

# Republic of Yemen

## Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY for MEDICALS & APPLIED  
SCIENCES



## Faculty of Medicine

Bachelor Program of Medicine and Surgery

### Course Specification of

### Diagnostic Radiology

### Course Code. (A21P413)

2023



T4: This Template is Developed and Approved by CAQA-Yemen, 2023

Prepared by:	Reviewed by:	Head of department	Quality Unit:	Dean of Medicine Faculty	Center of Development and Quality Assurance Dean
Dr. Saba`a Amer	Assoc. prof. Sadeq Saad Abdulmogni	Dr. Saba`a Amer	Dr. Fadhl Shujaa Al-deen	Dr. Salwa Al-Ghomeri	

## I. General Information:

1.	Course Title:	<b>Diagnostic Radiology</b>				
2.	Course Code:	A21P413				
3.	Credit Hours:	Credit Hours	Theory Contact Hours		Practical Contact Hours	
			Lecture	Tutorial/ Seminar	Lab	Clinical
		3	2	--		3
4.	Level/ Semester at which this Course is offered:	5 <sup>th</sup> Level / 1 <sup>st</sup> Semester				
5.	Pre –Requisite (if any):	All systems				
6.	Co –Requisite (if any):	None				
7.	Program (s) in which the Course is Offered:	Bachelor of Medicine and surgery				
8.	Language of Teaching the Course:	English				
9.	Location of Teaching the Course:	Faculty of Medicine				
10.	Prepared by:	Dr. Saba'a Amer				
11.	Date and Number of Approval by Council:	2023				

## II. Course Description:

The aim of radiology course is to provide students with fundamental knowledge of basic and applied concepts related to Radiology. Radiology course introduces information about many topics including an overview of basic radiological techniques like X-rays, ultrasound, CT scan, and MRI, and the application and interpretation of radiological findings in various diseases,

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III. Course Intended Learning Outcomes (CILOs) : Upon successful completion of the course, students will be able to:		Referenced PILOs		
<b>A. Knowledge and Understanding:</b>		<b>I, P or M/A</b>		
a1	Describe the advantages and disadvantages of X-rays, ultrasound, CT scan, and MRI.	<b>A</b>	<b>A3</b>	Explain the pathological and pathogenesis changes in various diseases, and their etiological triggers including genetic, developmental, infectious, metabolic, endocrinal, autoimmune, neoplastic, traumatic, degenerative and occupational factors.
a2	Enumerate the application of X-rays, ultrasound, CT scan, and MRI in diagnosis various diseases.	<b>A</b>		
<b>B. Intellectual Skills:</b>				
b1	Integrate between different radiological techniques for differential diagnosis of diseases	<b>A</b>	<b>B1</b>	Compare between normal and abnormal conditions and predict the appropriate treatment or intervention.
<b>C. Professional and Practical Skills:</b>				
c1	Choose appropriate radiological technique for patients for diagnosis diseases	<b>P</b>	<b>C1</b>	Perform complete clinical examination and precise investigations to reach the final diagnosis.
c2	Read radiographic images	<b>A</b>	<b>C3</b>	Carry out routine medical procedure and demonstrate the ability of using common medical tools required for diagnosis and management with highly qualified competency.
<b>D. Transferable Skills:</b>				
d1	Use the information technology and	<b>P</b>	<b>D1</b>	Communicate with professionals,

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	internet resources efficiently for self-learning and gaining up-to-date information in the areas of interest.			patients, their families and the community through verbal, written and other non-verbal means.
d2	Act independently or collaboratively as a member of teamwork and communicate effectively with others.	A	D2	Work individually or in a team and develop lifelong learning using up to date technology that help in understanding the diseases and its control and prevention.

I= Introduced, P=Practiced or M/A= Mastered/Advanced

**(A) Alignment of Course Intended Learning Outcomes (Knowledge and Understanding) to Teaching Strategies and Assessment Methods:**

Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
a1 Describe the advantages and disadvantages of X-rays, ultrasound, CT scan, and MRI.	<ul style="list-style-type: none"> <li>▪ Interactive lectures</li> <li>▪ Discussion</li> <li>▪ Office hours</li> <li>▪ Self-learning</li> </ul>	<ul style="list-style-type: none"> <li>▪ Final written exam</li> </ul>
a2 Enumerate the application of X-rays, ultrasound, CT scan, and MRI in diagnosis various diseases.	<ul style="list-style-type: none"> <li>▪ Interactive lectures</li> <li>▪ Discussion</li> <li>▪ Case studies</li> <li>▪ Office hours</li> <li>▪ Self learning</li> </ul>	<ul style="list-style-type: none"> <li>▪ Final written exam</li> <li>▪ Final clinical exam</li> </ul>

**(B) Alignment of Course Intended Learning Outcomes (Intellectual Skills) to Teaching Strategies and Assessment Methods:**

Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
b1 Integrate between different radiological techniques for differential diagnosis of diseases	<ul style="list-style-type: none"> <li>▪ Interactive lectures</li> <li>▪ Seminars</li> <li>▪ Discussion</li> <li>▪ Case studies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Final written exam</li> <li>▪ Final clinical exam</li> </ul>

**(C) Alignment of Course Intended Learning Outcomes (Professional and Practical Skills) to Teaching Strategies and Assessment Methods:**

Course Intended Learning Outcomes	Teaching Strategies	Assessment Strategies
c1 Choose appropriate	<ul style="list-style-type: none"> <li>▪ Training</li> </ul>	<ul style="list-style-type: none"> <li>▪ Final clinical exam</li> </ul>

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	radiological technique for patients for diagnosis diseases	<ul style="list-style-type: none"> <li>Case studies</li> </ul>	<ul style="list-style-type: none"> <li>OSCE</li> </ul>
c2	Read radiographic images	<ul style="list-style-type: none"> <li>Interactive lectures</li> <li>Case studies</li> </ul>	<ul style="list-style-type: none"> <li>Final clinical exam</li> <li>OSCE</li> </ul>
<b>(D) Alignment of Course Intended Learning Outcomes (Transferable Skills) to Teaching Strategies and Assessment Methods:</b>			
	<b>Course Intended Learning Outcomes</b>	<b>Teaching Strategies</b>	<b>Assessment Strategies</b>
d1	Use the information technology and internet resources efficiently for self-learning and gaining up-to-date information in the areas of interest.	<ul style="list-style-type: none"> <li>Seminars</li> <li>Discussion</li> <li>Case studies</li> <li>Self-learning</li> </ul>	<ul style="list-style-type: none"> <li>Oral discussion</li> <li>Homework</li> <li>Teamwork</li> </ul>
d2	Act independently or collaboratively as a member of teamwork and communicate effectively with others.	<ul style="list-style-type: none"> <li>Seminars</li> <li>Discussion</li> <li>Case studies</li> <li>Self-learning</li> </ul>	<ul style="list-style-type: none"> <li>Oral discussion</li> <li>Homework</li> <li>Teamwork</li> </ul>

#### IV. Course Contents:

##### A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Week due	Contact Hours	Learning Outcomes (CILOs)
1	BASIC RADIOLOGY	An introduction to imaging modalities and Radiological techniques: <ul style="list-style-type: none"> <li>Conventional radiography</li> <li>Fluoroscopy</li> <li>Mammography</li> <li>Ultrasonography</li> <li>Computed tomography(CT)</li> <li>Angiography</li> <li>Magnetic resonance imaging (MRI)</li> <li>Nuclear Medicine</li> <li>Interventional radiology (IR):               <ul style="list-style-type: none"> <li>Non- Vascular</li> </ul> </li> </ul>	1st	4	a1, b1, ,d1.d2

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No.	Units/Topics List	Sub Topics List	Week due	Contact Hours	Learning Outcomes (CILOs)
		<ul style="list-style-type: none"> <li>Vascular</li> </ul> -Patient Safety -Radiographic contrast media -Radiation protection -The referral to radiological imaging.			
2	CHEST IMAGING	Imaging modalities & Technical factors -Review of Normal chest Radioanatomy -Emergency of chest <ul style="list-style-type: none"> <li>-Interpretation of chest x ray</li> </ul> - Chest CT scan abnormalities -Radiology of common chest Pathology <ul style="list-style-type: none"> <li>Consolidation/ pneumonia</li> <li>Atelectasis / collapse</li> <li>ARDS</li> <li>Pneumothorax</li> <li>Pleural disease / effusion</li> <li>Lung masses / nodules</li> <li>Cavitation</li> <li>Chest wall pathology</li> <li>Abnormal hila</li> <li>Interstitial disease</li> <li>Congestive heart failure.</li> <li>Aorta &amp; heart</li> <li>Diaphragm</li> </ul>		8	a2, b1, ,d2
3	CARDIAC IMAGING	-RADIOLOGICAL ANATOMY OF THE HEART : (Cardiothoracic ratio & Normal cardiac contour) -IMAGING TECHNIQUES : (chest radiography , Echocardiography, CT/Coronary CT angiography, MRI, Radionuclide Studies) SPECIFIC CARDIAC DISEASE <ul style="list-style-type: none"> <li>Heart failure</li> <li>Ischemic heart disease</li> <li>Hypertensive cardiac disease</li> <li>Cardiomyopathy</li> <li>Valvular heart disease</li> <li>Pericardial effusion</li> <li>Subacute bacterial endocarditis</li> <li>intra-cardiac masses</li> </ul> Congenital heart disease		4	a2, b1, ,d2

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No.	Units/Topics List	Sub Topics List	Week due	Contact Hours	Learning Outcomes (CILOs)
4	NEURO-RADIOLOGY	-Radiological Modalities: -Normal CNS anatomy -Common CNS Pathological conditions <ul style="list-style-type: none"> <li>• Tumors</li> <li>• Infection</li> <li>• Head Trauma</li> <li>• Common spinal injuries.</li> <li>• Vascular disease</li> <li>• Miscellaneous:</li> <li>• Emergency “don’t miss” findings</li> </ul> -Invasive procedures -Appropriate imaging algorithms for common diagnostic situations including cost-effective imaging		4	a2, b1, ,d2
5	HEAD & NECK IMAGING	Radiological anatomy : Radiological Modalities Para Nasal Sinuses pathologies Nasopharynx Larynx Orbital pathologies Salivary glands Neck cystic masses Thyroid imaging Parathyroid gland imaging Causes of enlarged cervical lymph nodes		2	a2, b1, ,d2
6	ABDOMINAL IMAGING	Radiological modalities -Interpretation of plain abdominal radiograph -Abdominal trauma -Focused abdominal sonography for trauma/ FAST SCAN -Specific organs traumatic injury -Acute abdomen imaging -Common abdominal pathologies -The liver -Biliary system & GB -The pancreas -The adrenal glands -URINARY SYSTEM		8	a2, b1, ,d2

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No.	Units/Topics List	Sub Topics List	Week due	Contact Hours	Learning Outcomes (CILOs)
		<ul style="list-style-type: none"> <li>• Radiological modalities :</li> <li>• Vesico-ureteric reflux</li> <li>• Hydronephrosis</li> </ul> Urolithiasis			
7	Musculoskeletal IMAGING	Bone and joint diseases : <ul style="list-style-type: none"> <li>- Imaging techniques</li> <li>- Bone anatomy</li> <li>- The radiological signs of bone disease</li> <li>- Bone diseases</li> <li>- Abnormal bone densities</li> <li>- Alteration of trabecular pattenen and bone shape</li> <li>- Infection</li> <li>- Trauma &amp; emergencies</li> <li>- Specific types of Fractures</li> <li>- Arthritis /arhthropathies</li> </ul> The Spine: <ul style="list-style-type: none"> <li>- Imaging modalities</li> <li>- Spinal abnormalities</li> <li>- Tumors</li> <li>- Infection</li> <li>- Trauma</li> <li>- Degenerative diseases</li> </ul> Congenital	2 <sup>nd</sup>	8	a2, b1, ,d2
8	Pediatric Imaging	-Radiological modalities: -Pediatric Cardiovascular system : -Pediatric Respiratory system: -Pediatric abdomen -Pediatric MSK system -CT scan of the pediatric head -How to read a plain radiograph: step by step		4	a2, b1, ,d2
9	Gynecological Imaging	-Normal radiological anatomical appearance -Radiological modalities used in gynecological pathology -Uro -gynecology imaging. -Interventional Radiology / IR Breast Imaging as part of women		2	a2, b1, ,d1,d2

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No.	Units/Topics List	Sub Topics List	Week due	Contact Hours	Learning Outcomes (CILOs)
		imaging Common Gynecological Pathologies Uterine pathologies Ovarian pathologies			
10	Obstetric Imaging	Radiological modalities used in obstetric imaging: <ul style="list-style-type: none"> <li>• First trimester sonography</li> <li>• Second trimester sonography / TIFFA (targeted imaging for fetal anomalies)</li> <li>• Third trimester sonography</li> <li>• 3D/4D sonography.</li> </ul> The placenta& umbilical cord pathologies Imaging of abnormal pregnancy : Amniotic fluid volume assessment Gestational trophoblastic disease/GTD Fetal congenital anomalies Failed / abnormal early pregnancy/ abortions Intrauterine fetal death / IUFD Ectopic pregnancy Multiple pregnancy Interventional radiology application in obstetric issues		4	a2, b1, ,d2
11	Breast medical imaging	-Radiological anatomy of the breast -Radiological modalities <ul style="list-style-type: none"> <li>• Breast ultrasound</li> <li>• Mammography</li> <li>• Galactography/ breast ductography</li> <li>• Breast MRI</li> </ul> -Contrast enhanced dynamic MRI study with kinetic curves assessment -Congenital abnormalities -Breast cancer and metastasis -Pregnancy & lactation -Associated Breast Disease		4	a2, b1, ,d1,d2

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No.	Units/Topics List	Sub Topics List	Week due	Contact Hours	Learning Outcomes (CILOs)
		-Interventional radiology of breast abnormalities -Post operative breast imaging -Male breast imaging -Breast imaging reporting and data system/ BI-RADS			
12	<b>Final Theoretical Exam</b>	-MCQs and essay questions & OSCE	16 <sup>th</sup>	2	a1,a2, b1,
<b>Number of Weeks /and Units Per Semester</b>			<b>2W</b>	<b>54</b>	

#### B. Case Studies and Practical Aspect:

No.	Tasks/ Experiments	Week Due	Contact Hours	Learning Outcomes (CILOs)
1	Watching and reading of chest image of patients in medical wards in hospital	1 <sup>st</sup>	9	a2,c1,c2, ,d1, d2
2	Watching and reading of x ray for bones in emergency room		6	a2,c1,c2, ,d1, d2
3	Share with radiologist in radiology center in watching IVP and cystography		3	a2,c1,c2, ,d1, d2
4	Share in gynecology department to read Hysterosalpingography	2 <sup>nd</sup>	3	a2,c1,c2, ,d1, d2
5	Share in mammography center to diagnosed the common diseases		3	a2,c1,c2, ,d1, d2
6	Share sonographic specialist to identify common diseases in abdomen and pelvic organs		3	a2,c1,c2, ,d1, d2
7	Share with neurological dr the common diseases and emergency disorders e.g infraction and hemorrhage in CT and MRI		3	a2,c1,c2, ,d1, d2
8	Share with paediatric dr the image of chest and GIT		3	a2,c1,c2, ,d1,

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No.	Tasks/ Experiments	Week Due	Contact Hours	Learning Outcomes (CILOs)
	cases in congenital anomalies and common diseases			d2
9	Final Clinical Exam	15 <sup>th</sup>	3	a2,c1,c2,b1,d2
<b>Number of Weeks /and Units Per Semester</b>		<b>2</b>	<b>36</b>	

### V. Teaching Strategies of the Course:

Lectures  
Discussion  
Clinical training  
Self-Learning  
Presentation  
Seminars  
Case studies

### VI. Assessment Methods of the Course:

Final Written Exam  
Homework & Team work  
Final Clinical Exam  
Oral Discussion  
OSCE

### VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	Homework & team work & Oral Discussion	2 <sup>nd</sup>	20	20 %	d1,d2
2	Final Clinical Exam	15 <sup>th</sup>	30	30 %	a2, b1, c1,c2
3	Final Theoretical Exam & OSCE	16 <sup>th</sup>	50	50 %	a1,a2, b1, c1,c2
<b>Total</b>			<b>100</b>	<b>100%</b>	

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## IX. Learning Resources:

### 1- Required Textbook(s):

- 1- Lee Alexander Grant, Nyree Griffin (2019). Grainger & Allison's Diagnostic Radiology. Essentials. 2nd edition. United State of America: Elsevier.
- 2- Pellegrino, S., & Mansi, L. Andrea Rockall, Andrew Hatrick, Peter Armstrong, Martin Wastie (Eds.) (2014).: **Diagnostic Imaging (7th edn.)**. UK John Wiley & Sons, Chichester,

### 2- Essential References:

- 1- Dag Wormanns (2020). Diagnostic Imaging of the Chest. 1st edition. United State of America: Thieme Publishing Group.
- 2- Alberto Signore, Ana María Quintero (2013). Diagnostic Imaging of Infections and Inflammatory Diseases: A Multidisciplinary. 1st edition. United State of America: John Wiley & Sons.
- 3- Herring, W. (2007). **Learning radiology: Recognizing the basics. 5<sup>th</sup> edition** Elsevier Health Sciences.
- 4- Jacob Mandell (2013). Core Radiology: A Visual Approach to Diagnostic Imaging. 1st edition. UK: Cambridge University Press.

### 3- Electronic Materials and Web Sites etc.:

#### Websites:

- 1- Radiopaedia  
<https://radiopaedia.org/>
- 2- Learning radiology  
<http://www.learningradiology.com/>
- Radiopaedia  
<https://radiopaedia.org/articles/radiographics>
- Radiology assistant  
<https://radiologyassistant.nl/>
- RadioGraphics - RSNA Journals  
<https://pubs.rsna.org/journal/radiographics>
- AJR Radiology  
<https://www.ajronline.org/>

## X. Course Policies: (Based on the Uniform Students' By law (2007))

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1	<b>Class Attendance:</b> Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	<b>Tardiness:</b> A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	<b>Exam Attendance/Punctuality:</b> No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	<b>Assignments &amp; Projects:</b> Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	<b>Cheating:</b> Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	<b>Forgery and Impersonation:</b> Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	<b>Other policies:</b> The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

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## Faculty of Medicine

### Bachelor Program of Medicine and Surgery

## Course Plan (Syllabus) of

### Diagnostic Radiology

### Course Code. (A21P413)

I. Information about Faculty Member Responsible for the Course:							
Name of Faculty Member:		Office Hours					
Location & Telephone No.:	----						
E-mail:	--@--.--	SAT	SUN	MON	TUE	WED	THU

2023

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## II. Course Identification and General Information:

Course Title:	Diagnostic Radiology				
Course Code:	A21P413				
Credit Hours:	Credit Hours	Theory Contact Hours		Practical Contact Hours	Clinical
		Lecture	Tutorial/Seminar	Lab	
	3	2	--	3	
Level/ Semester at which this Course is offered:	5th Level / 1st Semester				
Pre –Requisite (if any):	All systems				
Co –Requisite (if any):	None				
Program (s) in which the Course is Offered:	Bachelor of Medicine and surgery				
Language of Teaching the Course:	English				
Location of Teaching the Course:	Faculty of Medicine				
Prepared by:	Dr. Saba,a Amer				
11	Date and Number of Approval by Council:	2023			

## III. Course Description:

The aim of radiology course is to provide students with fundamental knowledge of basic and applied concepts related to Radiology. Radiology course introduces information about many topics including an overview of basic radiological techniques like X-rays, ultrasound, CT scan, and MRI, and the application and interpretation of radiological findings in various diseases,

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#### IV. Course Intended Learning Outcomes (CILOs) :

Upon successful completion of the Course, student will be able to:

A. Knowledge and Understanding:	
a1	Describe the advantages and disadvantages of X-rays, ultrasound, CT scan, and MRI.
a2	Enumerate the application of X-rays, ultrasound, CT scan, and MRI in diagnosis various diseases.
B. Intellectual Skills:	
b1	Integrate <b>between different radiological</b> techniques for differential diagnosis of diseases
C. Professional and Practical Skills:	
c1	Choose appropriate radiological technique for patients for diagnosis diseases
c2	Read radiographic images
D. Transferable Skills:	
d1	Use the information technology and internet resources efficiently for self-learning and gaining up-to-date information in the areas of interest.
d2	Act independently or collaboratively as a member of teamwork and communicate effectively with others.
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## IV. Course Contents:

### A. Theoretical Aspect:

No.	Units/Topics List	Sub Topics List	Week due	Contact Hours
1	BASIC RADIOLOGY	<p>An introduction to imaging modalities and Radiological techniques:</p> <ul style="list-style-type: none"> <li>• Conventional radiography</li> <li>• Fluoroscopy</li> <li>• Mammography</li> <li>• Ultrasonography</li> <li>• Computed tomography(CT)</li> <li>• Angiography</li> <li>• Magnetic resonance imaging (MRI )</li> <li>• Nuclear Medicine</li> <li>• Interventional radiology (IR): <ul style="list-style-type: none"> <li>• Non- Vascular</li> <li>• Vascular</li> </ul> </li> </ul> <p>-Patient Safety -Radiographic contrast media -Radiation protection -The referral to radiological imaging.</p>	1st	4
2	CHEST IMAGING	<p>Imaging modalities &amp; Technical factors -Review of Normal chest Radioanatomy -Emergency of chest -Interpretation of chest x ray - Chest CT scan abnormalities -Radiology of common chest Pathology</p> <ul style="list-style-type: none"> <li>• Consolidation/ pneumonia</li> <li>• Atelectasis / collapse</li> <li>• ARDS</li> <li>• Pneumothorax</li> <li>• Pleural disease / effusion</li> <li>• Lung masses / nodules</li> <li>• Cavitation</li> </ul>		8

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No.	Units/Topics List	Sub Topics List	Week due	Contact Hours
		<ul style="list-style-type: none"> <li>Chest wall pathology</li> <li>Abnormal hila</li> <li>Interstitial disease</li> <li>Congestive heart failure.</li> <li>Aorta &amp; heart</li> <li>Diaphragm</li> </ul>		
3	CARDIAC IMAGING	<p>-RADIOLOGICAL ANATOMY OF THE HEART : (Cardiothoracic ratio &amp; Normal cardiac contour)</p> <p>-IMAGING TECHNIQUES : (chest radiography , Echocardiography, CT/Coronary CT angiography, MRI, Radionuclide Studies)</p> <p>SPECIFIC CARDIAC DISEASE</p> <ul style="list-style-type: none"> <li>Heart failure</li> <li>Ischemic heart disease</li> <li>Hypertensive cardiac disease</li> <li>Cardiomyopathy</li> <li>Valvular heart disease</li> <li>Pericardial effusion</li> <li>Subacute bacterial endocarditis</li> <li>intra-cardiac masses</li> </ul> <p>Congenital heart disease</p>		4
4	NEURO-RADIOLOGY	<p>-Radiological Modalities:</p> <p>-Normal CNS anatomy</p> <p>-Common CNS Pathological conditions</p> <ul style="list-style-type: none"> <li>Tumors</li> <li>Infection</li> <li>Head Trauma</li> <li>Common spinal injuries.</li> <li>Vascular disease</li> <li>Miscellaneous:</li> <li>Emergency “don’t miss” findings</li> </ul> <p>-Invasive procedures</p> <p>-Appropriate imaging algorithms for common diagnostic situations including cost-effective imaging</p>		4
5	HEAD & NECK IMAGING	<p>Radiological anatomy :</p> <p>Radiological Modalities</p> <p>Para Nasal Sinuses pathologies</p> <p>Nasopharynx</p>		2

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No.	Units/Topics List	Sub Topics List	Week due	Contact Hours
		Larynx Orbital pathologies Salivary glands Neck cystic masses Thyroid imaging Parathyroid gland imaging Causes of enlarged cervical lymph nodes		
6	ABDOMINAL IMAGING	Radiological modalities -Interpretation of plain abdominal radiograph -Abdominal trauma -Focused abdominal sonography for trauma/ FAST SCAN -Specific organs traumatic injury -Acute abdomen imaging -Common abdominal pathologies -The liver -Biliary system & GB -The pancreas -The adrenal glands -URINARY SYSTEM <ul style="list-style-type: none"> <li>• Radiological modalities :</li> <li>• Vesico-ureteric reflux</li> <li>• Hydronephrosis</li> </ul> Urolithiasis		8
7	Musculoskeletal IMAGING	Bone and joint diseases : <ul style="list-style-type: none"> <li>- Imaging techniques</li> <li>- Bone anatomy</li> <li>- The radiological signs of bone disease</li> <li>- Bone diseases</li> <li>- Abnormal bone densities</li> <li>- Alteration of trabecular pattenen and bone shape</li> <li>- Infection</li> <li>- Trauma &amp; emergencies</li> <li>- Specific types of Fractures</li> <li>- Arthritis /arhthropathies</li> </ul> The Spine: <ul style="list-style-type: none"> <li>- Imaging modalities</li> <li>- Spinal abnormalities</li> <li>- Tumors</li> <li>- Infection</li> </ul>	2 <sup>nd</sup>	8

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No.	Units/Topics List	Sub Topics List	Week due	Contact Hours
		- Trauma - Degenerative diseases Congenital		
8	Pediatric Imaging	-Radiological modalities: -Pediatric Cardiovascular system : -Pediatric Respiratory system: -Pediatric abdomen -Pediatric MSK system -CT scan of the pediatric head -How to read a plain radiograph: step by step		4
9	Gynecological Imaging	-Normal radiological anatomical appearance -Radiological modalities used in gynecological pathology -Uro -gynecology imaging. -Interventional Radiology / IR Breast Imaging as part of women imaging Common Gynecological Pathologies Uterine pathologies Ovarian pathologies		2
10	Obstetric Imaging	Radiological modalities used in obstetric imaging: <ul style="list-style-type: none"> <li>• First trimester sonography</li> <li>• Second trimester sonography / TIFFA (targeted imaging for fetal anomalies)</li> <li>• Third trimester sonography</li> <li>• 3D/4D sonography.</li> </ul> The placenta& umbilical cord pathologies Imaging of abnormal pregnancy : Amniotic fluid volume assessment Gestational trophoblastic disease/GTD Fetal congenital anomalies Failed / abnormal early pregnancy/ abortions Intrauterine fetal death / IUFD Ectopic pregnancy Multiple pregnancy Interventional radiology application in obstetric issues		4
11	Breast medical	-Radiological anatomy of the breast		4

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No.	Units/Topics List	Sub Topics List	Week due	Contact Hours
	imaging	-Radiological modalities <ul style="list-style-type: none"> <li>• Breast ultrasound</li> <li>• Mammography</li> <li>• Galactography/ breast ductography</li> <li>• Breast MRI</li> </ul> -Contrast enhanced dynamic MRI study with kinetic curves assessment -Congenital abnormalities -Breast cancer and metastasis -Pregnancy & lactation -Associated Breast Disease -Interventional radiology of breast abnormalities -Post operative breast imaging -Male breast imaging -Breast imaging reporting and data system/ BI-RADS		
12	<b>Final Theoretical Exam</b>	-MCQs and essay questions & OSCE	16 <sup>th</sup>	2
<b>Number of Weeks /and Units Per Semester</b>			<b>2W</b>	<b>54</b>

### B. Case Studies and Practical Aspect:

No.	Tasks/ Experiments	Week Due	Contact Hours
1	Watching and reading of chest image of patient s in medical wards in hospital	1 <sup>st</sup>	9
2	Watching and reading of x ray for bones in emergency room		6
3	Share with radiologist in radiology center in watching IVP and cystography		3
4	Share in gynecology department to read Hysterosalpingography		3
5	Share in mammography center to diagnosed the		3

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No.	Tasks/ Experiments	Week Due	Contact Hours
	common diseases	2 <sup>nd</sup>	
6	Share sonographic specialist to identify common diseases in abdomen and pelvic organs		3
7	Share with neurological dr the common diseases and emergency disorders e.g infraction and hemorrhage in CT and MRI		3
8	Share with paediatric dr the image of chest and GIT cases in congenital anomalies and common diseases		3
9	Clinical Exam	15 <sup>th</sup>	3
<b>Number of Weeks /and Units Per Semester</b>		<b>2</b>	<b>36</b>

## V. Teaching Strategies of the Course:

Lectures  
Discussion  
Clinical training  
Self -Learning  
Presentation  
Seminars  
Case Study

## VI. Assessment Methods of the Course:

Final Written Exam  
Final Clinical Exam  
Homework & Team work  
Oral Discussion  
OSCE

## VIII. Schedule of Assessment Tasks for Students During the Semester:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
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No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment
1	Homework & team work & Oral Discussion	2 <sup>nd</sup>	20	20 %
2	Clinical Exam	15 <sup>th</sup>	30	30 %
3	Final Theoretical Exam & OSCE	16 <sup>th</sup>	50	50 %
Total			100	100%

## IX. Learning Resources:

### 1- Required Textbook(s):

- 3- Lee Alexander Grant, Nyree Griffin (2019). Grainger & Allison's Diagnostic Radiology. Essentials. 2nd edition. United State of America: Elsevier.
- 4- Pellegrino, S., & Mansi, L. Andrea Rockall, Andrew Hatrick, Peter Armstrong, Martin Wastie (Eds.) (2014).: **Diagnostic Imaging (7th edn.)**. UK John Wiley & Sons, Chichester,

### 2- Essential References:

- 5- Dag Wormanns (2020). Diagnostic Imaging of the Chest. 1st edition. United State of America: Thieme Publishing Group.
- 6- Alberto Signore, Ana María Quintero (2013). Diagnostic Imaging of Infections and Inflammatory Diseases: A Multidisciplinary. 1st edition. United State of America: John Wiley & Sons.
- 7- Herring, W. (2007). **Learning radiology: Recognizing the basics. 5<sup>th</sup> edition** Elsevier Health Sciences.
- 8- Jacob Mandell (2013). Core Radiology: A Visual Approach to Diagnostic Imaging. 1st edition. UK: Cambridge University Press.

### 3- Electronic Materials and Web Sites etc.:

#### Websites:

- 1- Radiopaedia  
<https://radiopaedia.org/>
- 2- Learning radiology  
<http://www.learningradiology.com/>
- Radiopaedia  
<https://radiopaedia.org/articles/radiographics>
- Radiology assistant

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<https://radiologyassistant.nl/>

- RadioGraphics - RSNA Journals  
<https://pubs.rsna.org/journal/radiographics>
- AJR Radiology  
<https://www.ajronline.org/>

## XI. Course Policies: (Based on the Uniform Students' Bylaw (2007))

1	<b>Class Attendance:</b> Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	<b>Tardiness:</b> A student will be considered late if he/she is not in class after 10 minutes of the start time of class.
3	<b>Exam Attendance/Punctuality:</b> No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	<b>Assignments &amp; Projects:</b> Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	<b>Cheating:</b> Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	<b>Forgery and Impersonation:</b> Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	<b>Other policies:</b> The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration.

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