *Charged particle interaction. *Neutron interaction. *Photon interaction. *Photon attenuation.		
C. **Describe:** -Radiation units: *System of units. *Exposure. *Absorbed dose. *Equivalent dose. *Effective dose. - X-ray production. *Properties of X-ray. *Characteristic radiation.		
D. Define types of -Generators: *Single phase. *Three phase. *High frequency. Technique factors		

E. Illustrate **-Fluoroscopy:** -system components. -Image intensifier.		
F. Describe Computed tomography: -system components. -system types. -image acquisition parameters. -image formation. -modes of operation. -image characteristics and artifacts.		
G. Illustrate the Magnetic resonance imaging: -magnetism and magnetic field. -Type of magnetic materials. -Magnetic field and excitation. -Pulse sequences. -MR instrumentation. -Image acquisition. -Contrast agent.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of Radiological Physics with clinical reasoning, diagnosis and management of common diseases related to Radio diagnosis.	-Didactic (lectures, seminars, tutorial)	-Written and oral examination -Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Radio diagnosis.		

C- Practical skills = 0

D- General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	Observation and supervision. -Written and oral communication.	-Portfolios
B. Appraises evidence from scientific studies(journal club)		
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain therapeutic and ethically sound relationship with patients.	Observation and supervision. -Didactic.	Global rating Portfolios Record review
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present an Article in Common condition mentioned in A.A:A.G		
K. Write a report: in Common condition mentioned in A.A:A.G		
L. Council patients and families about the effect of radiation.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation and supervision. -Didactic.	Global rating
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems.	Observation and supervision. -Didactic.	Portfolios -Global rating
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		
R. Assist patients in dealing with system complexities.		

Course contents (topic s/modules/rotation
Course Matrix

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge A	Intellectual B	Practical skill C	General Skills D
Basic science of structure of the atom, electromagnetic radiation and Particulate radiation	**A**	**A,B**	**-**	**A-R**
Interaction of radiation with the matter	**B**	**A,B**	**-**	**A-R**
Radiation units and, Properties of X-ray	**C**	**A,B**	**-**	**A-R**
Types of Generators and Technique factors	**D**	**A,B**	**-**	**A-R**
Fluoroscopy	**E**	**A,B**	**-**	**A-R**
Computed tomography	**F**	**A,B**	**-**	**A-R**
Magnetic resonance imaging	**G**	**A,B**	**-**	**A-R**

5. Course Methods of teaching/learning:

1. Didactic (lectures, seminars, tutorial)
2. Observation
3. Written & oral communication

6. Course Methods of teaching/learning: for students with poor achievements

1. Extra Didactic (lectures, seminars, tutorial) according to their needs

7. Course assessment methods:

i. Assessment tools:

1- Written examination
2- Oral examination
3- Logbook

ii. Time schedule: At the end of the first part

iii. Marks: 125

8. List of references

i. Lectures notes

- Staff members print out of lectures and/or CD copies

ii. Recommended books

- Christensen's in physics.

9. Signature

Course Coordinator: **Prof. Abd El Hady Mohamad**	**Head of the Department:** **Prof. Mostafa Hashem**
Date: 4/2022	**Date: 4/2022**

Course 2 Radiological Techniques

Name of department:
Faculty of medicine
Assiut University
2022 - 2023

1. Course data

- **Course Title: Radiological Techniques**
- **Course code: RAD228B**
- **Speciality: Radio diagnosis**
- **Number of CP: Didactic 1 (50%) practical 1(50%) .total 2 .**
- **Department (s) delivering the course: Radiology departments faulty of medicine -Assiut-Egypt.**
- **Coordinator (s):**
  - **Course coordinator: Prof. Gehan Sayed Ahmed**
    Assistant coordinator (s) Dr Mohamed Abdel-Tawab
- **Date last reviewed: 4/2022.**
- **General requirements (prerequisites) if any : None**
- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Course Aims

-Study of the general foundation of positioning technique to obtain radiographic demonstration of anatomical structure of interest as well as specialized radiographic examinations of the different body structures and organs without contrast media. This includes anatomic and radiographic positioning terms, source-image-receptor distance and tube-film alignment, positioning principles, radiographic landmarks, exposure technique, structures demonstrated, and evaluation criteria of examinations of the different organs and body structures. Clinical competency is accomplished through positioning demonstration.

-To be familiar with the anatomy of the MSK.

-Develop comprehensive understating of normal neuro-CT anatomy (including brain, para-nasal sinuses, temporal bones, orbits, neck and spine) and be able to recognize normal variant.

-Learn the candidates that An atlas of cross sectional anatomy should be consulted when there is any doubt.

3. Intended learning outcomes (ILOs):

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Describe the appearance of genitourinary structures on basic imaging modalities: -Plain film. -IVU -Voiding cystourethrography. -Interpret basic cross sectional genitourinary tract anatomy on CT/ CT urography and MRI/MR urography.	-Didactic lectures. -Direct observation	-written and oral examination -Global rating. Log book
B. Illustrate learning of the normal radiographic anatomy, CT and MRI anatomy of the axial and appendicular skeleton.		
C. Define normal anatomy of: -Chest-X-ray: as regard: *Identify the structures on PA and lateral chest radiograph. -CT anatomy. -CT angiography. -Vascular anatomy.		
D- Describe normal anatomic features and variant: -Abdominal plain film: - Normal anatomy. - Gas and soft tissues. - Abdominal calcification. - GIT in barium studies. -Cross sectional imaging for the: - Abdomen and peritoneal cavity. - Retro-peritoneal spaces and planes. -Vascular anatomy and variant: abdominal aorta and		

mesenteric vessels.		
E- Give detailed knowledge of intra-cranial anatomy as displayed on multi-planar images.		
F- Give knowledge about the complex anatomy of the orbit, temporal bone, skull base, soft tissue of the neck as displayed on CT		
G- - Give knowledge about normal osseous structures of the spine, inter-vertebral disc, support ligaments and the contents of thecal sac (spinal cord and nerve roots) on CT and MRI.		
H- Draw the vascular anatomy of the cerebral circulation.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of Radiological Techniques, and Radiological Anatomy with clinical reasoning, diagnosis and management of common diseases related to Radio diagnosis.	-Didactic (lectures, seminars, tutorial)	-Written and oral examination -Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Radio diagnosis.		

C- Practical skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Master the basic skills in the Radiological Techniques, and Radiological Anatomy related to Radio diagnosis.	Laboratory work	-Assessment of practical skills -Logbook
B. Use information technology to support decisions related to Radiological Techniques, and Radiological Anatomy in Radio diagnosis.	Laboratory work	Assessment of practical skills -Logbook
C. Prepare to screen patients who are at risk from injection of contrast material.	Didactic lectures. -Practical work	written examination. -Oral examination -Assessment of practical skills
D. Examine the classification, symptoms and signs of contrast reaction and clinical management including appropriate pharmacologic agent and their mode of administration.		
E. Elicit the indications for pre-medication.		
F. USE adequate knowledge and perform: **IVU:** -Indication. -Contra-indication. -Technique. -Preparation. -Preliminary radiographs. -Dose of contrast injected. -Radiographic procedures. -Additional radiographs.		

-Abdominal compression. -Modification of the basic technique. -Complication.		
G. Performs lower urinary tract radiography: -Cystography. -Voiding cysturethrography. -Retrograde urethrography. Ileal conduit/continent reservoir studies		
H. Performs HSG: -Indication. -contrast media used. -Preparation and techniques. -Variation in the basic technique. -Complication.	Rotation in image processing units (CR and dark room). -Direct observation. -Film presentation.	-Log book. -Oral examination.
I- Perform Standard radiographic positioning of the musculoskeletal system. - Routine views. - Specialized views.		
J- Prepare the protocols of CT examination in MSK system: - Axial cuts. - Bone and soft tissue window setting. - IV contrast.		
K- Performs standard patient positioning in chest radiology (routine and special views).		
L- Prepare and performs the protocols of CT chest examination: - Thin section. - High resolution. - Expiratory images. - Prone images. - Use of IV contrast.		

- Multi-detector CT. - CT angiography. Knows and perform contrast venous system examination (Phlebography): - Indication and contra-indication and different techniques.		
M-Performs the different radiographic positioning for pharynx, esophagus and abdomen. learns and performs barium swallow: - Indications. - Contra-indications. - Single contrast examination. Basic technique. Dynamic studies. Modification of basic technique. -Double contrast barium swallows. -Pediatric swallow. -Bread barium swallow. -Naso-pharyngography. - Recognizes and performs oral contrast studies for the stomach: -Barium examination: Indication and contraindication. Barium suspension. Hypotonic agent. Examination technique. Variation in basic technique. -Hypotonic duodenography. -Water soluble contrast studies.		
N- Conduct contrast studies for small bowel: -Plain abdominal radiography. In suspected cases of perforation or obstruction. -Barium studies -Barium follow through. -Small bowel enema.		
O-Use techniques and performs contrast studies for		

the colon. -Double contrast barium enema. -Indication for single and double contrast barium enema. -Techniques of double and single contrast enema. -Variation of basic techniques: -Colostomy enema. -Instant barium enema. -Water soluble enema. -Therapeutic enema. -Complication of examination. -Knows and perform: -Fistulogram. -Loop-agrams. - US examination.		
P-Apply the protocols of the others different imaging modalities: -CT examination: -Procedure: preparation. -Oral contrast agent. -CT enema examination. -IV contrast agent. -Tri-phasic CT dynamic study. -CT-angiogram. -US examination. -MRI examination and MR cholangiography.		
Q-Conduct standard radiographic positioning of the Skull and skull base. Knows and perform different radiographic positioning for para-nasal sinuses. Knows and apply CT protocols for sino-nasal cavity. Knows different radiological positioning and CT examination of temporal bone and orbit. Knows and perform different radiological positioning and cross sectional imaging for facial bones, mandible and dental radiography.		

Recognize different radiographic positioning for spine (routine and special views). -Know and apply protocol of CT and MRI examination as regard CT Imaging parameters including window and level settings, slice thickness, inter-slice gap, helical imaging parameters and image reconstruction algorithm. -Learns the typical CT density of commonly occurring processes: such as edema, air, calcium, blood and fat. MRI: -Identify commonly used pulse sequences. Learn the intensity of normal tissues on routine pulse sequences.		

D- General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	Observation and supervision. -Written and oral communication.	-Portfolios
B. Appraises evidence from scientific studies(journal club)		
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain therapeutic and ethically sound relationship with patients.	Observation and supervision. -Didactic.	Global rating Portfolios Record review
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present an Article in image processing.		
K. Write a report About -Image quality and isotope scanning. - Report image to technologist for correction, if inadequate for evaluation.		
L. Council patients and families about the effect of radiation.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation and supervision. -Didactic.	Global rating
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems.	Observation and supervision. -Didactic.	Portfolios -Global rating
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		
R. Assist patients in dealing with system complexities.		

Course contents (topic s/modules/rotation
Course Matrix

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skill	General Skills
Appearance of genitourinary structures on basic imaging modalities	**A**	**A, B**	**A-H**	**A-R**
Normal radiographic anatomy, CT and MRI anatomy of the axial and appendicular skeleton.	**B**	**A, B**	**A-E, I, J**	**A-R**
Normal anatomy of Chest-X-ray	**C**	**A, B**	**A-E, K, L**	**A-R**
Normal anatomic features and variant of abdomen	**D**	**A,B**	**A-E, M-P**	**A-R**
Intra-cranial anatomy	**E**	**A,B**	**A-E,Q**	**A-R**
Anatomy of the orbit, temporal bone, skull base, soft tissue of the neck on CT	**F**	**A,B**	**A-E,Q**	**A-R**
Normal osseous structures of the spine, inter-vertebral disc, support ligaments and the contents of thecal sac (spinal cord and nerve roots) on CT and MRI.	**G**	**A,B**	**A-E,Q**	**A-R**
vascular anatomy of the cerebral circulation.	**H**	**A,B**	**A-E,Q**	**A-R**

5. Course Methods of teaching/learning:

1. Didactic (lectures, seminars, tutorial)
2. Observation
3. Written & oral communication

6. Course Methods of teaching/learning: for students with poor achievements

1. Extra Didactic (lectures, seminars, tutorial) according to their needs

7. Course assessment methods:

i. Assessment tools:

1- Written examination
2- Oral examination
3- Assessment of practical skills
4- Log book

ii. Time schedule: At the end of the first part

iii. Marks: 100

8. List of references

i. Lectures notes

- Staff members print out of lectures and/or CD copies

ii. Recommended books

- **Clark's: positioning in radiography.**
- **Bontrager's Hand book of Radiographic positioning and Technique 8th edition, 2013**
- **T. Holm PES Palmer E. Lehtinen Manual of radiographic technique 2002.**

iii. Periodicals, Web sites, … etc

- Radiology journal.
- Radiologic clinics of North America

9. Signature

Course Coordinator: **Prof. Gehan Sayed Ahmed**	**Head of the Department:** **Prof. Mostafa Hashem**
Date: 4/2022	**Date: 4/2022**

Course 3 Radiological Anatomy

Name of department:
Faculty of medicine
Assiut University
2022 - 2023

1. Course data

- **Course Title: Radiological Anatomy**
- **Course code: RAD228C**
- **Speciality: Radio diagnosis**
- **Number of credit points: Didactic** 1 **(50%) practical 1**(50%) **total 2 .**
- **Department (s) delivering the course: Radiology departments faulty of medicine -Assiut-Egypt.**
- **Coordinator (s):**
  - **Course coordinator: Prof. Prof. Gehan Sayed Ahmed**
    Assistant coordinator (s) Dr Mohamed Abdel-Tawab
- **Date last reviewed: 2022**
- **General requirements (prerequisites) if any : None**
- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Course Aims

- To obtain demonstration of anatomical structure related to radio diagnosis.

3. Intended learning outcomes (ILOs):

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Describe Intra-cranial anatomy & vascular anatomy of the cerebral circulation. Normal Chest X-ray, CT,CT angiography & Cardiovascular anatomy. Normal radiographic, CT and MRI anatomy of the axial & appendicular skeleton. Abdominal plain films, CT & vascular anatomy and variants. Complex CT anatomy of the orbit, temporal bone, skull base, soft tissue of the neck.	-Didactic lectures. -Direct observation	-written and oral examination -Global rating. Log book

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of d Radiological Anatomy with clinical reasoning, diagnosis and management of common diseases related to Radio diagnosis.	-Didactic (lectures, seminars, tutorial)	-Written and oral examination -Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Radio diagnosis.		

C- Practical skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Master the basic skills in Radiological Anatomy related to Radio diagnosis.	Laboratory work	-Assessment of practical skills -Logbook
B. Use information technology to support decisions related to Radiological Anatomy in Radio diagnosis.	Laboratory work	Assessment of practical skills -Logbook

D- General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	Observation and supervision. -Written and oral communication.	-Portfolios
B. Facilitate learning of junior students and other health care professionals.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
C. Work effectively with others as a member of a health care team or other professional group.	Observation and supervision. -Didactic.	Global rating Portfolios Record review
D. Present an Article in image processing.		
E. Write a report About -Image quality and isotope scanning. - Report image to technologist for correction, if inadequate for evaluation.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices	Observation and supervision. -Didactic.	Global rating

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
G. Work effectively in relevant health care delivery settings and systems.	Observation and supervision. -Didactic.	Portfolios -Global rating
H. Practice cost-effective health care and resource allocation that does not compromise quality of care.		

Course contents (topic s/modules/rotation
Course Matrix

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skill	General Skills
Intra-cranial anatomy & vascular anatomy of the cerebral circulation.	**A**	**A,B**	**A,B**	**A-H**
Normal Chest X-ray, CT,CT angiography & Cardiovascular anatomy.	**A**	**A,B**	**A,B**	**A-H**
Normal radiographic, CT and MRI anatomy of the axial & appendicular skeleton.	**A**	**A,B**	**A,B**	**A-H**
Abdominal plain films, CT & vascular anatomy and variants.	**A**	**A,B**	**A,B**	**A-H**
Complex CT anatomy of the orbit, temporal bone, skull base, soft tissue of the neck.	**A**	**A,B**	**A,B**	**A-H**

5. Course Methods of teaching/learning:

1. Didactic (lectures, seminars, tutorial)
2. Observation
3. Written & oral communication
4. Training

6. Course Methods of teaching/learning: for students with poor achievements

1. Extra Didactic (lectures, seminars, tutorial) according to their needs

7. Course assessment methods:

i. Assessment tools:

1- Written examination
2- Oral examination
3- Assessment of practical skills
4- Log book

ii. Time schedule: At the end of the first part

iii. Marks: 100

8. List of references

i. Lectures notes

- Staff members print out of lectures and/or CD copies

ii. Recommended books

- **Clark's: positioning in radiography.**
- **Bontrager's Hand book of Radiographic positioning and Technique 8th edition, 2013**
- **T. Holm PES Palmer E. Lehtinen Manual of radiographic technique 2002.**

iii. Periodicals, Web sites, … etc

- **Radiology journal.**
- **Radiologic clinics of North America**

9. Signature

Course Coordinator: **Prof. Dr. Gehan Sayed Seif**	**Head of the Department:** **Prof. Mostafa Hashem**
Date: 4/2022	**Date: 4/2022**

Course 4 Radiobiology and Radiological Services,

Name of department:
Faculty of medicine
Assiut University
2022 - 2023

1. Course data

- **Course Title: : Radiological services, radiobiology**
- **Course code: RAD227**
- **Speciality: Radio diagnosis**
- **Number of hours Didactic** 1.5 **(100 %) practical** 0.
- **(0 %).total 1.5**.
- **Department (s) delivering the course: Radiotherapy and nuclear medicine and radiology departments faulty of medicine -Assiut-Egypt.**
- **Coordinator (s):**
  - **Course coordinator: Prof. Samia Abd El Karim**
  - **Assistant coordinator (s) Prof. Hisham Moustafa**
  - **Dr. Moustafa El Sharkawy**
- **General requirements (prerequisites) if any : None**
- **Date last reviewed: 4/2022**
- **Requirements from the students to achieve course ILOs are clarified in the joining log book.**

2. Course Aims

- Facilitate an in depth understanding of all imaging modalities and how they form high quality and clinically significant images.
- Understand basic function in nuclear medicine including gamma camera, functional uses and gated principles.
- Understand basic nuclear procedures and indications.
- Know the necessary knowledge to ensure safe practice of radiology, especially in daily application of radiation, safety measures and in all other facts of patient safety during imaging.
- Understand the principles involving action of x-rays on film emulsion and intensifying screens, processing chemicals, the various systems and accessories involved in the conversion of latent image into visible radiographic image following sequential steps in manual and automatic processing, processor operation and maintenance.
- Learns the skills necessary to critique radiographic images with emphasis in recognizing processing faults with the aid of radiographs.
- Make discussions include processing room design and accessories and regulatory requirements.
- Understand and be thoroughly familiar with the clinical indications and limitations of the basic Nuclear Medicine imaging procedures including pulmonary, GI, osseous and CNS organs systems.
- Understand the physical principles of Nuclear Medicine as regard to interaction of radio-pharmaceutical with physiology and interaction of gamma emissions with detector equipment.
- Be familiar with the technical aspects radiopharmaceutical selection and implementation as a problem solving tool in diagnostic Nuclear medicine.

- Be familiar with the technical and physiological aspects of radiopharmaceutical interaction in the body and how these correlate with the pathological situations under diagnostic consideration.

3. Intended learning outcomes (ILOs):

A- Knowledge and understanding

ILOs	**Methods of teaching/ Learning**	***Methods of Evaluation***
A. **List** -Interaction of radiation with the matter: *Charged particle interaction. *Neutron interaction. *Photon interaction. *Photon attenuation.	-Didactic lectures. -Direct observation	-written and oral examination -Global rating. Log book
B. **Describe** *Absorbed dose. *Equivalent dose. *Effective dose.		
C- **Define** Generic image processing: -Pre processing segmentation. -Gray scale processing. -Frequency processing. -Reconstruction. -Image registration.		
D- Illustrate **-Fluoroscopy:** -Real time imaging. -Image processing. **-Direct digital radiography.**		
E-Give Knowledge about		

Computed tomography: -image acquisition parameters. -image formation. -image characteristics and artifacts. -image processing and display.		
F- Describe the Magnetic resonance imaging: -Image acquisition.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of Radiological services, radiobiology and use of isotope in diagnosis with clinical reasoning, diagnosis and management of common diseases related to Radio diagnosis.	-Didactic (lectures, seminars, tutorial)	-Written and oral examination -Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Radio diagnosis.		

C- Practical skills =0

D- General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	Observation and supervision. -Written and oral communication.	-Portfolios
B. Appraises evidence from scientific studies(journal club)		

C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.		

Interpersonal and Communication Skills

ILOs	**Methods of teaching/ learning**	**Methods of Evaluation**
F. Maintain therapeutic and ethically sound relationship with patients.	Observation and supervision. -Didactic.	Global rating Portfolios Record review
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present an Articles in image processing.		
K. Write a report About -Image quality and isotope scanning.		
L. Council patients and families about the effect of radiation.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation and supervision. -Didactic.	Global rating
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems.	Observation and supervision. -Didactic.	Portfolios -Global rating
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		
R. Assist patients in dealing with system complexities.		

Course contents (topics/modules/rotations)
Course Matrix

Time Schedule: First Part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skill	General Skills
Interaction of radiation with the matter	**A**	**A,B**	**-**	**A-R**
Describe effective dose	**B**	**A,B**	**-**	**A-R**
General image processing	**C**	**A,B**	**-**	**A-R**
Fluoroscopy and radiological imaging	**D**	**A,B**	**-**	**A-R**
Computed tomography	**E**	**A,B**	**-**	**A-R**
Magnetic resonance imaging	**F**	**A,B**	**-**	**A-R**

5. Course Methods of teaching/learning:

1. Didactic (lectures, seminars, tutorial)
2. Observation
3. Written & oral communication
4. Training

6. Course Methods of teaching/learning: for students with poor achievements

2. Extra Didactic (lectures, seminars, tutorial) according to their needs

7. Course assessment methods:

i. Assessment tools:

1- Written examination
2- Oral examination
3- Assessment of practical skills
4- Log book

ii. Time schedule: At the end of the first part

iii. Marks: 75

8. List of references

i. Lectures notes

- Staff members print out of lectures and/or CD copies

ii. Periodicals, Web sites, … etc

- American journal of radiology.
- European journal of radiology.
- Radiology journal.
- Radiologic clinics of North America
- Egyptian Journal of radiology

9. Signature

Course Coordinator: **Prof. Samia Abd El Karim**	**Head of the Department:** **Prof: Moustafa Hashem**
Date: 9/2017	**Date:9/ 2017**

Course 5 Internal Medicine and General surgery and Pathology

Unit 1 Internal Medicine

1. Unit data

- **Unit Title: Internal Medicine**
- **Unit code: RAD228D#**
- **Specialty is Radio diagnosis**
- **Number of credit points: didactic 2 (28.6%), practical 5 (71 . 4 %), total 7.**
- **Department (s) delivering the course: Internal Medicine**
- **Coordinator (s): Staff members of Internal Medicine Department in conjunction with Radio diagnosis Department as annually approved by both departments' councils**
- **Date last reviewed: 4/2022**
- **Requirements (prerequisites) if any: None**

2. Unit aim

-To make the students able be familiar with the diagnosis and management of common medical problems that may be encountered with Radio diagnosis.

3. Unit intended learning outcomes (ILOs):

A- Knowledge and understanding

ILOs	**Methods of teaching/ learning**	***Methods of Evaluation***
A. Describe the etiology, clinical picture, diagnosis and management of the following diseases and clinical conditions: • **Medical Emergencies:** Acute renal failure GIT bleeding Pulmonary embolism • **Thyroid** Hypothyroidism Hyperthyroidism Thyroiditis Thyroid malignancies • **Parathyroid** Hyperparathyroidism • **Suprarenal** Cushing Addison's Pheochromocytoma • **Pituitary** Hypopituitarism Acromegaly Gigantism • **Renal:** Chronic renal failure	- Clinical round Seminars Lectures Case presentation Hand on workshops, Clinical rotation in the general medical and emergency Units and CCU	- Written and oral examination - Log book

Golmerulonephritis Pyelonephritis Kidney transplant • **Heart** CAD Angina Infarction Cardiomyopathy • **Respiratory system** Pulmonary embolism Bronchogenic Ca • **GIT:** Liver cirrhosis Jaundice Causes of hepatosplenomegaly		
B. Mention the principles of : Basics of general medicine		
C. State update and evidence based Knowledge of GIT bleeding -Pulmonary embolism -Golmerulonephritis -Pyelonephritis -Kidney transplant -Bronchogenic Ca		
D. Memorize the facts and principles of the relevant basic supportive sciences related to Internal Medicine.		
E. Mention the basic ethical and medicolegal principles that should be applied in practice and are relevant Internal Medicine.		
F. Mention the basics and standards of quality assurance to ensure good clinical practice in the field of in Internal Medicine.		
G. Mention the ethical and scientific principles of medical research methodology.		

H. State the impact of common health problems in the field of Internal Medicine on the society and how good clinical practice improve these problems.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common diseases related to Internal Medicine.	-Clinical rounds Senior staff experience	-Logbook and Portfolios -Procedure and case presentation
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Internal Medicine.		
C. Design and present cases , seminars in Design and /or present a case or review (through seminars/journal clubs.) in one or more of common clinical problems relevant to the field of Internal Medicine.		
D. Formulate management plans and alternative decisions in different situations in the field of the Internal Medicine.		

C-Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Obtain proper history and examine patients in caring and respectful behaviors.	-Clinical round -Seminars -Lectures -Case presentation -Hand on workshops, -Clinical rotation in the general medical and emergency Unit And CCU	-OSCE -log book & portfolio -Clinical exam in internal medicine
B. Order the following non invasive/invasive diagnostic procedures: • Routine appropriate Lab investigations related to conditions mentioned in A.A • ECG • ESR, blood culture. • Echocardiography. • Blood picture • Blood chemistry • Metabolic profile:[i.e. serum electrolytes] • Chest x rays • Endocrinal profile	-Clinical round with senior staff Observation -Post graduate teaching Hand on workshops	-Procedure presentation - Log book - Chick list
C. Interpret the following non invasive/invasive diagnostic procedures • Routine appropriate Lab investigations related	Clinical round with senior staff	Procedure presentation - Log book

to conditions mentioned in A.A • ECG • ESR, blood culture. • Echocardiography. • Blood picture • Blood chemistry • Metabolic profile:[i.e. serum electrolytes] • Chest x rays • Endocrinal profile		- Chick list
D. Perform the following non invasive/invasive Diagnostic and therapeutic procedures. -Abdominal US -ECG	-Perform under supervision of senior staff	Procedure presentation - Log book - Chick list
E. Prescribe the following non invasive/invasive therapeutic procedures -Prescribe proper treatment for conditions mentioned in A.A	Clinical round with senior staff	- Log book - Chick list
F. Carry out patient management plans for common conditions related to Internal Medicine as in mentioned in A.A	Clinical round with senior staff	
G. Use information technology to support patient care decisions and patient education in common clinical situations related to Internal Medicine.		
H-Provide health care services aimed at preventing health problems related to Internal Medicine.		
I-Provide patient-focused care in common conditions related to Internal Medicine, while working with health care professionals, including those from other disciplines like: Conditions mentioned in A.A.		
J. Write competently all forms of patient charts and sheets including reports evaluating these charts and sheets (Write a consultation note, Inform patients of a diagnosis and therapeutic plan, completing and maintaining medical records).		

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(share in audit and risk management activities and use logbook).	-Case log -Observation and supervision -Written & oral communication	Procedure/case presentation -Log book and Portfolios
B. Appraises evidence from scientific studies(journal club)	-Journal clubs - Discussions in seminars and clinical rounds	
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis using information technology to manage information, access on-line medical information; and support their own education.		
E. Facilitate learning of junior students and other health care professionals including their evaluation and assessment.	Clinical rounds Senior staff experience	

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain therapeutic and ethically sound relationship with patients.	Clinical round Seminars Lectures Case presentation	Global rating Procedure/case presentation Log book Portfolios Chick list
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case in common problems related to Internal Medicine.	Clinical round Seminars	Clinical Exam
K. Write a report : ECG report.	Senior staff experience	Chick list
L. Council patients and families about: Conditions mentioned above in A.A.	Clinical round with senior staff	

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Observation Senior staff experience Case taking	1. Objective structured clinical examination 2. Patient survey
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		1. 360o global rating
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		1. Objective structured clinical examination 2. 360o global rating

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems including good administrative and time management.	Observation Senior staff experience	1. 360o global rating
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		1. Check list evaluation of live or recorded performance
R. Assist patients in dealing with system complexities.		1. 360o global rating 2. Patient survey

4. Unit contents (topic s/modules/rotation
Unit Matrix

Time Schedule :first Part

Topic	Covered ILOs			
	Knowledge A	Intellectual B	Practical skill C	General Skills D
1 Cardiology				
• Medical Emergencies:	A,D-H	A-D	A-J	A-R
Acute renal failure	A,D-H	A-D	A-J	A-R
GIT bleeding	A,C,D-H	A-D	A-J	A-R
Pulmonary embolism	A,C,D-H	A-D	A-J	A-R
Thyroid				
Hypothyroidism	A,D-H	A-D	A-J	A-R
Hyperthyroidism	A,D-H	A-D	A-J	A-R
Thyroiditis	A,D-H	A-D	A-J	A-R
Thyroid malignancies	A,D-H	A-D	A-J	A-R
• Parathyroid				
Hyperparathyroidism	A,D-H	A-D	A-J	A-R
• Suprarenal	A,D-H	A-D	A-J	A-R
Cushing	A,D-H	A-D	A-J	A-R
Addison's	A,D-H	A-D	A-J	A-R
Pheochromocytoma	A,D-H	A-D	A-J	A-R
• Pituitary	A,D-H	A-D	A-J	A-R
Hypopituitarism	A,D-H	A-D	A-J	A-R
Acromegaly	A,D-H	A-D	A-J	A-R
Gigantism	A,D-H	A-D	A-J	A-R
• Renal:	A,D-H	A-D	A-J	A-R
Chronic renal failure	A,D-H	A-D	A-J	A-R
Golmerulonephritis	A,C,D-H	A-D	A-J	A-R

Pyelonephritis	A,C,D-H	A-D	A-J	A-R
Kidney transplant	A,C,D-H	A-D	A-J	A-R
• Heart		A-D	A-J	A-R
CAD	A,D-H	A-D	A-J	A-R
Angina	A,D-H	A-D	A-J	A-R
Infarction	A,D-H	A-D	A-J	A-R
Cardiomyopathy	A,D-H	A-D	A-J	A-R
• Respiratory system	A,D-H	A-D	A-J	A-R
Pulmonary embolism	A,D-H	A-D	A-J	A-R
Bronchogenic Ca	A,C,D-H	A-D	A-J	A-R
• GIT:	A,D-H	A-D	A-J	A-R
Liver cirrhosis	A,D-H	A-D	A-J	A-R
Jaundice	A,D-H	A-D	A-J	A-R
Causes of hepatosplenomegaly	A,D-H	A-D	A-J	A-R
-Basics of internal medicine	B,D-H	A-D	A-J	A-R

5. Unit Methods of teaching/learning:

1. Didactic ; Lectures
2. Clinical rounds
3. Seminars
4. Clinical rotations
5. Service teaching
6. Post graduate teaching
7. Perform under supervision of senior staff
8. Case presentation
9. Written & oral communication
10. Observation

6. Unit Methods of teaching/learning: for students with poor achievements

1. Extra Didactic (lectures, seminars, tutorial) according to their needs
2. Extra Laboratory work according to their needs

7. Unit assessment methods:

Assessment tools:

1. Clinical examination
2. Written and oral examination
3. Chick list
4. log book & portfolio
5. Procedure/case presentation
6. Objective structured clinical examination
7. Check list evaluation of live or recorded performance
8. Patient survey
9. 360o global rating

ii.Time schedule: At the end of second part

iii. Marks: 100

8. List of references

i. Lectures notes

- Course notes
- Staff members print out of lectures and/or CD copies

ii. Essential books

Current Medical Diagnosis & treatment, 2022.

Harrisons - text book of Medicine ,20 edition

iii. Recommended books

- Davidson24 edition.

iv. Periodicals, Web sites, … etc

- **BMJ**

v. others: None

Course 5 Unit 2 General Surgery

1. Unit data

- **Unit Title: General Surgery**
- **Unit code: RAD228D#**
- **Specialty is Radio diagnosis**
- **Number of credit points: didactic 2 (28.6%), practical 5 (71 . 4 %), total 7.**
- Department (s) delivering the course: General Surgery
- Coordinator (s): Staff members of General Surgery Department in conjunction with Radio diagnosis Department as annually approved by both departments councils
- Date last reviewed: **4/2022**
- Requirements (prerequisites) if any : None

2. Unit aim

The student should acquire the basic Knowledge and surgical skills necessary for Radio diagnosis in clinical reasoning, diagnosis and management of diseases.

3. Unit intended learning outcomes (ILOs):

A- Knowledge and understanding

ILOs	**Methods of teaching/ learning**	***Methods of Evaluation***
A. Describe the etiology, clinical picture, diagnosis and management of the following diseases and clinical conditions: -Thyrotoxicosis • Multinodular Goiter • Solitary thyroid nodules • Benign and malignant thyroid tumors • Parathyroid glands tumors • Suprarenal tumors • Lymphadenopathy • Lymphomas • Breast cancer • Jaundice • Cholecystitis and gall stones • Testicular torsion • Neck masses. • Intestinal obstruction and GI tumors.	- Clinical round Seminars Lectures Case presentation Hand on workshops,	Written and oral examination Log book
B. Mention the principles of : -Basics of General Surgery		
C. State update and evidence based Knowledge of -Breast cancer - Lymphomas		

D. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to General Surgery.		
E. Mention the basic ethical and medicolegal principles revenant to the General Surgery.		
F. Mention the basics of quality assurance to ensure good clinical care in General Surgery.		
G. Mention the ethical and scientific principles of medical research		
H. State the impact of common health problems in the field of General Surgery on the society.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common diseases related to General Surgery.	-Clinical rounds -Senior staff experience	Procedure/case presentation Log book and Portfolios
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to General Surgery.		
C. Design and present cases , seminars in common problem.		
D-Formulate management plans and alternative decisions in different situations in the field of the General Surgery.		

C- Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Obtain proper history and examine patients in caring and respectful behaviors.	Clinical round Seminars Lectures Case presentation Hand on workshops Clinical rotation in the general surgery department	-OSCE -log book & portfolio -Clinical exam in general surgery
B. Order the following non invasive/invasive diagnostic procedures • Routine appropriate Lab investigations related to conditions mentioned in A.A . • Radio diagnosis studies, • FNA • True cut needle biopsy • Chest x rays	Clinical round with senior staff Observation Post graduate teaching Hand on workshops	- Procedure presentation - Log book - Chick list
C. Interpret the following non invasive/invasive diagnostic procedures • Routine appropriate Lab investigations related to conditions mentioned in A.A . • Radio diagnosis studies, • FNA • True cut needle biopsy • Chest x rays		
D. Perform the following non invasive/invasive therapeutic procedures	Operative -Direct	Written and oral

- Aspiration from abscess and collection.	observation -case presentation	examination -Log book -Procedure presentation
E. Prescribe the following non invasive/invasive therapeutic procedures : - Aspiration from abscess and collection	Clinical round with senior staff Perform under supervision of senior staff	- Procedure presentation - Log book - Chick list
F. Carry out patient management plans for common conditions related to General Surgery as mentioned in A.A	Clinical round with senior staff Perform under supervision of senior staff	- Procedure presentation - Log book - Chick list
G. Use information technology to support patient care decisions and patient education in common clinical situations related to Procedure presentation.		
H. Provide health care services aimed at preventing health problems related to Procedure presentation.		
K. Provide patient-focused care in common conditions related to General Surgery, while working with health care professionals, including those from other disciplines for the conditions mentioned above in A.A		

D- General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(audit, logbook)	-Case log -Observation and supervision -Written & oral communications	-Portfolios -Global rating Simulation
B. Appraises evidence from scientific studies(journal club)		
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain therapeutic and ethically sound relationship with patients.	Observation & supervision Didactic	Simulation Record review (report)
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case in common conditions mentioned above in A.A.		
K. Write a report in conditions mentioned in A.A.		
L. Council patients and families about the conditions mentioned above in A.A.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	-Case log Observation and supervision Written & oral communications	1.Objective structured clinical examination 2. Patient survey 3.360o global rating
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems.	Observation & supervision Didactic	1-Check list evaluation of live or recorded performance. 2. 360o global rating 3. Patient survey 4. portfolios
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		
R. Assist patients in dealing with system complexities.		

4. Unit contents (topic s/modules/rotation
Course Matrix

Time Schedule: first Part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skill	General Skills
Thyrotoxicosis	A,D-H	A-D	A-C,F-I	A-R
• Multinodular Goiter	A,D-H	A-D	A-C,F-I	A-R
• Solitary thyroid nodules	A,D-H	A-D	A-C,F-I	A-R
• Benign and malignant thyroid tumors	A,D-H	A-D	A-C,F-I	A-R
• Parathyroid glands tumors	A,D-H	A-D	A-C,F-I	
• Suprarenal tumors	A,D-H	A-D	A-C,F-I	A-R
• Lymphadenopathy	A,D-H	A-D	A-C,F-I	A-R
• Lymphomas	A,C,D-H	A-D	A-C,F-I	
• Breast cancer	A,C,D-H	A-D	A-C,F-I	A-R
• Jaundice	A,D-H	A-D	A-C,F-I	A-R
• Cholecystitis and gall stones	A,D-H	A-D	A-C,F-I	
• Testicular torsion	A,D-H	A-D	A-C,F-I	A-R
• Neck masses.	A,D-H	A-D	A-C ,D,E	A-R
• Intestinal obstruction and GI tumors.	A,D-H	A-D	A-C ,D,E	A-R
- Basics of general surgery	B,D-H	A-D	-	-

5. Unit Methods of teaching/learning:

1. Didactic ; Lectures
2. Clinical rounds
3. Seminars Clinical rotations
4. (service teaching) Observation
5. Post graduate teaching
6. Hand on workshops
7. Perform under supervision of senior staff
8. Simulations
9. Case presentation

6. Unit Methods of teaching/learning: for students with poor achievements

1. Extra Didactic (lectures, seminars, tutorial) according to their needs
2. Extra training according to their needs

7. Unit assessment methods:

i. Assessment tools:

1- Clinical examination
2- Written and oral examination
3- Chick list
4- log book & portfolio
5- Procedure/case presentation
6- Objective structured clinical examination
7- Check list evaluation of live or recorded performance
8- Patient survey
9- 360o global rating

ii.Time schedule: At the end of second part.

iii. Marks: 100

8. List of references

i. Lectures notes

- Course notes
- Staff members print out of lectures and/or CD copies

ii. Essential books

- **(General surgery textbooks)**

iii. Recommended books

- **Management of Thyroid Cancer and Related Nodular Disease**

iv. Periodicals, Web sites, … etc

- **Surgical Clinics of North America**

v. others: None

Course 5 Unit 3 (Pathology)

1. Unit data

- **Unit Title: Pathology**
- **Unit code: RAD228D#**
- **Speciality is Radio diagnosis**
- **Number of credit points :, didactic 2 (100%) practical 0 (0 %) Total 2.**
- **Department (s) delivering the course: Pathology in conjunction with Radio diagnosis**
- **Coordinator (s): Staff members of Pathology Department in conjunction with Radio diagnosis Department as annually approved by both departments councils**
- **Date last reviewed: 4/2022**
- **Requirements (prerequisites) if any : None**

2. Unit aim

The student should acquire the pathological facts necessary for Radio diagnosis

3. Intended learning outcomes (ILOs):

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Mention Principles of General Pathology of: -Tumors	-Lectures	-Written and oral examination - Log book
B-Describe Pathologic Details of: - ***Brain diseases*** Tumors Cerebral aneurysms - ***Bone diseases*** o Tumors o Pathological fractures - ***Renal diseases*** o Obstructive Uropathy - ***GIT*** o Peptic ulcer o Gall bladder diseases - ***Cardiology*** Ischemic heart disease		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of Pathology with clinical reasoning, diagnosis and management of common diseases related to Radio diagnosis.	Didactic (lectures, seminars, tutorial)	-Written and oral examination -Log book

C- Practical skills = 0

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform data management including data entry and analysis.	-Observation and supervision -Written and oral communication	Log book

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
B. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.	-Observation and supervision -Written and oral communication	Log book
C. Write a report in common condition mentioned in A.A and A.B		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
D. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	-Observation -Senior staff experience	Logbook

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
E. Work effectively in relevant health care delivery settings and systems.	-Observation -Senior staff experience	Logbook

4. UNIT contents (topic s/modules/rotation
Course Matrix

Time Schedule: first Part

Topic	Covered ILOs			
	Knowledge A	Intellectual B	Practical skill C	General Skills D
Principles of General Pathology of:				
- Tumors	A	A	-	A-E
Pathologic Details of:				
- ***Brain diseases***	B	A	-	A-E
Tumors	B	A	-	A-E
Cerebral aneurysms	B	A	-	
- *Bone diseases*				
Tumors	B	A	-	A-E
Pathological fractures	B	A	-	
Renal diseases				
Obstructive Uropathy	B	A	-	A-E
GIT				
Peptic ulcer	B	A	-	A-E
Gall bladder diseases	B		-	A-E
Cardiology				
Ischemic heart disease	B	A	-	A-E

5.Unit Methods of teaching/learning:

1 Didactic (lectures, seminars, tutorial)
2 Observation and supervision
3 Written & oral communication
4 Senior staff experience

6. Unit Methods of teaching/learning: for students with poor achievements

1. Extra Didactic (lectures, seminars, tutorial) according to their needs

7. Unit assessment methods:

i. Assessment tools:

1. Written and oral examination
2. Log book

ii. Time schedule: At the end of the Second part

iii. Marks: 100

8. List of references

i. Lectures notes

- Course notes
- Staff members print out of lectures and/or CD copies

ii. Essential books

- (Pathology text books)

iii. Recommended books

Essentials of Rubin's Pathology

iv. Periodicals, Web sites, … etc

- Imaging
- www.pubmed.com
- www.eanm.org

v. others: None

9. Signature

Course Coordinator	
Unit 1 Coordinator: ……	**Head of the Department:** ……
Date: 4/2022	**Date: 4/2022**
Unit 2 Coordinator: ……	**Head of the Department:** ……
Date: 4/2022	**Date: 4/2022**
Unit 3 Coordinator: ……	**Head of the Department:** ……

Second Part

Course 6 Radiological diagnosis

Name of department: Radio diagnosis
Faculty of medicine
Assiut University
2022 - 2023

1. Course data

- **Course title: Radiological diagnosis**
- **Course code: RAD 228 D**
- **Speciality is :Radio diagnosis**
- **Number of credit points: Didactic 24 credit point (20 %) practical 96 (80%), total (120)**
- **Department (s) delivering the Course: Department of Radio diagnosis- Faculty of Medicine- Assiut University**
- **Coordinator (s):**
  - **Principle coordinator: Prof. Gehan Sayed Seif**
    Dr Mohamed Abdel-Tawab
- **Date last reviewed: 4/2022**
- **Date of most recent approval of program specification by the Faculty of Medicine Council of Assiut University.**
- **Admission Requirements (prerequisites) if any : None**

This course consists of 6 Units (Modules)

1. Module or unit 1 Gastrointestinal tract.
2. Module or unit 2 Genito-urinary tract
3. Module or unit 3 Neuroradiology, head and neck.
4. Module or unit 4 Ultrasound
5. Module or unit 5 Musculoskeletal system.
6. Module or unit 6 Chest and cardiovascular system.

Unit Coordinator (s):

Unit	Principle Coordinator	Assistant coordinators
1- **Unit (Module) 1** Gastrointestinal tract.	Prof. Abd El Karim Hassan	Prof. Eman Abo El Hamd
2- **Unit (Module) 2** Genito-urinary tract	Prof. Hisham Moustafa	Prof. Hassan Ibrahim
3- Unit (Module) 3 Neuroradiology, head and neck	Prof. Ahmad Moustafa	Prof. Samy A. El Aziz
4- Unit (Module) 4 Ultrasound	Prof. Afaf Abd El Kader	Prof. Nagham Nabil Omar
5- Unit (Module) 5 Musculoskeletal system	Prof. Mostafa Thabet Hussein	Prof. Hosam El-Din Galal Mohamed
6- Unit (Module) 6 Chest and cardiovascular system.	Prof. Samy A. El Aziz	Prof. Hosameldeen Abozaid Yousef

2. Course Aims

1-To understand the indications for examinations and familiarity with the principles and limitation of studies, including benefit and risk to the patient.
2-Understand the technical principles of US, CT and MRI and develop skill in protocol-ling, monitoring and interpreting cross-sectional imaging examination.

3- Be familiar with the comprehensive knowledge about basic principles of ultrasound physics and the resident should understand the importance of clinical ultrasound protocols.
4- Gain a general understanding of both the clinical uses and limitations of ultrasound as well as the appropriate integration of other complementary cross sectional imaging studies particularly CT and MRI.
5- Recognize the role that ultrasound plays in the management of patient's illness and make proper recommendations when needed.
6-Recognize normal anatomy, pathological abnormalities (including obstruction, masses and inflammation), and adult normal variants of GU tract relevant to plain radiography, IVU, US and CT examination.
7-Demonstrate correct evaluation of primary and secondary tumors of the GU tract and adrenal glands.
8 -Demonstrate knowledge of principles of informed consent, including what information is needed and when and appropriate documentation of such.
9-Demonstrate awareness of medico legal aspects of reporting.
10-Discuss findings and provide appropriate differential diagnoses for degenerative disease, articular diseases, bone tumors, soft tissue lesions, sports related injury, and infective, inflammatory and rheumatological conditions.
11-Discuss indications for routine radiography, and CT in the workup of musculoskeletal pathology.

12-Demonstrates knowledge of normal chest anatomy and appropriate positions for tubes, catheters and other medical devices on chest image.
13-Demonstrates ability to diagnose common conditions and life threaten conditions (pneumo-thorax) on chest radiography.
14-Understands cardiac and aortic arch great vessels anatomy and the physiologic basis for common diseases (congestive heart failure, pulmonary hypertension, pericardial effusion and coarctation of the aorta).
15-Be able to monitor and interpret CTA for pulmonary embolism.
16-Demonstrate working knowledge of normal and abnormal anatomy relevant to GI imaging with fluoroscopy, plain radiography and CT. Be familiar with both common and uncommon GI conditions and be able to formulate extensive differential diagnosis.

17-Enhance CT skills including head and neck radiology.
18--Become familiar with MRI sequences including how to tailor and MRI study to answer the clinical question.
19-Assist in scheduling neuro-radiological procedures appropriate with assistance from staff as necessary.
20-Provide provisional interpretations and consultations of plain radiographs, CT scan and MR scans performed in the emergency cases.

3. Course intended learning outcomes (ILOs):

Unit (Module) 1 Gastrointestinal tract

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Describe accurately imaging findings in different diseases of the pharynx and esophagus: -Benign disease: -Functional swallow and motility disorders. -Pouch, webs and diverticula. -Inflammatory/ infectious disorders. -Tumors. -Trauma, foreign body and fistula. -Extrinsic compression. -Aberrant vessels. -Mediastinal mass. -Varices. -Malignant lesions. -Post operative evaluation. -Manifestation of systemic diseases. -Gastro-esophageal junction disorders.	Clinical rotation, didactic lectures and conferences. -case presentation	- Written and oral exam -Daily work. -Behavior with the technical personnel, senior resident and staff. -Clinical evaluation at end of rotation. -Log book
B. Mention different imaging findings in stomach lesions: -Peptic ulcer disease. -Gastritis. -Tumors. -Post operative stomach and duodenum. -Learns imaging findings in small bowel lesions: -Obstruction.		

-Infection. -Crohns. -Mal-absorption. -Vascular lesion and trauma. -Tumors. -Post operative and post radiation. - State different imaging findings in colon and appendix lesions: -Obstruction. -Infection: TB. -Non infectious colitis. -Inflammatory bowel disease. -Diverticulosis. -Appendicitis. -Tumors. -Post operative and post radiation.		
C. Know different hepatic lesions: -Focal liver disease. -Diffuse liver disease. -Trauma. -Infection. -Recognizes imaging findings in splenic lesion: -trauma. -Systemic disease. -Splenic masses.		
D. Illustrate a systematic approach to pancreatic lesion: -Pancreatitis. -Trauma. -Pancreatic tumors. -Calcification. -Gall bladder and biliary tree lesions.		
E. Know vascular lesions: -Abdominal aorta *Aneurysm.		

*Dissection. *Vasculitis. -Mesentric arteries and veins: -Vasculitis, atherosclerosis, emboli. - Recognize and defines peritoneal cavity as regard: -Distribution of fluid collection. -Diseases of the peritoneum: -Inflammatory. -Primary tumors. -Metastatic tumors. -Demonstrates retro-peritoneum as regard: -Normal anatomy: -Retroperitoneal spaces and planes. -Benign diseases. -Malignant tumors. - Define systemic diseases and GIT manifestation: -trauma. -Ischemia. -Crohns. -Connective tissue disorders. -Polyposes. -Radiation. -Metastasis.		
F. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to the Gastrointestinal disease.		

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common conditions related to Gasterointestinal tract system.	Clinical rounds Senior staff experience	Portfolios Procedure/case presentation Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Gasterointestinal tract system.		
C. . Design and /or present a case or review (through seminars/journal clubs.) in one or more of common clinical problems relevant to the field of Gasterointestinal tract system.		
D-Formulate management plans and alternative decisions in different situations in the field of the Gasterointestinal tract system.		

C-Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform different imaging techniques -CT examination: -US examination.	-Didactic clinical rotation. -Rotation in inpatient and outpatient clinics. -Direct observation. -Case presentation.	-Portfolios. -Procedure log book. -Oral exam. Written exam. -Global rating.
B. Use adequate knowledge in application of the protocols of the others different imaging modalities: -CT examination: -Procedure: preparation. -Oral contrast agent. -CT enema examination. -IV contrast agent. -Tri-phasic CT dynamic study. -CT-angiogram. -US examination.		
C. Perform non invasive and invasive therapeutic procedures and participate with senior staff in performance of percutaneous trans-hepatic cholangiography: -External biliary drainage. -Trans-tubal cholangiography.		
D. Carry out patient diagnostic plans for common gastrointestinal problems.		
E. Use information technology to support patient care		

decisions and patient education .		
F. Provide health care services aimed at preventing the following conditions: -The complications of percutaneous trans-hepatic cholangiography. -The complications of IV contrast agents.		
G. Work with health care professionals, including those from other disciplines, to provide patient-focused care for Gastrointestinal diseases .		

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(share in audit and risk management activities and use logbook).	Case log. -Observation and supervision. -Written and oral communication.	Portfolios. Global rating.
B. Appraises evidence from scientific studies(journal club)		
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis using information technology to manage information, access on-line medical information; and support their own education.		
E. Facilitate learning of junior students and other health care professionals including their evaluation and assessment.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain therapeutic and ethically sound relationship with patients.	Didactic. -Observation and supervision.	Report.
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case and Articles in Gasterintestinal tract system		
K. Write a report in: - Final report about findings and diagnosis of Gasterintestinal tract examination		
L. Council patients and families about the findings of Gasterintestinal tract examination.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Didactic Observation and supervision	Clinical assessment. -global rating.
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems including good administrative and time management.	Didactic. -Observation and supervision.	-Recorded performance. -portfolios. -global rating.
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		
R. Assist patients in dealing with system complexities.		

Unit (Module) 2 Genitourinary tract

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A .Mention the current and updated principles of following: -contrast administration and patho-physiology of diseases including: -Dynamic bolus enhancement on cross sectional imaging studies and IVU. -Arterial phase CT or MR used for tumor diagnosis. -Arterio-venous shunt diagnosis. -Parenchymal phase CT for inflammatory B. Describe the following diseases and conditions: manifestation of renal parenchyma including: -Acute pyelonephritis. -Renal and peri-renal abscess. -Xantho-granulomatous pyelonephritis. -TB. -Emphysematous pyelitis. -Tissue viability and revascularization in trauma.	- Didactic lectures Clinical rotation in the in-patient and outpatient X-ray units.	- Written and oral exam -Daily work. -Behavior with the technical personnel, senior resident and staff. -Clinical evaluation at end of rotation. -Log book
C .Illustrate a large variety of congenital anomalies of GU tract: -Fusion anomalies. -Partial and complete duplications of the collecting systems. -Renal agenesis. -Renal tubular ectasia. -Uterine anomalies. Understand the renal cystic diseases: -Multi-cystic renal diseases.		

-Simple renal cyst. -Complex renal cysts.		
D. Describe different types of renal, ureteric and urinary bladder and prostate neoplasm in different imaging modalities.		
E. List patterns of genitourinary differential diagnosis such as: -Renal masses. -Uni- or bilateral renal enlargements. -Filling defects. -Ureter deviation (both medial and lateral). -Bladder displacement.		
F. Give the interpretation and identification of the following with imaging: -Plain abdominal films for bowel gas pattern and recognition of masses and calcification. -Renal renal stone disease. -Contrast examination for Hydronephrosis and uretral obstruction. -Urothelial abnormalities. -Renal cysts and tumors. -Medullary sponge kidney. -BPH. -Urinary Bladder lesion. -Urethral stricture and diverticula. -HSG appearance of intra-vasation, uterine synechiae, filling defects, hydrosalpinx, congenital anomalies.		
G. Describe principals of imaging in GU trauma: -Bladder, ureteral and renal injuries. -Diagnosis, classification of GU trauma.		
H. Mention diagnosis of female pelvic disorders including: -Pelvic inflammatory disease. -Endometriosis. -Ovarian cysts and masses.		

-Uterine fibroids. -uterine tumors. -Female and male infertility.		
I. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to Genitourinary disorders.		

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common conditions related to **Genitourinary system**.	Clinical rounds Senior staff experience	Portfolios Procedure/case presentation Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Genitourinary system.		
C. Design and /or present a case or review (through seminars/journal clubs.) in one or more of common clinical problems relevant to the field of Genitourinary system.		
D. Formulate management plans and alternative decisions in different situations in the field of the Genitourinary system.		

C-Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Use and apply the protocols of CT examination: -Patient preparation. -Contrast injection. -CT urography. -CT angiography for renal arteries.	-Didactic clinical rotation. -Rotation in inpatient and outpatient clinics. -Direct observation. -Case presentation.	-Portfolios. -Procedure log book. -Oral exam. Written exam. -Global rating.
B. Elicit MR urography and MR-angiography and application of CT-and MR-angiogram of renal vasculitic conditions.		
C. Participates with senior staff in performance of interventional procedures: -Percutaneous biopsy. -Percutaneous abscess drainage.		
D. Use information technology to support patient care decisions and patient education in common clinical situations related to Genitourinary system.		
E. Provide health care services aimed at preventing health problems related to Genitourinary system .		
F. Provide patient-focused care in common conditions related to Genitourinary system, while working with health care professionals, including those from other disciplines .		

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(share in audit and risk management activities and use logbook).	Case log. -Observation and supervision. -Written and oral communication.	Portfolios. Global rating.
B. Appraises evidence from scientific studies(journal club)		
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis using information technology to manage information, access on-line medical information; and support their own education.		
E. Facilitate learning of junior students and other health care professionals including their evaluation and assessment.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain therapeutic and ethically sound relationship with patients.	Didactic. -Observation and supervision.	Global rating Procedure/case presentation -Log book and Portfolios -Chick list
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case and Articles in Genitourinary system.		
K. Write a report in: - Final report about findings and diagnosis of Genitourinary examination.		
L. Council patients and families about the findings of the US examination.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Didactic Observation and supervision	Clinical assessment. -global rating.
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems including good administrative and time management.	Didactic. -Observation and supervision.	-Recorded performance. -portfolios. -global rating.
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		
R. Assist patients in dealing with system complexities.		

Unit (Module) 3 Neuro-radiology, Head and neck

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Know the abnormal findings in congenital malformation of the brain: -Disorders of neural tube closure. -Disorders of cleavage, sulcation, diverticulation and cellular migration. -Recognizes posterior fossa malformation and cysts. -Recognizes neurocutaneous syndromes: -Neurofibromatosis. -Tuberous sclerosis. -Sturge Weber syndrome. -Von-Hippel Lindau disease. -Recognizes and describe common location and findings of inherited metabolic, white matter and degenerative disease.	Clinical rotation, didactic lectures and conferences. -case presentation	- Written and oral exam -Daily work. -Behavior with the technical personnel, senior resident and staff. -Clinical evaluation at end of rotation. -Log book
B. Mention systemic approach to tumors and tumor like conditions of the; -Brain -Sellar and para-sellar region. -Posterior fossa.		
C. Describe a systematic assessment and imaging findings of infection of: -Brain and its lining. -Congenital and neonatal infections. -Encephalitis. -TB and fungus infection.		

D.Illustrate imaging findings of congenital anomalies of the spine and spinal cord: -Open and occult spinal dysraphism. -Split notochord syndromes. -Miscellaneous. -Demonstrates a systematic assessment of cysts, tumors and tumors like lesion of the spine and spinal cord. -Demonstrate learning of non-neoplastic disorders of the spine and spinal cord: -Infection. -Demyelinating diseases. -Vascular lesion. -Degenerative diseases. -Disk bulges and prolapsed disk.		
E. Define and Recognize intra-cranial hemorrhage and imaging findings in: -CT. -MRI and factors influencing signal. -Non traumatic intracranial hemorrhage. -Cerebral aneurysms. -Recognizes the causes and describe the imaging findings in stroke. - Demonstrates imaging findings in cranio-cerebral trauma: -Classification. -Primary traumatic lesions. -Secondary effects of cranio-cerebral trauma. -Sequel of trauma.		
F. Describe and define the imaging findings in: -Para-nasal sinuses lesions (inflammatory lesions, tumors and trauma). -Orbital lesions and lacrimal apparatus. -Mandible: cysts and tumors. -Thyroid gland and laryngeal lesion. -Demonstrate a systematic approach to --CP-angle		

mass lesion and tinnitus. -Cholesteatoma. -Neck lesions: larynx, thyroid gland and DD. Of neck masses.		
G. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to Neuro-radiology, head and neck.		

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common conditions related to Neurological system.	Clinical rounds Senior staff experience	Portfolios Procedure/case presentation Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Neurological system.		
C. Design and /or present a case or review (through seminars/journal clubs.) in one or more of common clinical problems relevant to the field of Neurological system.		
D. Formulate management plans and alternative decisions in different situations in the field of the Neurological system.		

C-Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Apply protocols of CT and MRI examination as regard: -CT: -Imaging parameters including window and level settings, slice thickness, inter-slice gap, helical imaging parameters and image reconstruction algorithm. -Learns the typical CT density of commonly occurring processes: such as edema, air, calcium, blood and fat. MRI: -Identify commonly used pulse sequences. Learn the intensity of normal tissues on routine pulse sequences.	-Didactic clinical rotation. -Rotation in inpatient and outpatient clinics. -Direct observation. -Case presentation.	-Portfolios. -Procedure log book. -Oral exam. Written exam. -Global rating.
B. Carry out CT and MR angiogram and MR venogram in neuroradiology and participates with the senior staff in performance of cerebral angiography.		
C. Carry out patient diagnostic plans for common Neurological problems.		
D. Use information technology to support patient care decisions and patient education .		
E. Provide health care services aimed at preventing the following conditions: -The complications of cerebral Angiogram.		
F. Work with health care professionals, including those from other disciplines, to provide patient-focused care for neurological disorders.		

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(share in audit and risk management activities and use logbook).	Case log. -Observation and supervision. -Written and oral communication.	Portfolios. Global rating.
B. Appraises evidence from scientific studies(journal club)		
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis using information technology to manage information, access on-line medical information; and support their own education.		
E. Facilitate learning of junior students and other health care professionals including their evaluation and assessment.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain therapeutic and ethically sound relationship with patients.	Didactic. -Observation and supervision.	Report.
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case and Articles in Neuroradiology		
K. Write a report in: - Final report about findings and diagnosis of Neurological examination.		
L. Council patients and families about the findings of Neurological examination.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Didactic Observation and supervision	Clinical assessment. -global rating.
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems including good administrative and time management.	Didactic. Observation and supervision.	-Recorded performance. -portfolios. -global rating.
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		
R. Assist patients in dealing with system complexities.		

Unit (Module) 4 Ultrasound

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Define the principals of : -Ultra-sound: -Sound wave propagation. -Sound wave properties. -Power and intensity. -Interaction of sound waves with tissues, reflection, attenuation, scattering, refraction, absorption, acoustic impendence.	-Didactic lectures. -Case presentation.	-Daily work -Clinical evaluation at the end of rotation--Log book
B. Mention the principles of the: -Frequency. -Sound speed. -Wavelength and intensity. -Generation and detection		
C. Mention of -Transducer components. -Doppler phenomenon and -pulse echo-imaging.		
D. Define the principals of : -Normal basic cross sectional ultrasound anatomy.		
E. Examine Image processing and display. -Bio-effects and safety: -Thermal and non-thermal effect on tissues. -Relative effects of gray scale, M-mode, pulsed wave Doppler, color flow imaging, power imaging, and harmonics.		
F- Elicit imaging applications/ equipment operation: -Transducer choice.		

-Frequency. -Shape: linear, sector, curved. -Approach: external or endo-cavitary. -Image orientation. -Image recording options.		
G-Examine artifacts -underlying principles. -Beam width artifacts. -Refractive artifacts. -Doppler artifacts.		
H. Memorize the facts and principles of the relevant basic and clinically supportive sciences related to Ultrasound.		
I. Mention the basic ethical and medicolegal principles that should be applied in practice and are relevant to Ultrasound.		
J. Mention the basics and standards of quality assurance to ensure good clinical practice in the field of Ultrasound.		
K. Mention the ethical and scientific principles of medical research methodology.		
L. State the impact of common health problems in the field of Ultrasound on the society and how good clinical practice improve these problems.		

B- Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common conditions related to Ultrasound.	Clinical rounds Senior staff experience	Portfolios Procedure/case presentation Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Ultrasound.		
C. Design and /or present a case or review (through seminars/journal clubs.) in one or more of common clinical problems relevant to the field of Ultrasound.		
D. Formulate management plans and alternative decisions in different situations in the field of the Ultrasound.		

C- Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Obtain proper history and examine patients in caring and respectful behaviors.	-Didactic ultrasound clinical rotation. -Rotation in inpatient and outpatient clinics. -Direct observation. -Case presentation.	Daily work. -Log book. -Oral and clinical examinatio n.
B-Use adequate knowledge of: -Examination protocols for: -Basic cross sectional ultrasound for each of the anatomic areas: liver, spleen and kidneys. -Gall bladder and biliary system. -Pancreas. -Adrenal glands. -Urinary bladder. -uterus. -prostate. -Abdominal aorta. -Retro-peritoneal structures.		
C-Elicit the acoustic properties of: -Tissue characteristics. -Calcification. -Cyst. -Fluid. -Complex fluid and solid structures. -Acoustic shadowing and enhancement.		
D. Perform the following non invasive/invasive therapeutic procedures -Perform trans-abdominal ultrasound of the: -Abdominal viscera. -Adrenal glands: focal lesion. -Peritoneal cavity: fluid collection.		

-GIT: appendicitis, mass, pyeloric stenosis and intussusceptions. -Retro-peritoneum: mass and adenopathy.		
E-Performs pelvic examination: -Urinary bladder. -Uterus: normal size, shape, endometrial thickness, hyperplasia, polyps, leiomyoma, adenomyosis, tumors. -Cervix: mass, stenosis, tumors. -Ovary: normal size and shape. Physiological variation. Infection, tumors -Prostate: Normal sizes, shape, cystic or solid mass, abscess. -Scrotum: normal size and shape of testis. Infection, tumors, torsion, trauma, sepermatocele, calcification, varicocele and hydrocele.		
F. Performs specific application for US. Neck: -Thyroid gland. -Cystic neck masses and adenopathy. Chest: -Pleural fluid. Breast: -Cystic versus solid, masses and abscess.		
G-Use obstetrics US: -Early pregnancy. -Demonstrate abnormal findings with early pregnancy. -Performs complete examination of the 2nd and 3rd trimester. -Demonstrates: -Fetal abnormalities. -Non fetal abnormalities. -Performs emergency US for: -ectopic pregnancy and other urgent conditions.	-Didactic -ultrasound clinical rotation in obstetric and gynecological department -Overnight shift with senior staff	Log book.
H-Elicit Techniques for ultrasound guided aspiration of fluid collection and biopsy including: -Informed consent. -Sterile technique. -Pre-procedural evaluation of coagulation laboratory studies and anticoagulation medication. -Procedure and post procedure care.	Participates with the senior staff and perform the procedure.	Log book
I. Carry out patient management plans for common conditions		

related to Ultrasound.		
J. Use information technology to support patient care decisions and patient education in common clinical situations related to Ultrasound.		
K-Provide health care services aimed at preventing health problems related to Ultrasound.		
L-Provide patient-focused care in common conditions related to Ultrasound, while working with health care professionals, including those from other disciplines .		
M- Write competently all forms of patient charts and sheets including reports evaluating these charts and sheets (Write a consultation note, Inform patients of a diagnosis and therapeutic plan, completing and maintaining medical records).		

D- General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(share in audit and risk management activities and use logbook).	Case log. -Observation and supervision. -Written and oral communication.	Portfolios. Global rating.
B. Appraises evidence from scientific studies (journal club)		
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis using information technology to manage information, access on-line medical information; and support their own education.		
E. Facilitate learning of junior students and other health care professionals including their evaluation and assessment.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain therapeutic and ethically sound relationship with patients.	Didactic. -Observation and supervision.	Report.
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case and Articles in US.		
K. Write a report in: - Final report about findings and diagnosis of US examination.		
L. Council patients and families about the findings of the US examination.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Didactic Observation and supervision	Clinical assessment. -global rating.
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems including good administrative and time management.	Didactic. -Observation and supervision.	-Recorded performance. -portfolios. -global rating.
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		
R. Assist patients in dealing with system complexities.		

Unit (Module) 5 Musculoskeletal system

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Mention systematic approach to relatively common dysplasia and congenital conditions: -Achondroplasia. -Osteogenesis imperfecta. -Osteopetrosis. -Paget's disease. -Fibrous dysplasia.	- Didactic lectures Clinical rotation in the in-patient and outpatient X-ray units.	- Written and oral exam -Daily work. -Behavior with the technical personnel, senior resident and staff. -Clinical evaluation at end of rotation. -Log book
B. Define the current and updated principles of following: -A systemic assessment of Benign and malignant bone tumors. -Classification of bone tumors. -Radiographic findings of benign and malignant features of bone tumor. -Cartilaginous origin. -Osseous origin. -Fibrous origin. -Myelogenous origin.		

-Cyst. -Metastasis.		
C. Illustrate knowledge of a systematic approach to articular disease: -Classification and Radiographic findings of articular disease.. -Infection. -Inflammatory/immune. -Degenerative. -Neuropathic. -Metabolic and endocrine. -synovial tumor. -Fracture. -Chondral disease.		
D. Mention soft tissue lesions: -Classification of soft tissue lesion. -Radiographic findings of soft tissue lesion.		
E. Mention radiological findings and classification of infectious lesions:		
F.Mention radiological findings of hematopoietic and storage disease: -Sickle cell anemia. -Thalassemia. -Mastocytosis. -Gaucher's disease. -Reticulo-endothelioses. -Recognize and describe common location of and radiological manifestations of osteonecrosis.		
G. Illustrate a systematic assessment of a solitary lesion of bone and be able to categorize the lesion. Develop an appropriate differential diagnosis.		
H. Memorize the facts and principles of the relevant basic and clinically supportive sciences appropriate to the conditions mentioned in B, C, F		

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common conditions related to Muscloskeletal system.	Clinical rounds Senior staff experience	Portfolios Procedure/case presentation Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Muscloskeletal system.		
C. Design and /or present a case or review (through seminars/journal clubs.) in one or more of common clinical problems relevant to the field of Muscloskeletal system.		
D-Formulate management plans and alternative decisions in different situations in the field of the Muscloskeletal system.		

C-Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Use and apply the protocols of CT examination in MSK system: -Axial cuts. -Bone and soft tissue window setting. -IV contrast	-Didactic clinical rotation. -Rotation in inpatient and outpatient clinics. -Direct observation. -Case presentation.	-Portfolios. -Procedure log book. -Oral exam. Written exam. -Global rating.
B. Elicit knowledge of MRI safety issues including: -contraindication to scanning and use of contrast. -Demonstrate learning of the use of various pulse sequences and planes of imaging used in MSK disorders.		
C. Perform non invasive and invasive diagnostic procedures and Participates with the senior staff in performance of interventional procedures: -Percutaneous biopsy: -Evaluation of the patients. -Knowledge of appropriate indication and contra-indication. -Complication. -Appropriate approach for biopsy.		
D. Use and apply different imaging modalities for soft tissue as: -Plain X-ray. -CT. -MRI. -US.		
E. Elicit Classification and Radiographic findings of common endocrine disease including:		

*Osteoporosis. *Osteomalacia. *Hyper-parathyroidism. -Endocrine disorders originating from: *Thyroid. *Parathyroid. *Adrenals. *Gonads. *Diabetes. -Radiographic findings of -Hypo and hyper-vitaminosis (vitamin A and D).		
F. Elicit common fractures and dislocation of the axial and peripheral skeleton: -Classification of fracture type. -Radiographic findings of a fracture. -Physiopathology and radiographic correlation of fracture healing.		

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(share in audit and risk management activities and use logbook).	Case log. -Observation and supervision. -Written and oral communication.	Portfolios. Global rating.
B. Appraises evidence from scientific studies(journal club)		
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis.		
E. Facilitate learning of junior students and other health care professionals.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain therapeutic and ethically sound relationship with patients.	Didactic. Observation and supervision.	Report.
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case and Articles in Muscloskeletal system.		
K. Write a report in: - Final report about findings and diagnosis of MSK examination.		
L. Council patients and families about the findings of the MSK examination.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Didactic Observation and supervision	Clinical assessment. -global rating.
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems including good administrative and time management.	Didactic. -Observation and supervision.	-Recorded performance. -portfolios. -global rating.
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		
R. Assist patients in dealing with system complexities.		

Unit (Module) 6 Chest and Cardiovascular system

A- Knowledge and understanding

ILOs	Methods of teaching/ learning	*Methods of Evaluation*
A. Know different signs in chest radiology:- -Air bronchogram. -Atelectasis. -Air crescent sign. -Silhouette sign. -Other signs. . Recognize a unilateral hyper lucent lung:- -on chest radiograph or CT. -Causes. -Appropriate differential diagnosis	Clinical rotation, didactic lectures and conferences. -case presentation	- Written and oral exam -Daily work. -Behavior with the technical personnel, senior resident and staff. -Clinical evaluation at end of rotation. -Log book
B. Knows and recognize Pulmonary vasculature as regard: -Pulmonary embolism. -Causes of pulmonary hypertension. -Examination of the lower limb veins as source of embolus.		
C. Describe and state the mediastinal masses and mediastinal and hilar lymph node enlargement as regard: -Causes of mediastinal masses and localization of the mass. -Causes of lymph node enlargement.		

-Recognize Cystic mediastinal masses. -State solitary and multiple pulmonary nodules as regard: -Definition of solitary pulmonary nodule and a pulmonary mass. -Causes of solitary nodule. -Causes of cavitary pulmonary nodule. -Demonstrate benign and malignant neoplasm of the lung: -Types of bronchogenic carcinoma. -TNM classification for staging. -causes of extra-thoracic metastases. -State the role of imaging of tumor. -Define primary pulmonary lymphoma.		
D. Illustrate the following on Interstitial lung disease ILD): -patterns of ILD on chest radiograph and CT. -Make specific diagnosis of ILD when supportive findings are present. -Changes of congestive heart failure on chest X-ray. -Terms of asbestosis related pleural disease. -Honeycombing of chest radiograph and CT (HRCT). -Radiographic classification of sarcoidosis. -Causes of unilateral ILD. knows categories, recognize pattern of alveolar lung disease (ALD): -Acute ALD. -Chronic ALD. -Causes of adult respiratory distress syndrome. -Predisposing factors. -Pattern of ALD on radiography and CT chest. -Recognize atelectasis, airways and obstructive lung disease: -partial or complete collapse. -Distinguish lung collapse from massive pleural effusion. -Types and causes of bronchiectasis.		

-Appearance of cystic fibrosis. -Pulmonary emphysema. -Recognize congenital lung disease: -Differences between intra-lobar and extra-lobar sequestration		
E. Mention radiographic manifestation of pulmonary infection including: -pulmonary TB. -Pulmonary aspergillus disease. -Intracavitary fungus ball. -Immune compromised patient. -Pneumonia. - **Viral pneumonia and CT apperance of COVID-19 pnemonia** **-radiographic and CT pattern of GGO** -Radiographic and CT appearance of miliary pattern and DD.		
F. Mention the findings that indicate each of the following on chest radiograph for cardiac valve diseases: -enlarged right atrium. -enlarged left atrium. -enlarged RT. ventricle. -enlarged left ventricle. -recognize Ischemic heart diseases as regard: -Complication of acute myocardial infarction. -Identify left heart failure on chest radiograph. -Define and state the myocardial disease: -types of cardio-myopathy. -Cardiac tumors. -Recognize pericardial disease: -Pericardial calcification. -Pericardial cyst. -Pericardial effusion. -Constrictive pericarditis.		

-Pericardial metastases. -Demonstrates congenital heart diseases.		
G. Identify the direct and indirect signs of trauma to the chest.		
H. Know lesions of the chest wall, pleura and diaphragm: -Causes of pleural effusion. -Recognize pneumo-thorax. -Pleural calcification. -Recognize pleural based mass. -Recognize unilateral elevation of the diaphragm. -Recognize diffuse pleural thickening. -Recognize the radiographic and CT findings of malignant mesothelioma.		
I. Illustrate the main concepts of basic and clinically supportive sciences which are appropriate to the Pathology of: -Lung abscess. -Cysts and cavities of the lung. General medicine: -Rheumatic and congenital heart diseases. -Ischemic heart disease. -Pulmonary embolism. -Pericardial effusion. -Pneumonias. -Pneumothorax. -TB. -Bronchial carcinoma. -Suppurative lung disease. -Surgical correlation in chest trauma.		

B-Intellectual outcomes

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Correlates the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common conditions related to Chest and Cardiovascular system.	Clinical rounds Senior staff experience	Portfolios Procedure/case presentation Log book
B. Demonstrate an investigatory and analytic thinking (problem solving) approaches to common clinical situations related to Chest and Cardiovascular system.		
C. Design and /or present a case or review (through seminars/journal clubs.) in one or more of common clinical problems relevant to the field of Chest and Cardiovascular system.		
D-Formulate management plans and alternative decisions in different situations in the field of the Chest and Cardiovascular system.		

C-Practical skills (Patient Care)

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform the protocols of CT chest examination: -Thin section. -High resolution. -Expiratory images. -Prone images. -Use of IV contrast. -Multi-detector CT. -CT angiography.	-Didactic clinical rotation. -Rotation in inpatient and outpatient clinics. -Direct observation. -Case presentation.	-Portfolios. -Procedure log book. -Oral exam. Written exam. -Global rating.

B. Perform the following non invasive and invasive diagnostic procedures and Participate with the senior staff in performance of CT guided needle biopsy as regard: -Indication. -Contra-indication. -Procedure. -Preparation. -Complication.		
C. Perform non invasive and invasive therapeutic procedures and Participate with the staff in the performance of angiography: -Indication and contra-indication. -Different angiographic procedures. -complication. -Post procedural care.		
D. Participate with senior staff in arteriography.		
E. Elicit role of ventilation and perfusion isotope scanning in cases of pulmonary embolism.		
E. Perform and carry out patient diagnostic plans for common chest and CVS system problems.		
F. Use information technology to support patient care decisions and patient education for the above mentioned conditions in B, C, D ,E		
G. Provide health care services aimed at preventing: -Complication of contrast agent and angiography		
H. Work with health care professionals, including those from other disciplines, to provide patient-focused care for the mentioned conditions in B, C, D, E		

D-General Skills

Practice-Based Learning and Improvement

ILOs	Methods of teaching/ learning	Methods of Evaluation
A. Perform practice-based improvement activities using a systematic methodology(share in audit and risk management activities and use logbook).	Case log. -Observation and supervision. -Written and oral communication.	Portfolios. Global rating.
B. Appraises evidence from scientific studies(journal club)		
C. Conduct epidemiological Studies and surveys.		
D. Perform data management including data entry and analysis using information technology to manage information, access on-line medical information; and support their own education.		
E. Facilitate learning of junior students and other health care professionals including their evaluation and assessment.		

Interpersonal and Communication Skills

ILOs	Methods of teaching/ learning	Methods of Evaluation
F. Maintain therapeutic and ethically sound relationship with patients.	Didactic. -Observation and supervision.	Report.
G. Elicit information using effective nonverbal, explanatory, questioning, and writing skills.		
H. Provide information using effective nonverbal, explanatory, questioning, and writing skills.		
I. Work effectively with others as a member of a health care team or other professional group.		
J. Present a case and Articles in chest and cardiovascular system.		
K. Write a report in: - Final report about findings and diagnosis of chest and cardiovascular examination.		
L. Council patients and families about the findings of the chest and cardiovascular examination.		

Professionalism

ILOs	Methods of teaching/ learning	Methods of Evaluation
M. Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society	Didactic Observation and supervision	Clinical assessment. -global rating.
N. Demonstrate a commitment to ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices		
O. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities		

Systems-Based Practice

ILOs	Methods of teaching/ learning	Methods of Evaluation
P. Work effectively in relevant health care delivery settings and systems including good administrative and time management.	Didactic. -Observation and supervision.	-Recorded performance. -portfolios. -global rating.
Q. Practice cost-effective health care and resource allocation that does not compromise quality of care.		
R. Assist patients in dealing with system complexities.		

4. Course contents (topic s/modules/rotation
Course Matrix

Time Schedule: Second part

Topic	Covered ILOs			
	Knowledge	Intellectual	Practical skill	General Skills
Unit 1 GASTEROINTESTINAL TRACT				
Imaging findings in different diseases of the pharynx and esophagus	***A***	***A-D***	**A-E ,G**	**A-R**
Different imaging findings in stomach lesions	***B***	***A-D***	**A-E,G**	**A-R**
Different hepatic lesions	***C***	***A-D***	**A-G**	**A-R**
systematic approach to pancreatic lesion	***D***	***A-D***	**A-E,G**	**A-R**
Vascular lesions	***E***	***A-D***	**A-E,G**	**A-R**
Supportive sciences related to the Gastrointestinal disease.	***F***	***A-D***	**A-G**	**A-R**
Unit 2 GENITOURINARY SYSTEM				
Current and updated principles and patho-physiology of genitourinary diseases	**A,B**	**A-D**	**A-F**	**A-R**
Congenital anomalies of GU tract.	**C**	**A-D**	**A-F**	**A-R**
Different types of renal, ureteric and urinary bladder and prostate neoplasm in different imaging modalities	**D,E**	**A-D**	**A-F**	**A-R**
Interpretation and identification of the	**F**	**A-D**	**A-F**	**A-R**

genitourinary diseases with imaging				
principals of imaging in GU trauma	**G**	**A-D**	**A-F**	**A-R**
Current and updated principles and patho-physiology of genitourinary diseases	**A,B**	**A-D**	**A-F**	**A-R**
Congenital anomalies of GU tract.	**C**	**A-D**	**A-F**	**A-R**
Different types of renal, ureteric and urinary bladder and prostate neoplasm in different imaging modalities	**D,E**	**A-D**	**A-F**	**A-R**
Interpretation and identification of the genitourinary diseases with imaging	**F**	**A-D**	**A-F**	**A-R**
principals of imaging in GU trauma	**G**	**A-D**	**A-F**	**A-R**
Male and female pelvic disorders	**H**	**A-D**	**A-F**	**A-R**
Basic and clinically supportive sciences related to Genitourinary disorders	**I**	**A-D**	**A-D**	**A-R**
Unit 3 NBEURORADIOLOGY,HEAD AND NECK				
Abnormal findings in congenital malformation of the brain	***A***	***A-D***	**A-F**	**A-R**
Systemic approach to tumors and tumor like conditions of the Brain	***B***	***A-D***	**A-F**	**A-R**
Systematic assessment and imaging findings of infection of Brain and its lining.	***C***	***A-D***	**A-F**	**A-R**

Imaging findings of congenital anomalies of the spine and spinal cord	***D***	***A-D***	**A-F**	**A-R**
Intra-cranial hemorrhage and its imaging findings	***E***	***A-D***	**A-F**	**A-R**
Imaging findings in: -Para-nasal sinuses lesions (inflammatory lesions, tumors and trauma). -Orbital lesions and lacrimal apparatus. -Mandible: cysts and tumors. -Thyroid gland and laryngeal lesion. -Cholesteatoma.	***F***	***A-D***	**A-F**	**A-R**
Principles of the relevant basic and clinically supportive sciences related to Neuro-radiology, head and neck.	***G***	***A-D***	**A-F**	**A-R**
Unit 4 ULTRASOUND				
Principals of Ultra-sound	**A**	**A-D**	**A-H,M**	**A-R**
Doppler phenomenon and pulse echo-imaging.	**C**	**A-D**	**A-H,M**	**A-R**
Normal basic cross sectional ultrasound anatomy.	**D**	**A-D**	**A-H,M**	**A-R**
Image processing and display	**E**	**A-D**	**A-M**	**A-R**
Imaging applications/ equipment operation	**F**	**A-D**	**A-H**	**A-R**
Ultrasound artifacts	**G**	**A-D**	**A-H**	**A-R**
sciences related to Ultrasound	**H**	**A-D**	**A-M**	**A-R**
Ethical and medicolegal principles relevant to Ultrasound.	**I**	**A-D**	**I-M**	**A-R**
Basics and quality of good	**J**	**A-D**	**A-M**	**A-R**

clinical practice in the field of Ultrasound				
Common health problems in the field of Ultrasound on the society	**L**	**A-D**	**I-L**	**A-R**
Unit 5 MUSCLOSKELETAL SYSTEM				
Systematic approach to common dysplasia and congenital conditions	**A**	**A-D**	**A-F**	**A-R**
Current and updated principles of bony lesions	**B**	**A-D**	**A-F**	**A-R**
Systematic approach to articular disease	**C**	**A-D**	**A-F**	**A-R**
Soft tissue lesions	***D***	**A-D**	**A-F**	**A-R**
Radiological findings and classification of infectious lesions	***E***	**A-D**	**A-F**	**A-R**
Radiological findings of hematopoietic and storage disease	***F***	**A-D**	**A-F**	**A-R**
Systematic assessment of a solitary lesion of bone	***G***	**A-D**	**A-E**	**A-R**
Unit 6 CHEST AND CARDIOVASCULAR SYSTEM				
Different signs in chest radiology	***A***	***A-D***	**A-C, F-I**	**A-R**
Pulmonary vasculature	***B***	***A-D***	**A-I**	**A-R**
Mediastinal masses	***C***	***A-D***	**A-C,F-I**	**A-R**
Interstitial lung disease	***D***	***A-D***	**A-C,F-I**	**A-R**
Radiographic manifestation of pulmonary infection	***E***	***A-D***	**A-C,F-I**	**A-R**
Viral pneumonia and CT appearance of COVID-19 pnemonia -radiographic and CT pattern of GGO	***E***	***A-D***	**A-C,F-I**	**A-R**

Chest radiograph for cardiac valve diseases	***F***	***A-D***	**A-C,F-I**	**A-R**
Direct and indirect signs of trauma to the chest	***G***	***A-D***	**A-C,F-I**	**A-R**
Lesions of the chest wall, pleura and diaphragm	***H***	***A-D***	**A-C,F-I**	**A-R**
The main concepts of basic and clinically supportive sciences of chest diseases	***I***	***A-D***	**A-C,F-I**	**A-R**

5. Course Methods of teaching/learning:

1. Lectures
2. Training
3. Clinical rotations
4. (service teaching) Observation
5. Post graduate teaching
6. Perform under supervision of senior staff
7. Simulations
8. Senior staff experience

6. Course Methods of teaching/learning: for students with poor achievements

1. Extra Didactic (lectures, seminars, tutorial) according to their needs
2. Extra training according to their needs

7. Course assessment methods:

i. Assessment tools:

1. Written and oral examination
2. Log book
3. Objective structure clinical examination (OSCE)
4. Portfolios
5. Simulation
6. Record review (report)
7. 360o global rating

ii. Time schedule: At the end of second part.

iii. Marks:1200

8. List of references

i. Lectures notes

- Staff members print out of lectures and/or CD copies

ii. Recommended books

1. Graniger and Allison: Diagnostic radiology: A textbook of medical imaging, 7th edition: 2020
2. David Sutton: Textbook of radiology and imaging, 7th edition: 2014
3. Bontrager MA, Kenneth L., Lampignano M: Bontrager's Handbook of Radiographic Positioning and Techniques, 8th Edition, 2013

iii. Periodicals, Web sites, … etc

- American journal of radiology.
- European journal of radiology.
- Radiology journal.
- Radiologic clinics of North America
- Egyptian Journal of radiology

9. Signature

Course Coordinator: Prof. **Gehan Sayed Ahmed**	Head of the Department: Prof: Mostafa Hashem
Date: **4/2022**	Date: **4/2022**

ANNEX 2
Program Academic Reference Standards (ARS)

1- Graduate attributes for master degree in Radio diagnosis

***The Graduate (after residence training and master degree years of study) must*:**

1- Have the capability to be a scholar, understanding and applying basics, methods and tools of scientific research and clinical audit ***in radio diagnosis***.

2- Appraise and utilise scientific knowledge to continuously update and improve clinical practice in related speciality.

3- Acquire sufficient medical knowledge in the basic biomedical, clinical, behavioural and clinical sciences, medical ethics and medical jurisprudence and apply such knowledge in patient care in the field of ***in radio diagnosis***.

4- Provide patient care that is appropriate, effective and compassionate for dealing with common health problems and health promotion using evidence-based and updated information.

5- Identify and share to solve health problems in his speciality.

6- Acquire all competencies –including the use of recent technologies- that enable him to provide safe, scientific, and ethical and evidence based clinical care including update use of new technology ***in radio diagnosis***.

7- Demonstrate interpersonal and communication skills that ensure effective information exchange with individual patients and their families and teamwork with other health professions, the scientific community and the public.

8- Function as supervisor, and trainer in relation to colleagues, medical students and other health professions.

9- Acquire decision making capabilities in different situations related to ***in radio diagnosis***.

10- Show responsiveness to the larger context of the health care system, including e.g. the organisation of health care, partnership with health care providers and managers, practice of cost-effective health care, health economics, and resource allocations.

11- Be aware of public health and health policy issues and share in system-based improvement of health care.

12- Show appropriate attitudes and professionalism.

13- Demonstrate skills of lifelong learning and maintenance of competence and ability for continuous medical education and learning in subsequent stages in ***in radio diagnosis***.

or one of its subspecialties.

2- Competency based Standards for clinical master degree graduates

2.1- Knowledge and understanding

By the end of the program, the graduate should demonstrate satisfactory knowledge and understanding of

2-1-A- Established basic, biomedical, clinical, epidemiological and behavioral sciences related conditions, problem and topics.

2-1-B- The relation between good clinical care of common health problems in the speciality and the welfare of society.

2-1-C- Up to date and recent developments in common problems related to ***radio diagnosis***.

2-1-D- Ethical and medicolegal principles relevant to practice in ***radio diagnosis***.

2-1-E -Quality assurance principles related to the good medical practice in ***radio diagnosis***.

2-1-F- Ethical and scientific basics of medical research.

2.2- Intellectual skills:

By the end of the program, the graduate should be able to demonstrate the following:

2-2-A- Correlation of different relevant sciences in the problem solving and management of common diseases of *radio diagnosis*.

2-2-B- Problem solving skills based on data analysis and evaluation (even in the absence of some) for common clinical situations related to *radio diagnosis*.

2.2- C- Demonstrating systematic approach in studying clinical problems relevant to *radio diagnosis*.

2-2-D- Making alternative decisions in different situations in ***radio diagnosis***.

2.3- Clinical skills

By the end of the program, the graduate should be able to

2-3-A - Provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

2-3-B- Demonstrate patient care skills relevant to *radio diagnosis*.

for patients with common diseases and problems.

2-3- C- Write and evaluate reports for situations related to the field of ***radio diagnosis***.

2.4- General skills

By the end of the program, the graduate should be able to

- ***Competency-based outcomes for Practice-based Learning and Improvement***

2-4-A- Demonstrate practice-based learning and improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence,, improvements in patient care and risk management.

2-4-B- Use all information sources and technology to improve his practice.

2-4-C- Demonstrate skills of teaching and evaluating others.

- ***Competency-based objectives for Interpersonal and Communication Skills***

2-4-D- Demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals.

- ***Competency-based objectives for Professionalism***

2-4-E- Demonstrate professionalism behaviors, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

- ***Competency-based objectives for Systems-based Practice***

2-4-F- Demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively use system resources to provide care that is of optimal value.

2-4-g- Demonstrate skills of effective time management.

2-4-H- Demonstrate skills of self and continuous learning.

Annex 3, Methods of teaching/learning

Annex 3, Methods of teaching/learning

	Patient care	**Medical knowledge**	**Practice-based learning/ Improvement**	**Interpersonal and communication skills**	**Professionalism**	**Systems-based practice**
Didactic (lectures, seminars, tutorial)	X	X		X	X	X
journal club,	X	X	X			
Educational prescription	X	X	X	X	X	X
Present a case (true or simulated) in a grand round	X	X	X	X	X	
Observation and supervision	X		X	X	X	X
conferences		X	X	X		X
Written assignments	X	X	X	X	X	X
Oral assignments	X	X	X	X	X	X

Teaching methods for knowledge

- ❖ Didactic (lectures, seminars, tutorial)
- ❖ journal club
- ❖ Critically appraised topic
- ❖ Educational prescription (a structured technique for following up on clinical questions that arise during rounds and other venues).
- ❖ Present a case (true or simulated) in a grand round
- ❖ Others

Teaching methods for patient care

- ❖ Observation and supervision /Completed tasks procedure/case logs
- ❖ On-the-job" training without structured teaching is not sufficient for this skill (checklists).
- ❖ Simulation is increasingly used as an effective method for skill/ teamwork training.

Teaching methods for other skills

- ❖ Written communication (e.g., orders, progress note, transfer note, discharge summary, operative reports, and diagnostic reports).
- ❖ Oral communication (e.g., presentations, transfer of care, interactions with patients, families, colleagues, members of the health care team) and/or non verbal skills (e.g., listening, team skills)
- ❖ Professionalism, including medical ethics, may be included as a theme throughout the program curriculum that includes both didactic and experiential components (e.g., may be integrated into already existing small group discussions of vignettes or case studies and role plays, computer-based modules) and may be modeled by the faculty in clinical practice and discussed with the resident as issues arise during their clinical practice.

Annex 4, Assessment methods

Annex 4, ILOs evaluation methods for Master Degree students.

Method	Practical skills	K	Intellectual	General skills			
	Patient care	K	I	Practice-based learning/ Improvement	Interpersonal and communication skills	Professionalism	Systems-based practice
Record review	X	X	X		X	X	X
Checklist	X				X		
Global rating	X	X	X	X	X	X	X
Simulations	X	X	X	X	X	X	
Portfolios	X	X	X	X	X		
Standardized oral examination	X	X	X	X	X		X
Written examination	X	X	X	X			X
Procedure/ case log	X	X					
OSCE	X	X	X	X	X	X	X

Annex 4, Glossary of Master Degree doctors assessment methods

- Record Review – Abstraction of information from patient records, such as medications or tests ordered and comparison of findings against accepted patient care standards.
- Chart Stimulated Recall – Uses the MSc doctor's patient records in an oral examination to assess clinical decision-making.
- Mini clinical evaluation: Evaluation of Live/Recorded Performance (single event) – A single resident interaction with a patient is evaluated using a checklist. The encounter may be videotaped for later evaluation.
- Standardized Patients (SP) – Simulated patients are trained to respond in a manner similar to real patients. The standardized patient can be trained to rate MSc doctor's performance on checklists and provide feedback for history taking, physical examination, and communication skills. Physicians may also rate the MSc doctor's performance.
- Objective Structured Clinical Examination (OSCE) – A series of stations with standardized tasks for the MSc doctors to perform. Standardized patients and other assessment methods often are combined in an OSCE. An observer or the standardized patient may evaluate the MSc doctors.
- Procedure or Case Logs – MSc doctors prepare summaries of clinical experiences including clinical data. Logs are useful to document educational experiences and deficiencies.
- PSQs – Patients fill out Patient Survey questionnaires (PSQs) evaluating the quality of care provided by a MSc doctors.

- Case /problems – assess use of knowledge in diagnosing or treating patients or evaluate procedural skills.
- Models: are simulations using mannequins or various anatomic structures to assess procedural skills and interpret clinical findings. Both are useful to assess practice performance and provide constructive feedback.
- 360 Global Rating Evaluations – MSc doctors, faculty, nurses, clerks, and other clinical staff evaluate MSc doctors from different perspectives using similar rating forms.
- Portfolios – A portfolio is a set of project reports that are prepared by the MSc doctors to document projects completed during the MSc study years. For each type of project standards of performance are set. Example projects are summarizing the research literature for selecting a treatment option, implementing a quality improvement program, revising a medical student clerkship elective, and creating a computer program to track patient care and outcomes.
- Examination MCQ – A standardized examination using multiple-choice questions (MCQ). The in-training examination and written board examinations are examples.
- Examination Oral – Uses structured realistic cases and patient case protocols in an oral examination to assess clinical decision-making.
- Procedure or Case Logs – MSc doctors prepare summaries of clinical experiences including clinical data. Logs are useful to document educational experiences and deficiencies.
- PSQs – Patients fill out Patient Survey questionnaires (PSQs) evaluating the quality of care provided by MSc doctors.

Annex 5,
Program evaluation tools

By whom	Method	sample
Quality Assurance Unit	Reports Field visits	#
External Evaluator (s):According to department council External Examiner (s): According to department council	Reports Field visits	#
Stakeholders	Reports Field visits questionnaires	#
Senior students	questionnaires	#
Alumni	questionnaires	#

Annex 6, Program Correlations:

مصفوفة توافق المعايير القومية القياسية العامة لبرامج الماجستير مع المعايير الأكاديمية المعتمدة من كلية الطب جامعة أسيوط لدرجة الماجستير في الأشعة التشخيصية

I- General Academic Reference Standards (GARS) versus Program ARS

1- Graduate attributes

Faculty ARS	NQAAE General ARS for Postgraduate Programs
1- Have the capability to be a scholar, understanding and applying basics, methods and tools of scientific research and clinical audit in *Radio diagnosis.*	1– إجادة تطبيق أساسيات و منهجيات البحث العلمي واستخدام أدواته المختلفة
2- Appraise and utilise scientific knowledge to continuously update and improve clinical practice in *Radio diagnosis.*	2–تطبيق المنهج التحليلي واستخدامه في مجال التخصص
3- Acquire sufficient medical knowledge in the basic biomedical, clinical, behavioural and clinical sciences, medical ethics and medical jurisprudence and apply such knowledge in patient care in *Radio diagnosis.*	3–تطبيق المعارف المتخصصة و دمجها مع المعارف ذات العلاقة في ممارسته المهنية
4- Provide patient care that is appropriate, effective and compassionate for dealing with common health problems and health promotion using evidence-based and update information.	4–إظهار وعيا بالمشاكل الجارية و الرؤى الحديثة في مجال التخصص
5- Identify and share to solve health problems in *Radio diagnosis.*	5–تحديد المشكلات المهنية و إيجاد حلولا لها
6- Acquire all competencies that enable him to provide safe, scientific, ethical and evidence based clinical care including update use of new technology in *Radio diagnosis.*	6–إتقان نطاق مناسب من المهارات المهنية المتخصصة، واستخدام الوسائل التكنولوجية المناسبة بما يخدم ممارسته المهنية

7- Demonstrate interpersonal and communication skills that ensure effective information exchange with individual patients and their families and teamwork with other health professions, the scientific community and the public. 8- Function as supervisor, and trainer in relation to colleagues, medical students and other health professions.	7–التواصل بفاعلية و القدرة على قيادة فرق العمل
9- Acquire decision making capabilities in different situations related to *Radio diagnosis.*	8–اتخاذ القرار في سياقات مهنية مختلفة
10- Show responsiveness to the larger context of the health care system, including e.g. the organisation of health care, partnership with health care providers and managers, practice of cost-effective health care, health economics, and resource allocations.	9– توظيف الموارد المتاحة بما يحقق أعلي استفادة و الحفاظ عليها
11- Be aware of public health and health policy issues and share in system-based improvement of health care.	10–إظهار الوعي بدوره في تنمية المجتمع و الحفاظ على البيئة في ضوء المتغيرات العالمية و الإقليمية
12- Show appropriate attitudes and professionalism.	11–التصرف بما يعكس الالتزام بالنزاهة و المصداقية و الالتزام بقواعد المهنة
13- Demonstrate skills of lifelong learning and maintenance of competence and ability for continuous medical education and learning in subsequent stages in *Radio diagnosis* or one of its subspecialties.	12–تنمية ذاته أكاديميا و مهنيا و قادرا علي التعلم المستمر

2. Academic standard

Faculty ARS	NQAAE General ARS for Postgraduate Programs
2.1.A -Established basic, biomedical, clinical, epidemiological and behavioral sciences related conditions, problems and topics.	2-1-أ-النظريات و الأساسيات المتعلقة بمجال التعلم وكذا في المجالات ذات العلاقة.
2.1.B- The relation between good clinical care of common health problems in *Radio diagnosis* and the welfare of society.	2-1-ب-التأثير المتبادل بين الممارسة المهنية وانعكاسها علي البيئة.
2.1. C- Up to date and recent developments in common problems related to *Radio diagnosis.*	2-1-ج-التطورات العلمية في مجال التخصص.
2.1. D- Ethical and medicolegal principles relevant to practice in the *Radio diagnosis.*	2-1-د-المبادئ الأخلاقية و القانونية للممارسة المهنية في مجال التخصص.
2.1. E-Quality assurance principles related to the good medical practice in *Radio diagnosis.*	2-1-هـ .- مبادئ و أساسيات الجودة في الممارسة المهنية في مجال التخصص
2.1. F- Ethical and scientific basics of medical research.	2-1-و- أساسيات وأخلاقيات البحث العلمي
2.2. A-Correlation of different relevant sciences in the problem solving and management of common diseases of *Radio diagnosis.* 2.2. B- Problem solving skills based on data analysis and evaluation (even in the absence of some) for common clinical situations related to *Radio diagnosis.*	2-2-أ- تحليل و تقييم المعلومات في مجال التخصص والقياس عليها لحل المشاكل

2.2. B- Problem solving skills based on data analysis and evaluation (even in the absence of some) for common clinical situations related to *Radio diagnosis.*	2-2-ب- حل المشاكل المتخصصة مع عدم توافر بعض المعطيات
2.2. A-Correlation of different relevant sciences in the problem solving and management of common diseases of *Radio diagnosis.*	2-2-ج- الربط بين المعارف المختلفة لحل المشاكل المهنية
2.2. C- Demonstrating systematic approach in studying clinical problems relevant to the *Radio diagnosis.*	2-2-د- إجراء دراسة بحثية و /أو كتابة دراسة علمية منهجية حول مشكلة بحثية
2.4.A-Demonstrate practice-based learning and Improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, improvements in patient care and risk management	2-2هـ .- تقييم المخاطر في الممارسات المهنية في مجال التخصص
2.4.A-Demonstrate practice-based learning and Improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, improvements in patient care and risk management	2-2-و- التخطيط لتطوير الأداء في مجال التخصص
2.2.D- Making alternative decisions in different situations in the field of *Radio diagnosis.*	2-2-ز- اتخاذ القرارات المهنية في سياقات مهنية متنوعة
2.3.A- provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. 2.3.B- Demonstrate patient care skills relevant to *Radio diagnosis* for patients with common diseases and problems.	2-3-أ- إتقان المهارات المهنية الأساسية و الحديثة في مجال التخصص
2.3.C- Write and evaluate reports for Situation related to *Radio diagnosis*	2-3-ب- كتابة و تقييم التقارير المهنية

2.3.A- provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. 2.3.B- Demonstrate patient care skills relevant to that speciality for patients with common diseases and problems.	2-3-ج- تقييم الطرق و الأدوات القائمة في مجال التخصص
2.4.D- Demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals.	2-4-أ-التواصل الفعال بأنواعه المختلفة
2.4.A-Demonstrate practice-based learning and improvement skills that investigation and involves evaluation of their own patient care, appraisal and assimilation of scientific evidence, improvements in patient care and risk management 2.4.B- Use all information sources and technology to improve his practice.	2-4-ب- استخدام تكنولوجيا المعلومات بما يخدم الممارسة المهنية
2.4.A-Demonstrate practice-based learning and improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, improvements in patient care and risk management 2.4.B- Use all information sources and technology to improve his practice. 2.4.E-Demonstrate professionalism behavior, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.	2-4-ج- التقييم الذاتي وتحديد احتياجاته التعلمية الشخصية
2.4.A-Demonstrate practice-based	2-4-د- استخدام المصادر المختلفة للحصول على

learning and improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, , improvements in patient care and risk management.	المعلومات و المعارف
2.4. C- Demonstrate skills of teaching and evaluating others.	2-4-هـ .- وضع قواعد ومؤشرات تقييم أداء الآخرين
2.4. F- Demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively use system resources to provide care that is of optimal value.	2-4-و- العمل في فريق ، وقيادة فرق في سياقات مهنية مختلفة
2.4.G- Demonstrate skills of effective time management.	2-4-ز- إدارة الوقت بكفاءة
2.4.H- Demonstrate skills of self and continuous learning.	2-4-ح- التعلم الذاتي و المستمر

Comparison between ARS and ILOS for master degree in Radio diagnosis

(ARS)	(ILOs)
2-1- Knowledge and understanding **2-1-A-** Established basic, biomedical, clinical, epidemiological and behavioral sciences related conditions, problem and topics.	***2-1- Knowledge and understanding*** **2-1-A**- Explain the essential facts and principles of relevant basic sciences including, Pathology, Physics , Radiological Technology & Radiological Anatomy, Radiobiology related to *Radio diagnosis* **2-1-B-** Mention essential facts of clinically supportive sciences including Basics of internal Medicine and general surgery related to *Radio diagnosis* **2-1-C-** Demonstrate sufficient knowledge of etiology, clinical picture, diagnosis, prevention and treatment of the common diseases and situations related to *Radio diagnosis*
2-1-B The relation between good clinical care of common health problem in the *Radio diagnosis* and the welfare of society.	**2-1-H-** State the impact of common health problems in the field of *Radio diagnosis* on the society and how good clinical practice improve these problems.
2-1-C- Up to date and recent developments in common problems related to the field of *Radio diagnosis*.	**2-1-C-** Demonstrate sufficient knowledge of etiology, clinical picture, diagnosis, prevention and treatment of the common diseases and situations related to *Radio diagnosis* **2-1-D-** Give the recent and update developments in the pathogenesis, diagnosis, prevention and treatment of common diseases related to *Radio diagnosis*.
2-1-D- Ethical and medicolegal Principles relevant to practice in the *Radio*	**2-1-E-** Mention the basic ethical and medicolegal principles that should be applied in practice and are relevant to the field of *Radio diagnosis*

diagnosis field.	
2-1-E-Quality assurance principles related to the good medical practice in the *Radio diagnosis* field.	**2-1-F-** Mention the basics and standards of quality assurance to ensure good clinical practice in the field of *Radio diagnosis .*
2-1-F- Ethical and scientific basics of medical research.	**2-1-G-** Mention the ethical and scientific principles of medical research methodology**.**
***2-2- Intellectual skills*:**	***2-2- Intellectual skills:***
2-2-A-Correlation of different relevant sciences in the problem solving and management of common diseases of the *Radio diagnosis*	**2-2-A-** Correlate the facts of relevant basic and clinically supportive sciences with clinical reasoning, diagnosis and management of common diseases of the *Radio diagnosis*
2-2-B-Problem solving skills based on data analysis and evaluation (even in the absence of some) for common clinical situations related to *Radio diagnosis*	**2-2-B-** Demonstrate an investigatory and analytic thinking approach (problem solving) to common clinical situations related to *Radio diagnosis*
2-2-C- Demonstrating systematic approach in studding clinical problems relevant to the *Radio diagnosis* field.	**2-2-C-** Design and /or present a case or review (through seminars/journal clubs.) in one or more of common clinical problems relevant to the *Radio diagnosis* field.
2-2-D Making alternative decisions in different situations in the field of the *Radio diagnosis*.	**2-2-D-** Formulate management plans and alternative decisions in different situations in the field of the *Radio diagnosis*.

continuous (ARS)	continuous (ILOs)
2-3- Clinical skills: **2-3-A-** Provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. **2-3-B-** Demonstrate patient care skills relevant to that *Radio diagnosis* for patients with common diseases and problems.	***2/3/1/Practical skills (Patient Care :)*** **2-3-1-A-** Obtain proper history and examine patients in caring and respectful behaviors. **2-3-1-B-** Make informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment for common conditions related to *Radio diagnosis* **2-3-1-C-** Carry out patient management plans for common conditions related to *Radio diagnosis* **2-3-1-D-** Use information technology to support patient care decisions and patient education in common clinical situations related to *Radio diagnosis* **2-3-1-E-** Perform competently non invasive and invasive procedures considered essential for the *Radio diagnosis* **2-3-1-F-** Provide health care services aimed at preventing health problems related to *Radio diagnosis* **2-3-1-G-** Provide patient-focused care in common conditions related to *Radio diagnosis,* while working with health care professionals, including those from other disciplines.
2-3-C- Write and evaluate reports for situations related to the field of *Radio diagnosis*	**-3-1-H** Write competently all forms of patient charts and sheets including reports evaluating these charts and sheets. (Write a consultation note, Inform patients of a diagnosis and therapeutic plan, completing and maintaining medical records).

2-4- General skills	***2/3/2 General skills***
2-4-A- Demonstrate practice-based learning and improvement skills that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, improvements in patient care and risk management	**2-3-2-A-** Perform practice-based improvement activities using a systematic methodology (share in audits and risk management activities and use logbooks). **2-3-2-B-** Appraises evidence from scientific studies. **2-3-2-C-** Conduct epidemiological studies and surveys.
2-4-B- Use all information sources and technology to improve his practice.	**2-3-2-C-** Conduct epidemiological studies and surveys. **2-3-2-D**.Perform data management including data entry and analysis and using information technology to manage information, access on-line medical information; and support their own education.
2-4-C- Demonstrate skills of teaching and evaluating others.	**2-3-2-E-** Facilitate learning of students other health care professionals including their evaluation and assessment.
2-4-D- Demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals.	**2-3-2-F-** Maintain therapeutic and ethically sound relationship with patients. **2-3-2-G-** Elicit information using effective nonverbal, explanatory, questioning, and writing skills. **2-3-2-H-** Provide information using effective nonverbal, explanatory, questioning, and writing skills. **2-3-2-I-** Work effectively with others as a member of a health care team or other professional group.
2-4-E-Demonstrate professionalism behaviors, as manifested through a commitment to carrying out professional responsibilities, adherence to	**2-3-2-J-** Demonstrate respect, compassion, and integrity; a responsiveness to the needs of patients and society. **2-3-2-K**- Demonstrate a commitment to

ethical principles, and sensitivity to a diverse patient population.	ethical principles including provision or withholding of clinical care, confidentiality of patient information, informed consent, business practices. **2-3-2-L**-Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities.
2-4-F- Demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively use system resources to provide care that is of optimal value.	**2-3-2-M**-Work effectively in relevant health care delivery settings and systems including good administrative and time management **2-3-2-N-** Practice cost-effective health care and resource allocation that does not compromise quality of care. **2-3-2-O**- Assist patients in dealing with system complexities.
2-4-G- Demonstrate skills of effective time management	**2-3-2-M**-Work effectively in relevant health care delivery settings and systems including good administrative and time management
2-4-H- Demonstrate skills of self and continuous learning.	**2-3-2-A-** Perform practice-based improvement activities using a systematic methodology (share in audits and risk management activities and use logbooks).

III-Program matrix
Knowledge and Understanding

Course	Program covered ILOs							
	2/1/A	2/1/B	2/1/C	2/1/D	2/1/E	2/1/F	2/1/G	2/1/H
Course 1: Radiological Physics**.**	✓							
Course2: Radiological Technology	✓							
Course 3 : Radiological Anatomy	✓							
Course 4: Radiobiology and radiological services	✓							
Course 5: Internal Medicine and Surgery and Pathology	✓	✓	✓	✓	✓	✓	✓	✓
Course 6 : Radio diagnosis	✓	✓	✓	✓	✓	✓	✓	✓

Intellectual

Course	Program covered ILOs			
	2/2/A	2/2/B	2/2/C	2/2/D
Course 1: Radiological Physics**.**	✓	✓		
Course2: Radiological Technology	✓	✓		
Course 3 : Radiological Anatomy	✓	✓		
Course 4: Radiobiology and radiological services	✓	✓		
Course 5: Internal Medicine and Surgery and Pathology	✓	✓	✓	✓
Course 6 : Radio diagnosis	✓	✓	✓	✓

Practical Skills (Patient Care)

Course	Program covered ILOs							
	2/3/1/ A	2/3/1/ B	2/3/1/ C	2/3/1/ D	2/3/1/ E	2/3/1/ F	2/3/1/ G	2/3/1/ H
Course 1: Radiological Physics**.**				✓				
Course2: Radiological Technology				✓	✓			
Course 3 : Radiological Anatomy		✓		✓				
Course 4: Radiobiology and radiological services								
Course 5: Internal Medicine and Surgery and Pathology	✓	✓	✓	✓	✓	✓	✓	✓
Course 6 : Radio diagnosis	✓	✓	✓	✓	✓	✓	✓	✓

General Skills

Course	Program covered ILOs							
	2/3/2 /A	2/3/2 /B	2/3/2 /C	2/3/2 /D	2/3/2 /E	2/3/2 /F	2/3/2 /G	2/3/2 /H
Course 1: Radiological Physics**.**	✓	✓	✓	✓	✓	✓	✓	✓
Course2: Radiological Technology	✓	✓	✓	✓	✓	✓	✓	✓
Course 3 : Radiological Anatomy	✓				✓			
Course 4: Radiobiology and radiological services	✓	✓	✓	✓	✓	✓	✓	✓
Course 5: Internal Medicine and Surgery and Pathology	✓	✓	✓	✓	✓	✓	✓	✓
Course 6 : Radio diagnosis	✓	✓	✓	✓	✓	✓	✓	✓

General Skills

Course	Program covered ILOs						
	2/3/2/ I	2/3/2/ J	2/3/2/ K	2/3/2/ L	2/3/2/ M	2/3/2/ N	2/3/2/ O
Course 1: Radiological Physics**.**	✓	✓	✓	✓	✓	✓	✓
Course2: Radiological Technology	✓	✓	✓	✓	✓	✓	✓
Course 3 : Radiological Anatomy	✓		✓		✓	✓	
Course 4: Radiobiology and radiological services	✓	✓	✓	✓	✓	✓	✓
Course 5: Internal Medicine and Surgery and Pathology	✓	✓	✓	✓	✓	✓	✓
Course 6 : Radio diagnosis	✓	✓	✓	✓	✓	✓	✓

Annex 7,
Additional information:

Department information:

Radiological department include:

*Multiple X-ray machines.
*CR units (computerized radiography).
*Ultra-sound unit include ultrasound black and white machines and color Duplex machines.
*Digital subtraction unit for all special techniques.
*Angiographic unit for vascular imaging and interventional vascular procedures.
*Computerized tomography units (single slice CT, Helical CT and Multi-detectors CT).
*Picture archiving communicating system (PACS).
*Magnetic resonance imaging unit.
*Pediatric radiology unit.
*Chest X-ray in patient unit.
*Bone densitometry unit.
*Daily ultrasound out patient clinics.
*Daily X-ray out patient clinics.
*Seminar room with data show.
*Scientific Library (radiological books), MD, MSc thesis.

Department quality control insurance for completing the program:

- Evaluation by the Department head and staff members.
- Regular assessments.
- Log book monitoring.
- Recent equipments and Specialized Units.

(End of the program specifications)