



Academic Program Description Form

University Name: Gilgamesh University

Faculty/Institute: College of Health and Medical Technologies

Scientific Department: Radiology and Sonar Technologies

Academic or Professional Program Name: Bachelor in Radiologic Technology

Final Certificate Name:

Academic System: Credit -hour system

Description Preparation Date:

File Completion Date:

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

Excellence in the field of legal sciences through teaching, development, and research, with contributions to enriching specializations and preparing qualified professionals capable of making meaningful additions across various legal disciplines

2. Program Mission

Program mission is written here as stated in the university's catalogue and website.

3. Program Objectives

"To develop highly skilled professionals with outstanding knowledge and research capabilities in various fields of legal sciences, capable of competing in the labor market; to advance legal knowledge, serve the community, and address the shortage in legal professions and specializations at both regional and global levels; in addition to opening horizons for scientific research and postgraduate studies, and contributing to the enrichment of legal knowledge."

4. Program Accreditation

Graduates of the Radiology and Sonar Department should be well-versed in all information related to the field of medical and radiological imaging, as well as in handling various medical cases and providing appropriate patient care."

5. Other external influences

Is there a sponsor for the program?

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements				
College Requirements				
Department Requirements				
Summer Training				
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours
1st - 1		skeleton of Anatomy	3
1st - 1		General physics	3
1st - 1		physiology General	3
1st - 1		Biology	3
1st - 1		General chemistry	3
1st - 1		1 principles Computer	2
1st - 1		democracy and rights Human	1

1st - 1		English language	3
1st - 2		Anatomy of body systems	3
1st - 2		Physics of atom	2
1st - 2		Systemic Physiology	2
1st - 2		Radiobiology	2
1st - 2		Principles of Nursing	2
1st - 2		Computer Principles 2	2
1st - 2		Medical Terminology	2
1st - 2		Arabic Language	2
1st - 2		جرائم حزب البعث البائد	1
2nd - 1		Conventional Radiological Equipment Techniques	4
2nd - 1		Radiographic Techniques for Upper limbs	4
2nd - 1		Special Radiological procedures of gastrointestinal tract and bones	4
2nd - 1		Radiological anatomy of head and upper Limbs	4
2nd - 1		Fundamentals of Radio - Physics	3
2nd - 1		Fundamentals of Radiation Protection	3

2nd - 2		Computed Tomography Equipment Techniques	4
2nd - 2		Radiographic Techniques for Lower Limbs	4
2nd - 2		Special Radiological Procedures of biliary and reproductive system	4
2nd - 2		Radiological anatomy of Lower Limbs	4
2nd - 2		Physics of Computed Tomography	3
3rd - 1		Equipment techniques of magnetic resonance imaging	4
3rd - 1		Radiographic techniques for head and spinal cord	4
3rd - 1		Special radiological procedures of the head, breast and respiratory system	4
3rd - 1		Radiological anatomy of brain and spinal column	3
3rd - 1		General Pathology	3
3rd - 1		Physics of Magnetic Resonance	2
3rd - 1		Biological Radiation Hazards	3

3rd - 1		Computer Applications 1	2
3rd - 2		Ultrasound Equipment Techniques	4
3rd - 2		Radiographic Techniques of Thorax and Abdomen	4
3rd - 2		Special radiological procedures of the cardiovascular and central nervous system	4
3rd - 2		Radiological Anatomy of Thorax and Abdomen	3
3rd - 2		Systemic Pathology	3
3rd - 2		Physics of Ultrasound	2
3rd - 2		Computer Applications 2	2
4th - 1		Computed tomography imaging of head and spinal cord	4
4th - 1		Magnetic resonance imaging principles and head exam	4
4th - 1		Abdominal Ultrasound Imaging	4
4th - 1		Medicine of Internal Diseases	3
4th - 1		Biostatistics and Computer Applications	4

4th - 2		Computed tomography imaging of chest, abdomen and pelvis	4
4th - 2		Magnetic resonance imaging of musculoskeletal system, abdomen and pelvis	4
4th - 2		Obstetrics and gynecologic imaging ultrasound	4
4th - 2		Medicine of Surgical Diseases	3
4th - 2		Professional Ethics	2
4th - 2		Graduation Project	4

8. Expected learning outcomes of the program
Knowledge
Skills
•
Ethics
<ul style="list-style-type: none"> • Demonstrate a strong commitment to justice, fairness, and the rule of law in both personal and professional conduct. • Uphold the highest standards of professional ethics, including honesty, confidentiality, accountability, and respect for legal procedures. • Recognize and address ethical dilemmas in legal practice with integrity and critical judgment. • Show respect for human rights, dignity, and diversity, and advocate for social justice and equality before the law.

- Promote a culture of **transparency and responsibility** in legal institutions and public service.
- Commit to **continuous ethical reflection and learning**, in response to evolving legal and societal challenges.

9. Teaching and Learning Strategies

- **Brainstorming Strategy**
- **Group Work Strategy**
- **Discussion Strategy**
- **Case Study Strategy**
- **Inductive Teaching Strategy**
- **Concept Mapping Strategy**
- **Self-Learning Strategy**
- **E-Learning Strategy**
- **Study Strategy**
- **Inference Strategy**
- **Spaced Practice Strategy**
- **Interleaving Strategy**
- **Using Examples Strategy**

10. Evaluation methods

- a. Daily quizzes
- b. Midterm exams
- c. Weekly reports
- d. Daily attendance and participation
- e. Practical exams in hospitals
- f. Graduation research project

11. Faculty						
Faculty Members						
Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Lecturer						
Assistant Lecturer						

Professional Development
Mentoring new faculty members
Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.
Professional development of faculty members
Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
1st - 1		skeleton of Anatomy	Basic	*	*	*	*	*	*	*	*	*	*	*	
1st - 1		General physics	Basic	*	*	*	*	*	*	*	*	*	*	*	
1st - 1		physiology General	Basic	*	*	*	*	*	*	*	*	*	*	*	
1st - 1		Biology	Basic	*	*	*	*	*	*	*	*	*	*	*	
1st - 1		General chemistry	Basic	*	*	*	*	*	*	*	*	*	*	*	

1st - 1		1 principles Computer	Basic	*	*	*	*	*	*	*	*	*	*	*	*
1st - 1		democracy and rights Human	Basic	*	*	*	*	*	*	*	*	*	*	*	*
1st - 1		English language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
1st - 2		Anatomy of body systems	Basic	*	*	*	*	*	*	*	*	*	*	*	*
1st - 2		Physics of atom	Basic	*	*	*	*	*	*	*	*	*	*	*	*
1st - 2		Systemic Physiology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
1st - 2		Radiobiology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
1st - 2		Principles of Nursing	Basic	*	*	*	*	*	*	*	*	*	*	*	*

1st - 2		Computer Principles 2	Basic	*	*	*	*	*	*	*	*	*	*	*	*
1st - 2		Medical Terminology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
1st - 2		Arabic Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
1st - 2		جرائم حزب البعث البائد	Basic	*	*	*	*	*	*	*	*	*	*	*	*
2nd - 1		Conventional Radiological Equipment Techniques	Basic	*	*	*	*	*	*	*	*	*	*	*	*
2nd - 1		Radiographic Techniques for Upper limbs	Basic	*	*	*	*	*	*	*	*	*	*	*	*
2nd - 1		Special Radiological procedures of	Basic	*	*	*	*	*	*	*	*	*	*	*	*

		gastrointestinal tract and bones													
2nd - 1		Radiological anatomy of head and upper Limbs	Basic	*	*	*	*	*	*	*	*	*	*	*	*
2nd - 1		Fundamentals of Radio - Physics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
2nd - 1		Fundamentals of Radiation Protection	Basic	*	*	*	*	*	*	*	*	*	*	*	*
2nd - 2		Computed Tomography Equipment Techniques	Basic	*	*	*	*	*	*	*	*	*	*	*	*

2nd - 2		Radiographic Techniques for Lower Limbs	Basic	*	*	*	*	*	*	*	*	*	*	*	*
2nd - 2		Special Radiological Procedures of biliary and reproductive system	Basic	*	*	*	*	*	*	*	*	*	*	*	*
2nd - 2		Radiological anatomy of Lower Limbs	Basic	*	*	*	*	*	*	*	*	*	*	*	*
2nd - 2		Physics of Computed Tomography	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 1		Equipment techniques of	Basic	*	*	*	*	*	*	*	*	*	*	*	*

		magnetic resonance imaging													
3rd - 1		Radiographic techniques for head and spinal cord	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 1		Special radiological procedures of the head, breast and respiratory system	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 1		Radiological anatomy of brain and spinal column	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 1		General Pathology	Basic	*	*	*	*	*	*	*	*	*	*	*	*

3rd - 1		Physics of Magnetic Resonance	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 1		Biological Radiation Hazards	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 1		Computer Applications 1	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 2		Ultrasound Equipment Techniques	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 2		Radiographic Techniques of Thorax and Abdomen	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 2		Special radiological procedures of the cardiovascular and	Basic	*	*	*	*	*	*	*	*	*	*	*	*

		central nervous system													
3rd - 2		Radiological Anatomy of Thorax and Abdomen	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 2		Systemic Pathology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 2		Physics of Ultrasound	Basic	*	*	*	*	*	*	*	*	*	*	*	*
3rd - 2		Computer Applications 2	Basic	*	*	*	*	*	*	*	*	*	*	*	*
4th - 1		Computed tomography imaging of head and spinal cord	Basic	*	*	*	*	*	*	*	*	*	*	*	*

4th - 1		Magnetic resonance imaging principles and head exam	Basic	*	*	*	*	*	*	*	*	*	*	*	*
4th - 1		Abdominal Ultrasound Imaging	Basic	*	*	*	*	*	*	*	*	*	*	*	*
4th - 1		Medicine of Internal Diseases	Basic	*	*	*	*	*	*	*	*	*	*	*	*
4th - 1		Biostatistics and Computer Applications	Basic	*	*	*	*	*	*	*	*	*	*	*	*
4th - 2		Computed tomography imaging of chest, abdomen and pelvis	Basic	*	*	*	*	*	*	*	*	*	*	*	*

4th - 2		Magnetic resonance imaging of musculoskeletal system, abdomen and pelvis	Basic	*	*	*	*	*	*	*	*	*	*	*	*
4th - 2		Obstetrics and gynecologic imaging ultrasound	Basic	*	*	*	*	*	*	*	*	*	*	*	*
4th - 2		Medicine of Surgical Diseases	Basic	*	*	*	*	*	*	*	*	*	*	*	*
4th - 2		Professional Ethics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
4th - 2		Graduation Project	Basic	*	*	*	*	*	*	*	*	*	*	*	*

- Please tick the boxes corresponding to the individual program learning outcomes under evalu

Course Description Form

1. Course Name:	
Computer Fundamentals (1)	
2. Course Code:	
RAD 203	
3. Semester / Year:	
Semester1/2024-2025	
4. Description Preparation Date:	
7/7/2025	
5. Available Attendance Forms:	
Theory/weekly	
6. Number of Credit Hours (Total) / Number of Units (Total)	
Experimental 3/Theoretical 2	
7. Course administrator's name (mention all, if more than one name)	
Name: MSC.Thalfaa Rasheed Ajeel Email: Thalfaa. Rasheed @ gau.edu.iq	
8. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • It consists of diagnosing and understanding the mechanics and configuration of the device • The ability to use, examine and diagnose.....
9. Teaching and Learning Strategies	
Strategy	<p>A- Cognitive objectives:</p> <ul style="list-style-type: none"> --1 The student can understand the basic components of the device -2 The student can distinguish and diagnose the healthy and injured condition of the organ being examined 3-The student can explain the mechanism of the resulting image 4-The student can understand and write a report on this

B - Skills objectives for the course:

B1 - The student can solve problems related to the device

B2 - The student can write the medical report

B3 - The student can solve problems related to the organs inside the human body

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	<p>Operating systems OS's:</p> <p>(what is an OS's and what it can do, types of OS's their features importance) , Windows OS's</p> <p>(95,97,2000,Me,Xp,Vista,7,8,8.1 and 10) and their characteristics; Explain the differences between</p> <p>OS's and software application ; computer power On/Off, using mouse and their buttons.</p>	<p>Operating systems OS's:</p> <p>(what is an OS's and what it can do, types of OS's their features importance) , Windows OS's</p> <p>(95,97,2000,Me,Xp,Vista,7,8,8.1 and 10) and their characteristics; Explain the differences between</p> <p>OS's and software application ; computer power On/Off, using mouse and their buttons.</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
2&3	2	<p>Looking at the desktop:</p> <p>Navigation around desktop; using start button; working with application ; using taskbar ;</p> <p>understanding software and hardware (their differences, importance and relationships) ; explain how</p> <p>hardware can influence the OS and software and Vice Versa; software updates, security and bugs;</p> <p>software ethics.</p> <p>3</p> <p>Files & folders:</p> <p>looking at typical window; moving and sizing window;</p>	<p>Looking at the desktop:</p> <p>Navigation around desktop; using start button; working with application ; using taskbar ;</p> <p>understanding software and hardware (their differences, importance and relationships) ; explain how</p> <p>hardware can influence the OS and software and Vice Versa; software updates, security and bugs;</p> <p>software ethics.</p> <p>3</p> <p>Files & folders:</p> <p>looking at typical window; moving and sizing window;</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

		<p>using scroll bars; understanding and using my</p> <p>computer and recycle bin ; concepts of drives, folders and files (differences and importance);</p> <p>directory and folder hierarchy and importance); directory and folder hierarchy and structure</p> <p>;understanding filename and common extensions.</p>	<p>using scroll bars; understanding and using my</p> <p>computer and recycle bin ; concepts of drives, folders and files (differences and importance);</p> <p>directory and folder hierarchy and importance); directory and folder hierarchy and structure</p> <p>;understanding filename and common extensions</p>		
4&5	2	<p>Folder And Files Managements:</p> <p>(Create, Copy, Cut, Delete, Rename, Find and Move); Common Keyboard Shortcuts; Undelete folder</p> <p>and files using Recycle Bin; Display the differences between Uninstall and Undelete or Delete.</p> <p>5</p> <p>Computer Hardware:</p> <p>Identifying Computers (Main Frame; Super Computers; Mini computers; Desktop; Notebooks;</p> <p>Laptop; Tablet PCs; Servers; Hand-held or Mobile computers; Music or Media players and Electronic Book readers).</p>	<p>Folder And Files Managements:</p> <p>(Create, Copy, Cut, Delete, Rename, Find and Move); Common Keyboard Shortcuts; Undelete folder</p> <p>and files using Recycle Bin; Display the differences between Uninstall and Undelete or Delete.</p> <p>5</p> <p>Computer Hardware:</p> <p>Identifying Computers (Main Frame; Super Computers; Mini computers; Desktop; Notebooks;</p> <p>Laptop; Tablet PCs; Servers; Hand-held or Mobile computers; Music or Media players and Electronic Book readers).</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
6	2	<p>Using Control Panel:</p> <p>Customizing Desktop and Display; Changing Date and Time; Changing Language; Accessibility</p> <p>Settings.</p>	<p>Using Control Panel:</p> <p>Customizing Desktop and Display; Changing Date and Time; Changing Language; Accessibility</p> <p>Settings.</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
7&8	2	<p>Looking Inside a Computer:</p> <p>(Microprocessor , System memory , Storage systems);</p>	<p>Looking Inside a Computer:</p> <p>(Microprocessor , System memory , Storage systems);</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam

		<p>Recognizing Input /Output Devices (using</p> <p>Keyboard; Pointing devices; Microphones; Monitor; Printers; Projector and Speakers); Understanding</p> <p>How it works together.Understanding Power Options:</p> <p>(Shut down, Sleep, Hibernate); Working with Power settings; Identifying mode of operation (Safe</p> <p>Mode and Normal Mode); Understanding User Accounts and Rights (Create New User Account;</p> <p>Changing Controls; Rights and Access).</p>	<p>Recognizing Input /Output Devices (using</p> <p>Keyboard; Pointing devices; Microphones; Monitor; Printers; Projector and Speakers); Understanding</p> <p>How it works together.Understanding Power Options:</p> <p>(Shut down, Sleep, Hibernate); Working with Power settings; Identifying mode of operation (Safe</p> <p>Mode and Normal Mode); Understanding User Accounts and Rights (Create New User Account;</p> <p>Changing Controls; Rights and Access).</p>		<ul style="list-style-type: none"> • Final exam
9	2	<p>What is a Software:</p> <p>(Checking System Requirements & Hardware Implications)</p>	<p>What is a Software:</p> <p>(Checking System Requirements & Hardware Implications)</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
10	2	<p>Disk Management Programs:</p> <p>(Disk Clean-up, Check, Optimize and compression); What is Troubleshooting? ; Managing</p> <p>Hardware / Software; Keep Copies of data; Dealing with Viruses, Malware and Trojans; Getting windows help and support.</p>	<p>Disk Management Programs:</p> <p>(Disk Clean-up, Check, Optimize and compression); What is Troubleshooting? ; Managing</p> <p>Hardware / Software; Keep Copies of data; Dealing with Viruses, Malware and Trojans; Getting windows help and support.</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
11	2	The Internet, Browsers and the World Wide Web	The Internet, Browsers and the World Wide Web	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
12	2	(The Internet, The World Wide Web, Web Browsers); Understanding Web Site Addresses (Web Site	(The Internet, The World Wide Web, Web Browsers); Understanding Web Site Addresses (Web Site	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

13	2	Protocols, Resource Names).	Protocols, Resource Names).	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
14	2	Protocols, Resource Names).	Protocols, Resource Names).	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
15	2	Common Web Site/Page Elements; Browser Features and Functions (Browser Functions, Browser	Common Web Site/Page Elements; Browser Features and Functions (Browser Functions, Browser	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

11. Course Evaluation

– The exam is based on the CUSE system and semester exams

- Preparing brief reports for a student and presenting them in the form of a seminar, activity and participation within the lecture

Distribution of the score out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<p>Text Books:</p> <p>د. زياد هود عبد وأخروي، بأشراف م.اساسيات الحاسب وحطيقاهه الوكخبيت ، أ 1-اللجنت النزاريات الخاصت بخطير</p> <p>ههاراث الطلبت في هادة الحاسب ، وزارة الخطين العالي والبعث العلوي ، دائرة البعث 1. ، 4112والخطير ، ج</p> <p>د غساي حويذ عبد . (أ) اساسيات التخزينج (اساسيات الحاسب وحطيقاهه الوكخبيت 2-اللجنت :الوجيذ وأخروي، بأشراف</p> <p>النزاريات الخاصت بخطير ههاراث الطلبت في هادة الحاسب ، وزارة الخطين العالي والبعث العلوي ، دائرة البعث</p> <p>ج ، 4112والخطير ، References: 2</p> <p>Book link (http://amazon.com/internet-computing)</p> <p>Introductory Guide”, Springer, (1973).</p> <p>3. D.R. Dance, S. Christofides, A.D.A. Maidment, I.D. McLean K.H. Ng “Diagnostic Radiology Physics”, International atomic energy agency, Vienna,(2014).</p>
Main references (sources)	<p>.Text Books:</p> <p>د. زياد هود عبد وأخروي، بأشراف م.اساسيات الحاسب وحطيقاهه الوكخبيت ، أ 1-اللجنت النزاريات الخاصت بخطير</p> <p>ههاراث الطلبت في هادة الحاسب ، وزارة الخطين العالي والبعث العلوي ، دائرة البعث 1. ، 4112والخطير ، ج</p>

	<p>د غسای حویذ عبذ ، أ) اساسيات النخرنيج (اساسيات الحاسب و حطيقاقه الوكخبيت 2-اللجنت :الوجيذ وأخروي، بأشراف</p> <p>النزاريت الخاصة بختبير ههاراث الطلبيت في هادة الحاسب ، وزارة الخعلين العالي والبحث العلوي ، دائرة البحث</p> <p>ج .References: 2 4112والخطبير ، ج</p> <p>Book link (http://amazon.com/internet-computing)</p>
Recommended books and references (scientific journals, reports...)	Internet
Electronic References, Websites	Websites of magazines classified within Scopus, internet publishing houses, and international universities

Weeks	Details
1	<p>Display OS's basic on shutdown computer, log on, restart, sleep, using mouse (pointing, selecting, dragging and executing).</p>
2 & 3	<p>Using desktop, moving around the desktop and using the main application icons, using the start button, open, close and uninstall.</p> <p>3</p> <p>Looking at window details (title bar, tools bar, address bar, status bar and windows' content), expand and collapse and close window, moving and resizing window</p>
4 & 5	<p>Work with drive, folders and files using the listed operation, using common shortcuts (Ctrl + C, +V, +A, +S ... etc.), restore folder or files.</p> <p>5</p> <p>Identify the h</p>
6	<p>Explain microprocessor chip, types of memory (RAM, ROM and SSD Drive), memory units of measurements, storage devices, how to use keyboard, mouse, printers and other peripherals,</p>

	identifying motherboard and their ports, how to use computer resources.
7 & 8	Identifying the control panel icon, changing desktop icon, wallpaper, display type and size, setup time and date, using language options, using accessibility. 8 Power off computer using different options, understanding the mode of operation, create user account, log off, log in, changing account
9	Understanding the application software, type and their usage, how install and uninstall programs and display their difference from delete, update or reinstall the software
10	Delete systematically unnecessary files, scan disk, understand the most common troubleshooting of computer or software, copy files or disk, using antiviruses, getting help for windows, getting online help.
11	Exercise of checking connection of your computer system to the internet, and use a simple utility (ping request) to test whether your internet connection is functioning or not, open web sites of different domains (.net, .org, .com, .edu).
12	Open different web browsers (internet explorer, Firefox, chrome and others explain their function (addressing, uploading and downloading, and searching) and features (back, forward, and refresh buttons, home page, Tabs, favorites \ bookmarks, checking the history, plug-ins\add-ons), connect to the internet, identifying networks and their types
13	Security (Password, Password recovery information, and alternative e-mail), sending e-mail (To, CC, BCC, and subject), attaching file to e-mail, building contacts list and others. Sending E-mail using outlook (with exploring all properties above).

14	<p>Protecting Your Data or Computer (Identifying Software Threats, Understanding Viruses), Protecting Yourself While Online; Buying Online; How Much Information Should I Share?, Protecting Your Privacy).</p>
15	<p>Narrowing the Search; Evaluating the Information (Reliability and Relevance; Validity and Authenticity; Objectivity and Bias).</p> <p>Try to make password, try to remove files without recoverable ability (ex: flickr.com, youtube.com).</p> <p>Try web search for certain key words using different search engine (ex: Google, Bing) also search multimedia files (Pictures, audio or video) in specialized search engine (ex: Fliker.com, youtube.com).</p> <p>Find specific and accurate information using Google (reduce no. of keywords, use quotation marks, use OR, search within certain site, and others).</p>

Course Description Form

13. Course Name:	
Computer Fundamentals2	
14. Course Code:	
RAD 204	
15. Semester / Year:	
Semester1/2024-2025	
16. Description Preparation Date:	
7/7/2025	
17. Available Attendance Forms:	
Theory/weekly	
18. Number of Credit Hours (Total) / Number of Units (Total)	
Experimental 3/Theoretical 2	
19. Course administrator's name (mention all, if more than one name)	
Name: MSC.Thalfaa Rasheed Ajeel Email: Thalfaa. Rasheed @ gau.edu.iq	
20. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • It consists of diagnosing and understanding the mechanics and configuration of the device • The ability to use, examine and diagnose.....
21. Teaching and Learning Strategies	
Strategy	<p>A- Cognitive objectives:</p> <p>--1 The student can understand the basic components of the device</p> <p>--2 The student can distinguish and diagnose the healthy and injured condition of the organ being examined</p>

	<p>3-The student can explain the mechanism of the resulting image</p> <p>4-The student can understand and write a report on this</p> <p>B - Skills objectives for the course:</p> <p>B1 - The student can solve problems related to the device</p> <p>B2 - The student can write the medical report</p> <p>B3 - The student can solve problems related to the organs inside the human body</p>
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22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	<p>Operating systems OS's:</p> <p>(what is an OS's and what it can do, types of OS's their features importance) , Windows OS's</p> <p>(95,97,2000,Me,Xp,Vista,7,8,8.1 and 10) and their characteristics; Explain the differences between</p> <p>OS's and software application ; computer power On/Off, using mouse and their buttons.</p>	<p>Operating systems OS's:</p> <p>(what is an OS's and what it can do, types of OS's their features importance) , Windows OS's</p> <p>(95,97,2000,Me,Xp,Vista,7,8,8.1 and 10) and their characteristics; Explain the differences between</p> <p>OS's and software application ; computer power On/Off, using mouse and their buttons.</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
2&3	2	<p>Looking at the desktop:</p> <p>Navigation around desktop; using start button; working with application ; using taskbar ;</p> <p>understanding software and hardware (their differences, importance and relationships) ; explain how</p> <p>hardware can influence the OS and software and Vice Versa; software updates, security and bugs;</p> <p>software ethics.</p> <p>3</p>	<p>Looking at the desktop:</p> <p>Navigation around desktop; using start button; working with application ; using taskbar ;</p> <p>understanding software and hardware (their differences, importance and relationships) ; explain how</p> <p>hardware can influence the OS and software and Vice Versa; software updates, security and bugs;</p> <p>software ethics.</p> <p>3</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

		<p>Files & folders:</p> <p>looking at typical window; moving and sizing window; using scroll bars; understanding and using my</p> <p>computer and recycle bin ; concepts of drives, folders and files (differences and importance);</p> <p>directory and folder hierarchy and importance); directory and folder hierarchy and structure</p> <p>;understanding filename and common extensions.</p>	<p>Files & folders:</p> <p>looking at typical window; moving and sizing window; using scroll bars; understanding and using my</p> <p>computer and recycle bin ; concepts of drives, folders and files (differences and importance);</p> <p>directory and folder hierarchy and importance); directory and folder hierarchy and structure</p> <p>;understanding filename and common extensions</p>		
4&5	2	<p>Folder And Files Managements:</p> <p>(Create, Copy, Cut, Delete, Rename, Find and Move); Common Keyboard Shortcuts; Undelete folder</p> <p>and files using Recycle Bin; Display the differences between Uninstall and Undelete or Delete.</p> <p>5</p> <p>Computer Hardware:</p> <p>Identifying Computers (Main Frame; Super Computers; Mini computers; Desktop; Notebooks;</p> <p>Laptop; Tablet PCs; Servers; Hand-held or Mobile computers; Music or Media players and Electronic Book readers).</p>	<p>Folder And Files Managements:</p> <p>(Create, Copy, Cut, Delete, Rename, Find and Move); Common Keyboard Shortcuts; Undelete folder</p> <p>and files using Recycle Bin; Display the differences between Uninstall and Undelete or Delete.</p> <p>5</p> <p>Computer Hardware:</p> <p>Identifying Computers (Main Frame; Super Computers; Mini computers; Desktop; Notebooks;</p> <p>Laptop; Tablet PCs; Servers; Hand-held or Mobile computers; Music or Media players and Electronic Book readers).</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
6	2	<p>Using Control Panel:</p> <p>Customizing Desktop and Display; Changing Date and Time; Changing Language; Accessibility</p> <p>Settings.</p>	<p>Using Control Panel:</p> <p>Customizing Desktop and Display; Changing Date and Time; Changing Language; Accessibility</p> <p>Settings.</p>	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

7&8	2	<p>Looking Inside a Computer:</p> <p>(Microprocessor , System memory , Storage systems); Recognizing Input /Output Devices (using Keyboard; Pointing devices; Microphones; Monitor; Printers; Projector and Speakers); Understanding How it works together.Understanding Power Options:</p> <p>(Shut down, Sleep, Hibernate); Working with Power settings; Identifying mode of operation (Safe Mode and Normal Mode); Understanding User Accounts and Rights (Create New User Account;</p> <p>Changing Controls; Rights and Access).</p>	<p>Looking Inside a Computer:</p> <p>(Microprocessor , System memory , Storage systems); Recognizing Input /Output Devices (using Keyboard; Pointing devices; Microphones; Monitor; Printers; Projector and Speakers); Understanding How it works together.Understanding Power Options:</p> <p>(Shut down, Sleep, Hibernate); Working with Power settings; Identifying mode of operation (Safe Mode and Normal Mode); Understanding User Accounts and Rights (Create New User Account;</p> <p>Changing Controls; Rights and Access).</p>	<p>in person education lectures using data sheets (PowerPoint) software</p>	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
9	2	<p>What is a Software:</p> <p>(Checking System Requirements & Hardware Implications)</p>	<p>What is a Software:</p> <p>(Checking System Requirements & Hardware Implications)</p>	<p>in person education lectures using data sheets (PowerPoint) software</p>	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
10	2	<p>Disk Management Programs:</p> <p>(Disk Clean-up, Check, Optimize and compression); What is Troubleshooting? ; Managing Hardware / Software; Keep Copies of data; Dealing with Viruses, Malware and Trojans; Getting windows help and support.</p>	<p>Disk Management Programs:</p> <p>(Disk Clean-up, Check, Optimize and compression); What is Troubleshooting? ; Managing Hardware / Software; Keep Copies of data; Dealing with Viruses, Malware and Trojans; Getting windows help and support.</p>	<p>in person education lectures using data sheets (PowerPoint) software</p>	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
11	2	<p>The Internet, Browsers and the World Wide Web</p>	<p>The Internet, Browsers and the World Wide Web</p>	<p>in person education lectures using data sheets (PowerPoint) software</p>	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

12	2	(The Internet, The World Wide Web, Web Browsers); Understanding Web Site Addresses (Web Site	(The Internet, The World Wide Web, Web Browsers); Understanding Web Site Addresses (Web Site	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
13	2	Protocols, Resource Names).	Protocols, Resource Names).	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
14	2	Protocols, Resource Names).	Protocols, Resource Names).	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
15	2	Common Web Site/Page Elements; Browser Features and Functions (Browser Functions, Browser	Common Web Site/Page Elements; Browser Features and Functions (Browser Functions, Browser	in person education lectures using data sheets (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

23. Course Evaluation

- The exam is based on the CUSE system and semester exams

- Preparing brief reports for a student and presenting them in the form of a seminar, activity and participation within the lecture

Distribution of the score out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Text Books:

د زياد هوذ عبيد وآخروي، بأشراف م.اساسيات الحاسب وحطيقاهه الوكخيبت ، أ
1-اللجنت النزاريات الخاصت بخطبير

ههاراث الطلبيت في هادة الحاسب ، وزارة الخغلين العالي والبعث العلوي ، دائرة البعث
ج ، 1. ، 4112والخطبير ،

د غساي حويذ عبيد . أ)اساسيات التخزينج (اساسيات الحاسب وحطيقاهه الوكخيبت
2-اللجنت :الوجيذ وآخروي، بأشراف

النزاريات الخاصت بخطبير ههاراث الطلبيت في هادة الحاسب ، وزارة الخغلين العالي
والبعث العلوي ، دائرة البعث

References: 2. ، 4112والخطبير ، ج

Book link (<http://amazon.com/internet-computing>)

Introductory Guide”, Springer, (1973).

3. D.R. Dance, S. Christofides, A.D.A. Maidment, I.D. McLearn
K.H. Ng “Diagnostic Radiology Physics”, International atomic
energy agency, Vienna,(2014).

Main references (sources)

.Text Books:

	<p>د. زياد همود عبيد وأخروي، بأشراف م.اساسيات الحاسب وحطيقاقه الوكخبيت ، أ 1-اللجنت النزاريث الخاصت بختبير</p> <p>ههاراث الطلبيت في هادة الحاسب ، وزارة الخعلين العالي والبعث العلوي ، دائرة البعث ج 1. ،4112والختبير ، ج</p> <p>د غساي حويذ عبذ . أ)اساسيات التخرنيج (اساسيات الحاسب وحطيقاقه الوكخبيت 2-اللجنت :الوجيذ وأخروي، بأشراف</p> <p>النزاريث الخاصت بختبير ههاراث الطلبيت في هادة الحاسب ، وزارة الخعلين العالي والبعث العلوي ، دائرة البعث</p> <p>ج .References: 2. 4112والختبير ، ج</p> <p>Book link (http://amazon.com/internet-computing)</p>
Recommended books and references (scientific journals, reports...)	Internet
Electronic References, Websites	Websites of magazines classified within Scopus, internet publishing houses, and international universities

Weeks	Details
1	<p>Display OS's basic on shutdown computer, log on, restart, sleep, using mouse (pointing, selecting, dragging and executing).</p>
2 & 3	<p>Using desktop, moving around the desktop and using the main application icons, using the start button, open, close and uninstall.</p> <p>3</p> <p>Looking at window details (title bar, tools bar, address bar, status bar and windows' content), expand and collapse and close window, moving and resizing window</p>
4 & 5	<p>Work with drive, folders and files using the listed operation, using common shortcuts (Ctrl + C, +V, +A, +S ... etc.), restore folder or files.</p> <p>5</p> <p>Identify the h</p>

6	<p>Explain microprocessor chip, types of memory (RAM, ROM and SSD Drive), memory units of measurements, storage devices, how to use keyboard, mouse, printers and other peripherals,</p> <p>identifying motherboard and their ports, how to use computer recourses.</p>
7 & 8	<p>Identifying the control panel icon, changing desktop icon, wallpaper, display type and size, setup time</p> <p>and date, using language options, using accessibility.</p> <p>8</p> <p>Power off computer using different options, understanding the mode of operation, create user account, log off, log in, changing account</p>
9	<p>Understanding the application software, type and their usage, how install and uninstall programs and</p> <p>display their difference from delete, update or reinstall the software</p>
10	<p>Delete systematically unnecessary files, scan disk, understand the most common troubleshooting of</p> <p>computer or software, copy files or disk, using antiviruses, getting help for windows, getting online</p> <p>help.</p>
11	<p>Exercise of checking connection of your computer system to the internet, and use a simple utility</p> <p>(ping request) to test whether your internet connection is functioning or not, open web sites of</p> <p>different domains. (.net, .org, .com, .edu).</p>
12	<p>Open different web browsers (internet explorer, Firefox, chrome and others explain their function</p> <p>(addressing, uploading and downloading, and searching) and features (back, forward, and refresh</p> <p>buttons, home page, Tabs, favorites \ bookmarks, checking the history, plug-ins\add-ons), connect to</p> <p>the internet, identifying networks and their types</p>

13	<p>Security (Password, Password recovery information, and alternative e-mail), sending e-mail (To, CC, BCC, and subject), attaching file to e-mail, building contacts list and others.</p> <p>Sending E-mail using outlook (with exploring all properties above).</p>
14	<p>Protecting Your Data or Computer (Identifying Software Threats, Understanding Viruses), Protecting Yourself While Online; Buying Online; How Much Information Should I Share?, Protecting Your Privacy).</p>
15	<p>Narrowing the Search; Evaluating the Information (Reliability and Relevance; Validity and Authenticity; Objectivity and Bias).</p> <p>Try to make password, try to remove files without recoverable ability (ex: flickr.com, youtube.com).</p> <p>Try web search for certain key words using different search engine (ex: Google, Bing) also search multimedia files (Pictures, audio or video) in specialized search engine (ex: Fliker.com, youtube.com).</p> <p>Find specific and accurate information using Google (reduce no. of keywords, use quotation marks, use OR, search within certain site, and others).</p>

Course Description Form

25.	Course Name:	
	English	
26.	Course Code:	
	MTU 102	
27.	Semester / Year:	
	2024–2025 First Semester	
28.	Description Preparation Date:	
	11/7/2025	
29.	Available Attendance Forms:	
30.	Number of Credit Hours (Total) / Number of Units (Total)	
	2 hours	
31.	Course administrator's name (mention all, if more than one name)	
	Name: Zahraa Jaber Abdul Kadhim	
	Email:	
32.	Course Objectives	
	Course Objectives By the end of the course, students	The subject-specific skills developed through the course "New Headway Plus - Pre-

<p>will have a solid foundation of knowledge and understanding in ,English language structure ,vocabulary, listening, reading speaking, writing, cultural awareness, and study skills. These competencies will enable them to communicate effectively in English and continue .their language learning journey</p>	<p>intermediate Level" include:</p> <p>Language Proficiency: Students will develop the ability to use English effectively and accurately in various contexts. They will acquire subject-specific skills in listening, speaking, reading, and writing, enabling them to communicate fluently and appropriately.</p> <p>Grammar and Syntax: Students will gain proficiency in using grammatical structures and syntax of the English language. They will develop subject-specific skills in understanding and applying grammar rules</p>
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33. Teaching and Learning Strategies

<p>:Task-based Learning</p>	<p>This approach emphasizes real-world communication and problem-solving. Students are presented with tasks that require them to use the language functionally, such as planning a trip, ordering food, or discussing a news article</p>
<p>2. :Four-skills approach</p>	<p>The course focuses on developing all four language skills: listening</p>

<p>3. Communicative approach</p>	<p>speaking, reading, and writing. Each unit includes activities and exercises that target each skill individually and in an integrated way</p> <p>The emphasis is on using language for communication, not just memorizing grammar rules. Students are encouraged to use the language they are learning to interact with others and express themselves</p>
<p>4. Scaffolding</p>	<p>This technique provides students with support as they learn new concepts and skills. Activities are designed to move from controlled practice to freer production, allowing students to gradually develop their abilities</p>
<p>5. Variety of activities</p>	<p>The course book uses a variety of activities to cater to different learning styles and preferences. These include</p> <ul style="list-style-type: none"> ● Dialogues and conversations ● Reading passages and comprehension exercises ● Grammar exercises and activities ● Vocabulary building exercises ● Role-playing activities

<p>6. Technology :integration</p>	<ul style="list-style-type: none"> ● Games and simulations ● Projects <p>The New Headway Plus course offers online resources and activities that can be .used to supplement classroom learning</p> <p>These resources can provide students .with additional practice and opportunities for self-study</p>
<p>7. :Learner autonomy</p>	<p>The course encourages students to become independent learners by providing them with strategies for ,self-monitoring, evaluation and learning. This includes activities such as setting goa ,reflecting on their progress .and identifying areas for improvement</p>
<p>:Differentiation .8</p>	<p>The course can be adapted to meet the needs of diverse learners. Teachers can ,use different teaching methods, materials and assessments to cater to different .learning styles and levels</p>

34. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1		Introduction	Lecture	Quiz & activity +Daily assessment
2	1		The time + present	Lecture	Quiz & activity +Daily assessment
3	1		simple	Lecture	Quiz & activity +Daily assessment
4,5	1		He, she , it Usually / sometimes /never	Lecture	Quiz & activity +Daily assessment
6	1		Question words / it , then	Lecture	Quiz & activity +Daily assessment
7	1		This / that . Adjectives. Can I?	Lecture	Quiz & activity +Daily assessment
8	1		Exam		

9	1	Rooms & furniture. There is/are	Lecture	Quiz & activity +Daily assessment
		Any. Preposition. Directions	Lecture	Quiz & activity +Daily assessment
10	1	Saying years. Was / were/ born	Lecture	Quiz & activity +Daily assessment
11	1	Past simple- irregular verbs	Lecture	Quiz & activity +Daily assessment
12	1	Past simple – regular verbs & irregular verbs	Lecture	Quiz & activity +Daily assessment
13	1	Question & negative	Lecture	Quiz & activity +Daily assessment
14		Exam 2		

35. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ... etc	
36. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

37. Course Name:	
General Anatomy	
38. Course Code:	
HMBA 113	
39. Semester / Year:	
2024–2025	
40. Description Preparation Date:	
11/7/2025	
41. Available Attendance Forms:	
Theory and practical/weekly	
42. Number of Credit Hours (Total) / Number of Units (Total)	
Experimental 2/Theoretical 2	
43. Course administrator's name (mention all, if more than one name)	
Name: Ammar Erzaige Sabar	
44. Course Objectives	
Course Objectives	• Ability to understand the human anatomy

	<ul style="list-style-type: none"> • Distinguish different body systems and their functions.
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45. Teaching and Learning Strategies

Strategy	<p>Cognitive objectives: At the end of the course, the student will be able to</p> <ol style="list-style-type: none"> 1. Differentiate the body parts and their systems. 2. Name the medical terms related to the human body. 3. Relate each part to its system and function.
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46. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Anatomical position and body cavities	Anatomical position and body cavities	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam
2&3	2	Digestive system	Digestive system	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam
4	2	Respiratory system	Respiratory system	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam
5&6	2	Cardiovascular system	Cardiovascular system	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam
7	2	Urinary system	Urinary system	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam

				show (PowerPoint software).	• Final exam
8	2	Reproductive system	Reproductive system	in person education lectures using computer show (PowerPoint software).	• Short quizzes • Term exam • Final exam
9	2	Nervous system	Nervous system	in person education lectures using computer show (PowerPoint software).	• Short quizzes • Term exam • Final exam
10	2	Lymphatic system	Lymphatic system	in person education lectures using computer show (PowerPoint software).	• Short quizzes • Term exam • Final exam
11	2	Final Examination	Final Examination	in person education lectures using computer show (PowerPoint software).	• Short quizzes • Term exam • Final exam

47. Course Evaluation

- The exam is based on the quiz system and semester exams

- Preparing brief reports for a student and presenting them in the form of a seminar, activity and participation within the lecture

Distribution of the score out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

48. Learning and Teaching Resources

Required textbooks (curricular books, if any)	None
Main references (sources)	None
Recommended books and references (scientific journals, reports...)	Internet
Electronic References, Websites	Websites of magazines classified within Scopus, international publishing houses, and international universities

Weeks	Details
1	Anatomical position and body cavities
2 3&	Digestive system
4	Respiratory system
5&6	Cardiovascular system
7	Urinary system
8	Reproductive system
9	Nervous system
10	Lymphatic system
11	Final Examination

Course Description Form

49. Course Name:	General Biology
50. Course Code:	
51. Semester / Year:	2024-2025
52. Description Preparation Date:	22/7/2025
53. Available Attendance Forms:	official full attendance

official full attendance					
54. Number of Credit Hours (Total) / Number of Units (Total)					
75/ 3h					
55. Course administrator's name (mention all, if more than one name)					
Dr Mohammed Jaber Mohaibes					
Email: mohammed.mohaibe@gu.edu.iq					
56. Course Objectives					
Course Objectives <ol style="list-style-type: none"> 1. General Idea of Cells types 2. Cell Biochemistry 3. Biological Division Processes 4. DNA Replication 					
57. Teaching and Learning Strategies					
Lectures, Lab.Work, Smart Board, Seminars, Quizzes. etc					
58. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Understanding The Subjects	Introduction to Biology - History and General concepts of Biology -Cell theory -Comparing Prokaryotic and Eukaryotic Cells	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
2	3	Understanding The Subjects	Introduction to the Chemistry of Life - Cells chemistry and Chemical	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams

			bonds - Water -pH, Salts and ions		
3	3	Understanding The Subjects	Biologically Important Molecules: - Carbohydrates -Lipids -Proteins - Nucleic Acids	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
4	3	Understanding The Subjects	Introduction to Cell Structure and Function – Plasma Membrane , Passive transport, active transport, factors effect on permeability – Cytoplasm	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
5	3	Understanding The Subjects	Introduction to Cell Structure and Function - Cytoskeleton - Microfilaments, Intermediate Filaments, Microtubules, Flagella and Cilia	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
6	3	Understanding The Subjects	Eukaryotic cell organelles: - Mitochondria (morphology, structure), - lysosomes (types, function).	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
7	3	Understanding The Subjects	Eukaryotic cell organelles: - Golgi complex (morphology, function)	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
8	3	Understanding The Subjects	Eukaryotic cell organelles: - Endoplasmic reticulum (smooth & rough) and their function. -Vesicles and Vacuoles - Ribosome (protein synthesis).	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
9	3	Understanding The Subjects	Eukaryotic cell organelles: Chromosome structure – changes (duplication, translocation,	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams

10	3	Understanding The Subjects	DNA Replication and protein synthesis -The structure of the DNA	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
11	3	Understanding The Subjects	DNA Replication and protein synthesis - Transcription	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
12	3	Understanding The Subjects	DNA Replication and protein synthesis - Translation	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
13	3	Understanding The Subjects	Introduction to Reproduction at the Cellular Levels -The Cell Cycle - Mitosis	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
14	3	Understanding The Subjects	Introduction to Reproduction at the Cellular Levels –Meiosis -Prokaryotic Cell Division	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams
15	3	General Knowledge	Review	Lectures, Oral, Videos, Data Show and Smart Board Materials	Discussions & Exams

Course description (practical)		
Weeks	Laboratory sessions & Clinical requirements	Hours
1	General introduction of biological laboratory: Guidelines of laboratory-tools and equipment's	2
2	The Microscope: Types of microscopes-Parts of microscope.	2
3	Knowledge about the microscope and uses	2
4	=	2
5	Prepare microscopic slide smear for bacteria: Types of sm	2
6	Staining methods of smears.	2
7	Isolation of the microorganisms	2
8	Microscopically examination of the size & shape of the microorganisms.	2
9	Isolation of microorganisms from the instrument of x-rays.	2
10	Microscopically examination of Microorganisms from the instrument of x- rays.	2
12	Study the types of bacteria: GP & GN.	2
13	=	2
14	=	2
15	Culture media: types of culture Media	2

1. Course evaluation weekly examination, reports and HomeWorks	
2. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	1. Elizabeth o Grady, Jason Cashmore, Marsha, Carol Wismer (2018). <i>Principles of Biology- An introduction to Biological Concepts</i> . Second Edition. 2. Peter Raven (2016) <i>Biology</i> . Elven Edition. 3. VJ. Bekish, Yu.T. Nikulin (2006) <i>Practical Book on Medical Biology</i> .
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	www.pustakadwi.com

Course Description Form

59. Course Name:
General chemistry
60. Course Code:
RAD HMBA111
61. Semester / Year:
Semester1/2024-2025
62. Description Preparation Date:
11/7/2025
63. Available Attendance Forms:
Theory/practical /weekly
64. Number of Credit Hours (Total) / Number of Units (Total)
Experimental 3/Theoretical 2
65. Course administrator's name (mention all, if more than one name)
Name: Dr. Anwar S. Hussein Email: anwar2500@yahoo.com

66. Course Objectives	
Course Objectives	<p>Identifying chemical compounds and how to deal with them due to their risks and harm to human health.</p> <ul style="list-style-type: none"> - Linking the information he studies on subject of chemistry with what concerns him in his specialty, especially in the use of chemistry materials in the medical field. -Get used to adhering to the controls for dealing with and transporting chemicals in the field. <p>.....</p>
67. Teaching and Learning Strategies	
Strategy	<p>A- Cognitive objectives:</p> <ol style="list-style-type: none"> 1- Identifying chemical compounds and how to deal with them due to their risks and harm to human health 2- - Linking the information he studies in the subject of chemistry with what concerns him in his specialty, especially in the use of chemistry materials in <p>Developing, fixing and films</p> <ol style="list-style-type: none"> 3 - Getting used to adhering to the controls for dealing with and transporting chemicals in the specialty <p>B - Skills objectives for the course:</p> <ol style="list-style-type: none"> 1 - By working on the practical side of chemistry, the student acquires practical skills, especially in the field of chemistry

	<p>Be careful and patient to obtain the results of the experiment</p> <p>2 - The worker in the field of work in chemistry laboratories obtain experience in the field of research, preparing, writing and publishing research through</p> <p>The nature of work in this field</p> <p>3 - The student will have the ability to develop scientifically, have a broad range of thinking, and solve problems easily</p>
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68. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The atom & molecular structure and theory	The atom & molecular structure and theory	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
2	2	Chemical bonding	Chemical bonding	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
3	2	Liquid mixture	Liquid mixture	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
4	2	Quantitative & qualitative analysis methods.	Quantitative & qualitative analysis methods.	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
5	2	Molar & normal concentration method. Problems & discussion	Molar & normal concentration method. Problems & discussion	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam

				show (PowerPo software.	• Final exam
6	2	Acids, base – exampland proprtiess.	Acids, base – exampland proprtiess.	in person educat lectures using d show (PowerPo software.	• Short cuizzes • Term exam • Final exam
7	2	Buffer solutions-types	Buffer solutions-types	in person educat lectures using d show (PowerPo software.	• Short cuizzes • Term exam • Final exam
8	2	Principles of organic chemistry, hydrocarbons, alkenes, preparation properties reactions	Principles of organic chemistry, hydrocarbons, alkenes, preparation properties reactions	in person educat lectures using d show (PowerPo software.	• Short cuizzes • Term exam • Final exam
9	2	Alkenes & alkynes properties &reaction	Alkenes & alkynes properties &reaction	in person educat lectures using d show (PowerPo software.	• Short cuizzes • Term exam • Final exam
10	2	Electrolytes, electrochemistry	Electrolytes, electrochemistry	in person educat lectures using d show (PowerPo software.	• Short cuizzes • Term exam • Final exam
15	2	Final Examination	Final Examination	in person educat lectures using d show (PowerPo software.	• Short cuizzes • Term exam • Final exam

69. Course Evaluation

- The exam is based on the CUSE system and semester exams

- Distribution of the grade out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

70. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Chemistry for the Health Sciences George I. Sackheim
Main references (sources)	Nano technology and Application M.M.Radhi - principle of orgenal chemistry - اساس الكيمياء الحيوية د. جاسم جنديل - مدخل الى الكيمياء الحياتية : د. خولة احمد
Recommended books and references (scientific journals, reports...)	Internet
Electronic References, Websites	Websites of magazines classified within Scopus, internat publishing houses, and international universities

Weeks	Details
1	Historical Review of ultrasound imaging
2 & 3	Fundamental physics of ultrasound and interaction with tissues
4 & 5	Transducers and beam-forming
6	B-mode instrumentation
7 & 8	Properties, limitations and artefacts of B-mode images
9	Principles of Doppler ultrasound
10	Colour flow and tissue imaging
11	Quality assurance
12	3D ultrasound
13	Contrast agents
14	Safety of diagnostic ultrasound

15	Final Examination
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Course Description Form

1. Course Name: General Physics
2. Course Code: RAD 117
3. Semester / Year: second course / 2024-2025
4. Description Preparation Date: 1-1-2024
5. Available Attendance Forms: 105
6. Number of Credit Hours (Total) / Number of Units (Total): 3
7. Course administrator's name (mention all, if more than one name)
Name: Tarik Talib Issa Al Omran
Email: tarikalomran@gau.edu.iq
<u>General objective:</u> To give the students basic information about physics .

Special objective:

Enabling the student to learn valuable information in the theoretical concepts of physics .

Teaching and learning strategies for physics refer to the methods and approaches used by instructors to effectively deliver information . These strategies encompass various instructional techniques, activities, and resources designed to enhance the learning experience and promote skill development in ultrasound operation. Examples of teaching and learning strategies for physics of atom may include:

1. Lectures: Traditional classroom lectures covering theoretical principles, equipment components, and images .
2. Hands-On Demonstrations: Practical demonstrations
3. Case Studies: Analyzing real-world ultrasound imaging cases to apply knowledge and problem-solving skills in interpreting images, identifying artifacts, and optimizing image quality.
4. Group Discussions: Facilitating group discussions to encourage peer interaction, collaborative learning, and sharing of experiences
5. Lab Sessions: Conducting laboratory sessions where students can practice using ultrasound software, perform image reconstructions, and troubleshoot technical issues under supervision.
6. Simulation Exercises: Using computer-based simulations to simulate CT imaging scenarios, patient positioning, and image acquisition protocols for hands-on practice.
7. Interactive Multimedia: Utilizing interactive multimedia resources such as videos, animations, and virtual tours to supplement lectures.
9. Online Resources: Providing access to online resources, e-books, journals, and webinars

8. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understands the academic material	Concept Of Physics	Lectures, discussions	Quizzes, assignments
2	4	Understands the academic material	Theories of Motion	Lectures, case studies	Exams, research papers
3	4	Understands the academic material	The Newton's law and origin	Hands-on demonstrations and simulations	Practical exams, case studies
4	4	Understands the academic material	The types of force	Laboratory sessions, group lectures	Lab reports, presentations

5	4	Understands the academic material	The gases and its l	Practical simulations	session	Skills assessments, practical exams
6	4	Understands the academic material	The Electricity	Lectures, group discussions		Assessments, compliance checks
7	4	Understands the academic material	The Magnetism	Practical demonstrations		Skills assessments, evaluation
8	4	Understands the academic material	Type of Ionization ray	Workshops, practice	hands	Projects, presentation
9		Mid. Exam.				s
10		Final Exam.				

9. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc.

10. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Recommended books and references (scientific journals, reports...)

11. Fundamentals of Physics, David Halliday, Robert Resnick, Jearl Walker,

9th ed., Wiley, .1
2010

2.. Physics, David Halliday, Robert Resnick, Kenneth S. Krane, Vol. 1, 5th

	<p>ed., 2002.</p> <p>3. College Physics, Paul Peter Urone, .2 Roger Hinrichs, 2012</p> <p>4.E.Armitage ,Sixth Form ,Practical Physics ,Published by John Murray ,London ,July (1959)</p> <p>5.Elements of Nuclear Physics ,WALTER E.MEYERHOF ,McGraw-Hill ,USA ,1967.ISBN 07-041745-8</p>
Electronic References, Websites	

Course Description Form

71. Course Name:	Nursing Fundamentals
72. Course Code:	HMBA 117
73. Semester / Year:	2024-2025
74. Description Preparation Date:	11/7/2025
75. Available Attendance Forms:	

Theory/weekly					
76. Number of Credit Hours (Total) / Number of Units (Total)					
Experimental 2/Theoretical 2					
77. Course administrator's name (mention all, if more than one name)					
Name: MSC. Ammar Erzaige Sabar					
78. Course Objectives					
Course Objectives		<ul style="list-style-type: none"> • Ability to understand the human body and vital functions • Measure the vital signs and know the normal levels. • Recognize and treat the urgent cases like wounds. 			
79. Teaching and Learning Strategies					
Strategy	<p>Cognitive objectives: At the end of the course, the student will be able to</p> <ol style="list-style-type: none"> 1. Recognize the body's vital signs. 2. Differentiate the ways of measurements and different devices. 3. Deal efficiently with urgent cases and call the ones at risk. 				
80. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Principle of Nursing	Principle of Nursing	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam
2&3&4	6	Vital signs	Vital signs	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam
5	2	ROUTES OF DRUG ADMINISTRATION	ROUTES OF DRUG ADMINISTRATION	in person education lectures using data	<ul style="list-style-type: none"> • Short quiz

				show (PowerPoint software).	<ul style="list-style-type: none"> • Term exam • Final exam
6	2	Sepsis and infection control	Sepsis and infection control	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam
7	2	SKIN INTEGRITY AND WOUND CARE	SKIN INTEGRITY AND WOUND CARE	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
8	2	Final Examination	Final Examination	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

81. Course Evaluation

- The exam is based on the quiz system and semester exams
 - Preparing brief reports for a student and presenting them in the form of a seminar, activity and participation within the lecture
- Distribution of the score out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

82. Learning and Teaching Resources

Required textbooks (curricular books, if any)	None
Main references (sources)	None
Recommended books and references (scientific journals, reports...)	Internet
Electronic References, Websites	Websites of magazines classified within Scopus, international publishing houses and international universities

Weeks	Details
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1	Principle of Nursing
2&3&4	Vital signs
5	ROUTES OF DRUG ADMINISTRATION
6	Sepsis and infection control
7	SKIN INTEGRITY AND WOUND CARE
8	Final Examination

Course Description Form

1. Course Name: Physics of Atom
2. Course Code: RAD 117
3. Semester / Year: second course / 2023-2024
4. Description Preparation Date: 1-1-2024
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total): 3
7. Course administrator's name (mention all, if more than one name)
<p>Name: Tarik Talib Issa Al Omran</p> <p>Email: tarikalomran@gau.edu.iq</p>

8. Course Objectives					
Course Objectives	<u>General objective:</u>				
	To give the students basic information about physics of Atom .				
Course Objectives	<u>Special objective:</u>				
	Enabling the student to learn valuable information in the theoretical concepts of physics of atom.				
9. Teaching and Learning Strategies					
Strategy	<p>Teaching and learning strategies for physics of atom refer to the methods and approaches used by instructors to effectively deliver information . These strategies encompass various instructional techniques, activities, and resources designed to enhance the learning experience and promote skill development in ultrasound operation. Examples of teaching and learning strategies for physics of atom may include:</p> <ol style="list-style-type: none"> 1. Lectures: Traditional classroom lectures covering theoretical principles, equipment components, and images . 2. Hands-On Demonstrations: Practical demonstrations 3. Case Studies: Analyzing real-world ultrasound imaging cases to apply knowledge and problem-solving skills in interpreting images, identifying artifacts, and optimizing image quality. 4. Group Discussions: Facilitating group discussions to encourage peer interaction, collaborative learning, and sharing of experiences 5. Lab Sessions: Conducting laboratory sessions where students can practice using ultrasound software, perform image reconstructions, and troubleshoot technical issues under supervision. 6. Simulation Exercises: Using computer-based simulations to simulate CT imaging scenarios, patient positioning, and image acquisition protocols for hands-on practice. 7. Interactive Multimedia: Utilizing interactive multimedia resources such as videos, animations, and virtual tours to supplement lectures. 9. Online Resources: Providing access to online resources, e-books, journals, and webinars 				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Understands the academic material	Physical concept of Atom	Lectures, discussions	Quizzes, assignments
2	4	Understands the academic material	Theories explained the Atom	Lectures, studies	Exams, research papers

3	4	Understands the academic material	The rays and its origin	Hands-on demonstrations, simulations	Practical exams, case studies
4	4	Understands the academic material	The types of radioactive rays	Laboratory sessions, group lectures	Lab reports, presentations
5	4	Understands the academic material	The ionization rays and its properties	Practical sessions, simulations	Skills assessment, practical exams
6	4	Understands the academic material	The binding energy and the nucleus	Lectures, group discussions	Assessment, compliance checks
7	4	Understands the academic material	The radioactive decay and radioactive doses and its units	Practical demonstrations, discussions	Skills assessment, evaluation
8	4	Understands the academic material	X-ray, Beta, gamma neutrons emission	Workshops, hands-on practice	Projects, presentations
9		Mid. Exam.			s
10		Final Exam.			

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

<p>Recommended books and references (scientific journals, reports...)</p>	<p>11.Fundamentals of Physics, David Halliday, Robert Resnick, Jearl Walker, 9th ed.,Wiley, .1 2010</p> <p>2.. Physics, David Halliday, Robert Resnick, Kenneth S. Krane, Vol. 1, 5th ed., 2002.</p> <p>3. College Physics, Paul Peter Urone, .2 Roger Hinrichs, 2012</p> <p>4.E.Armitage ,Sixth Form ,Practical Physics ,Published by John Murray ,London ,July (1959)</p> <p>5.Elements of Nuclear Physics ,WALTER E.MEYERHOF, ,McGraw-Hill ,USA ,1967.ISBN 07-041745-8</p>
<p>Electronic References, Websites</p>	

Course Description Form

83. Course Name:	General Physiology
84. Course Code:	
85. Semester / Year:	1 st 2024–2025
86. Description Preparation Date:	22/7/2025
87. Available Attendance Forms: official full attendance	official full attendance
88. Number of Credit Hours (Total) / Number of Units (Total)	60h / 3
89. Course administrator's name (mention all, if more than one name)	Dr Mohammed Jaber Mohaibes

90. Course Objectives

Course Objectives

1. General Physiology of Human Organs
2. Description of Organ's Physiology
3. The Differentiations between Normal and abnormal physiological Processes of different organs
4. Expanding of knowledge by using different kind of references.

91. Teaching and Learning Strategies

Lectures, Slides show, Smart Board, Oral learning, Written Learning, Seminars...etc

92. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Introduction to physiology, cells, cell components and functions	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
2	2		Blood,function of blood , serum, plasm	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
3	2		Leukocyte, erythrocyte and platelets. Role of erythropoietin in erythrocyte production	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
4	2		Blood clotting	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
5	2		Fluid compartment in the body	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc

6	2		fluid shift	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
7	2		homeostasis	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
8	2		heart and blood vessels, Heart functions and heart valves	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
9	2		circulation	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
10	2		Blood pressure	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
11	2		The role of the kidney in maintaining blood pressure	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
12	2		respiratory system	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
13	2		Lung function measurement	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
14	2		The digestive system and its functions	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc
15	2		secretions of the gastrointestinal tract	Lectures, Oral, Videos, Seminars, Reports...etc	Lectures, Oral, Videos, Seminars, Reports...etc

Course description (practical)		
weeks	Laboratory sessions & <i>Clinical requirements</i>	hours
1	Introduction to physiology, cells, cell components and functions	2
2	Blood,function of blood , serum, plasm	2

3 4	Leukocyte, erythrocyte and platelets. Role of erythropoietin in erythrocyte production	2
5	Blood clotting	2
6	Fluid compartment in the body	2
7	fluid shift	2
8	homeostasis	2
9	heart and blood vessels, Heart functions and heart valves	2
10	circulation	2
12	Blood pressure	2
13	The role of the kidney in maintaining blood pressure	2
14	respiratory system	2
15	Lung function measurement	2

3. Course evaluation: weekly examination, reports, HomeWorks	
4. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	<ol style="list-style-type: none"> 1. Seeley's <i>anatomy and physiology</i> (eleven edition) Cinnamon L. VanPutte , Jennifer L. Regan & Andrew F. Russo (2017) 2. <i>Essentials of Human Anatomy & Physiology,</i> Global Edition Suzanne Keller Elaine Marieb (2017)
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

93. Course Name:
Physiology
94. Course Code:
95. Semester / Year:
2 ^{ed} Term2024-2025
96. Description Preparation Date:
22/7/2025
97. Available Attendance Forms: official full attendance
official full attendance
98. Number of Credit Hours (Total) / Number of Units (Total)
60h / 3 Units

99. Course administrator's name (mention all, if more than one name)

Dr. Mohammed Jaber Mohaibes

100. Course Objectives

- Course Objectives**
- 5. General Physiology of Human Organs
 - 6. Description of Organ's Physiology
 - 7. The Differentiations between Normal and abnormal physiological Processes of different organs
 - 8. Expanding of knowledge by using different kind of references.

101. Teaching and Learning Strategies

Lectures, Slides show, Smart Board, Oral learning, Written Learning, Seminars...etc

102. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understanding and Learning	Physiology of cardiovascular system: Components of CVS and their functions Systole, diastole, peripheral resistance	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
2	2	Understanding and Learning	Physiology of cardiovascular system: Components of CVS and their functions Systole, diastole, peripheral resistance	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations

3	2	Understanding and Learning	Physiology of Digestive system: stomach, gastric juice, regulation of stomach secretion, inhibition of secretion by nervous system, small intestine secretion	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
4	2	Understanding and Learning	Physiology of Pancreas and small and large intestine: pancreatic juice contains and function , regulation of pancreatic secretion, duodenum function , intestinal juice contents, large intestine	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
5	2	Understanding and Learning	Physiology of liver and gallbladder: liver functions, gallbladder function	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
6	2	Understanding and Learning	Physiology of renal system: Parts of urinary system, function of urinary system, urine formation process, glomerular filtration	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
7	2	Understanding and Learning	Selective process of urine formation: Tubular reabsorption, Regulation of urine concentration and	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations

			volume, tubular secretion, urine movements		
8	2	Understanding and Learning	Micturition: Micturition reflex regulation and urination	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
9	2	Understanding and Learning	Female reproductive system: Puberty in females menstrual cycle, menopause, female fertility and pregnancy	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
10	2	Understanding and Learning	Male reproductive system: gonadotropin, testosterone, puberty in males, regulation of male reproduction system, hormonal and neural mechanisms	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
11	2	Understanding and Learning	Physiology of nervous system: General organization , CNS, PNS, nerve fiber, brain parts, brainstem function, cerebrum function, nerve impulses, action potential, Arc, Motor system: Sensory system	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
12	2	Understanding and Learning	Tract of spinal cord: Descending, ascending, intersegmental	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations

13	2	Understanding and Learning	Physiology of spinal cord sections: Hemi section and complete section	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
14	2	Understanding and Learning	Endocrine control Mechanism: Adrenal gland hormones role and function	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations
15	2	Understanding and Learning	Endocrine control mechanism: Pituitary gland hormones role and function	Lectures, Oral, Videos, Seminars, Reports...etc	Oral & Written Examinations

Course description (practical)		
weeks	Laboratory sessions & <i>Clinical requirements</i>	hours
1	Physiology of cardiovascular system: Components of CVS and their functions Systole, diastole, peripheral resistance	2
2	Physiology of cardiovascular system: Components of CVS and their functions Systole, diastole, peripheral resistance	2
3 4	Physiology of Digestive system: stomach, gastric juice, regulation of stomach secretion, inhibition of secretion by nervous system, small intestine secretion	2
5	Physiology of Pancreas and small and large intestine: pancreatic juice contains and function , regulation of pancreatic secretion, duodenum function , intestinal juice contents, large intestine	2
6	Physiology of liver and gallbladder: liver functions, gallbladder function	2
7	Physiology of renal system: Parts of urinary system, function of urinary system, urine formation process, glomerular filtration	2

8	Selective process of urine formation: Tubular reabsorption, Regulation of urine concentration and volume, tubular secretion, urine movements	2
9	Micturition: Micturition reflex regulation and urination	2
10	Female reproductive system: Puberty in females menstrual cycle, menopause, female fertility and pregnancy	2
12	Male reproductive system: Function, testosterone, puberty in males, regulation of male reproduction system, hormonal and neural mechanisms	2
13	Physiology of nervous system: General organization , CNS, PNS, nerve fiber, brain parts, brainstem function, cerebrum function, nerve impulses, action potential, Arc, Motor system: Sensory system	2
14	Tract of spinal cord: Descending, ascending, intersegmental	2
15	Physiology of spinal cord sections: Hemi section and complete section	2

5. **Course evaluation:** weekly examination, reports, HomeWorks

6. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

3. Seeley's ***anatomy and physiology*** (eleven edition) Cinnamon L. VanPutte , Jennifer L. Regan & Andrew F. Russo (2017)
4. ***Essentials of Human Anatomy & Physiology,***

	Global Edition Suzanne Keller Elaine Marieb (2017)
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

103.	Course Name: computed tomography equipment techniques
104.	Course Code: RAD 208
105.	Semester / Year: second course / 2024-2025
106.	Description Preparation Date: 11-7-2025
107.	Available Attendance Forms:

108. Number of Credit Hours (Total) / Number of Units (Total) 4	
109. Course administrator's name (mention all, if more than one name) Name: Jassim Mohammed Najim Al-mashadani Email: alcedik@yahoo.com	
110. Course Objectives	
Course Objectives	Objectives aim to provide students with a comprehensive understanding of CT equipment techniques in various clinical settings.
111. Teaching and Learning Strategies	
Strategy	<p>Teaching and learning strategies for computed tomography (CT) equipment techniques refer to the methods and approaches used by instructors to effectively deliver information and facilitate understanding among students in the context of CT technology. These strategies encompass various instructional techniques, activities, and resources designed to enhance the learning experience and promote skill development in CT equipment operation, maintenance, and optimization. Examples of teaching and learning strategies for CT equipment techniques include:</p> <ol style="list-style-type: none"> 1. Lectures: Traditional classroom lectures covering theoretical principles, equipment components, and imaging techniques related to CT technology. 2. Hands-On Demonstrations: Practical demonstrations using CT equipment simulators or actual machines to illustrate operational procedures, image acquisition, and quality assurance techniques. 3. Case Studies: Analyzing real-world CT imaging cases to apply knowledge and problem-solving skills in interpreting images, identifying artifacts, and optimizing image quality. 4. Group Discussions: Facilitating group discussions to encourage peer interaction, collaborative learning, and sharing of experiences and insights related to CT equipment techniques. 5. Lab Sessions: Conducting laboratory sessions where students can practice using CT software, perform image reconstructions, and troubleshoot technical issues under supervision. 6. Simulation Exercises: Using computer-based simulations to simulate CT imaging scenarios, patient positioning, and image acquisition protocols for hands-on practice. 7. Interactive Multimedia: Utilizing interactive multimedia resources such as videos, animations, and virtual tours to supplement lectures and enhance understanding of complex CT concepts. 8. Guest Lectures and Workshops: Inviting guest speakers, industry experts, or CT technologists to conduct specialized workshops or seminars on advanced CT techniques, emerging technologies, and clinical applications. 9. Online Resources: Providing access to online resources, e-books, journals, and websites related to CT equipment techniques for self-paced learning and additional reference materials.
112. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	7	History of Computed Tomography	History of Computed Tomography -Limitations of conventional radiography	Lectures,	Quizzes, assignments
2	7	Basic principles of Scanners Generations of CT	Basic principles of CT Scanners Generations of CT -First - generation -Second - generation -Third - generation -Fourth - generation -Fifth - generation CT , electron beam CT (EBCT)	Lectures,	Exams, practical assessments
3	7	Helical / spiral CT Scanners	Helical / spiral CT Scanners Requirements for Volume Scanning : -slip - ring technology -dual source	Lectures,	Practical exams case studies
4	7	Interpolation Algorithms	Interpolation Algorithms -Pitch	Lectures,	Image analysis, presentations
5	7	Multislice Computed Tomography	Multislice Computed Tomography (MSCT) (multidetector - row)CT	Lectures,	Reports, quizzes
6	7	CT system design : (SSCT & MSCT)	CT system design : (SSCT & MSCT) - X - Ray imaging system (gantry) : -X - Ray Tube , X - Ray tubes in MSCT (Straton x - ray tube)	Lectures,	Skills assessment exams
7	7	-Collimation , -Filtration -Detector	-Collimation , -Filtration -Detector : Detector Characteristics & Selection	Lectures,	Assessments, compliance checks
8	7	-Control Console -Computer system -Patient Table	-Control Console -Computer system : image display, recording , storage , and communication system . -Patient Table or Couch	Lectures,	Projects, presentation

9	7	Reconstruction methods	Reconstruction methods : -Backprojection reconstruction -Filtered Backprojection	Lectures,	Clinical simulations, exams,
10	7	Iterative reconstruction	-Iterative reconstruction	Lectures,	Research paper final projects
11	7	CT image quality	CT image quality : -Image contrast -Spatial resolution	Lectures,	Assessments, practical exams
12	7	Image noise	-Image noise	Lectures,	Dosimetry tests safety evaluation
13	7	Image artifacts	-Image artifacts : Types and causes Common artifacts and correction techniques	Lectures,	Exams, practical assessments
14	7	Positron Emission Tomography	Positron Emission Tomography / (PET / CT) Single - Photon Emission / CT (SPECT / CT)	Lectures,	Presentations, reports
15	7	Advanced technical CT applications	Advanced technical CT applications : -CT Angiography -Cardiac CT Imaging -CT fluoroscopy	Lectures,	Exams, practical
113. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc					
114. Learning and Teaching Resources					
Required textbooks (curricular books, if any)					
Main references (sources)					
Recommended books and references (scientific journals, reports...)			1. Stewart Carlyle Bushong , " Radiologic Science Technologists Physics , Biology , and Protection Elsevier , Inc. , 7th edition , 2017 . 2. Chris Guy & Dominic ffytche , " An Introduction to Principles of Medical Imaging " Imperial College Press 2005 . 3. Perry Sprawls , " Physical principles of medical imaging " , 2nd Edition 1996 .		

	<p>4. J. Hsieh , " Computed Tomography : Principles Design , Artifacts , and Recent Advances " , 2nd Wiley Inter - science , Bellingham , Washington , US 2009)</p> <p>5. Euclid Seeram , " Computed tomography : physical principles , clinical applications , and quality control edition , Elsevier Inc. 2016</p>
Electronic References, Websites	

History of Computed Tomography Limitations of conventional radiography Basic principles of CT Scanners : Generations of CT First - generation Second - generation Third - generation • Fourth - generation Fifth - generation CT , electron beam (EBCT) Helical / spiral CT Scanners : Requirements for Volume Scanning : slip - ring tecnolgy dual source Interpolation Algorithms Pitch Multislice Computed Tomography (MSCT) (multidetector - row) CT .CT system design : (SSCT & MSCT) - X - Ray imaging system (gantry) : X - Ray Tube , X - Ray tubes in MSCT (Straton x - ray tube) Collimation , Filtration

Detector : Detector Characteristics & types 9 Control Console 9 Computer system : image display , recording , storage , and communication system . Patient Table or Couch Awwnstruction methods : Backprojection reconstruction Filtered Backprojection Iterative reconstruction CT image quality : Image contrast Spatial resolution Image noise Image artifacts : Types and causes Common artifacts and correction techniques Positron Emission Tomography / CT (PET / CT) Single - Photon Emission / CT (SPECT / CT) • Advanced technical CT applications : CT Angiography Cardiac CT Imaging CT fluoroscopy

Course Description Form

115. Course Name:	
Conventional Radiological Equipment Technology	
116. Course Code:	
RAD 201	
117. Semester / Year:	
Semester2/2024-2025	
118. Description Preparation Date:	
7/7/2025	
119. Available Attendance Forms:	
Theory/weekly	
120. Number of Credit Hours (Total) / Number of Units (Total)	
Experimental 3/Theoretical 2	
121. Course administrator's name (mention all, if more than one name)	
Name: MSC.Thalfaa Rasheed Ajeel	
Email: Thalfaa. Rasheed @ gau.edu.iq	
122. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • It consists of diagnosing and understanding mechanics and configuration of the device • The ability to use, examine and diagnose.....
123. Teaching and Learning Strategies	
Strategy	<p>A- Cognitive objectives:</p> <ul style="list-style-type: none"> --1 The student can understand the basic components of the device --2 The student can distinguish and diagnose the healthy and injured condition of the organ being examined 3-The student can explain the mechanism of the resulting image

	<p>4-The student can understand and write a report on this</p> <p>B - Skills objectives for the course:</p> <p>B1 - The student can solve problems related to the device</p> <p>B2 - The student can write the medical report</p> <p>B3 - The student can solve problems related to the organs inside the human body</p>
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124. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Historical Review Medical Imaging Applications	Historical Review Medical Imaging Applications	in person education lectures using data show (PowerPoint) software	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
2&3	2	Types of Medical Imaging Equipment (Imaging Modalities) Properties and Production of X-Ra	Types of Medical Imaging Equipment (Imaging Modalities) Properties and Production of X-Ra	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
4&5	2	Conventional X-Ray Machine: X- ray Tube/ Energiz Controlling the X ray Tube ((kVp adjustment, mA co	Conventional X-Ray Machine: X- ray Tube/ Energiz Controlling the X ray Tube ((kVp adjustment, mA con	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
6	2	X-Ray Image FormatioN	X-Ray Image FormatioN	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
7&8	2	Properties of X-Ray Detectors (Receptors) & Scre System Characteristics, Screen Film Combination, Car the Screen	Properties of X-Ray Detectors (Receptors) & Scre System Characteristics, Screen Film Combination, Car Screen	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
9	2	Dental Radiography	Dental Radiography	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam

					<ul style="list-style-type: none"> • Final exam
10	2	Mammographic ImaginG	Mammographic ImaginG	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
11	2	Fluoroscopic Imaging System5	Fluoroscopic Imaging System5	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
12	2	Fluoroscopic Imaging System5	Fluoroscopic Imaging System5	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
13	2	Basic of Ultrasound Imaging Contrast agents	Basic of Ultrasound Imaging Contrast agents	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
14	2	Ultrasound transducer and Operational modes	Ultrasound transducer and Operational modes	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
15	2	Final Examination	Final Examination	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

125. Course Evaluation

- The exam is based on the CUSE system and semester exams

- Preparing brief reports for a student and presenting them in the form of a seminar, activity and participation within the lecture

Distribution of the score out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

126. Learning and Teaching Resources

Required textbooks (curricular books, if any)

1. Medical physics / John R. Cameron and James G.(Skofroni Peter R. Hoskins, Kevin Martin, Abigail Thrush, "Diagnostic

	<p>Ultrasound: Physics and Equipment”, Cambridge University Press, (2010)</p> <p>2. Andreas Maier • Stefan Steidl, “Medical Imaging Systems Introductory Guide”, Springer, (1973).</p> <p>3. D.R. Dance, S. Christofides, A.D.A. Maidment, I.D. McLean, K.H. Ng “Diagnostic Radiology Physics”, International atomic energy agency, Vienna,(2014).</p>
Main references (sources)	<p>1. Peter R. Hoskins, Kevin Martin, Abigail Thrush, “Diagnostic Radiology Physics: A Guide for Teachers”, Cambridge University Press, (2010).</p> <p>2. Andreas Maier • Stefan Steidl, “Medical Imaging Systems Introductory Guide”, Springer, (1973).</p> <p>3. D.R. Dance, S. Christofides, A.D.A. Maidment, I.D. McLean, K.H. Ng “Diagnostic Radiology Physics”, International atomic energy agency, Vienna,(2014).</p>
Recommended books and references (scientific journals, reports...)	Internet
Electronic References, Websites	Websites of magazines classified within Scopus, international publishing houses, and international universities

Weeks	Details
1	Historical Review of ultrasound imaging
2 & 3	Fundamental physics of ultrasound and interaction with tissues
4 & 5	Transducers and beam-forming
6	B-mode instrumentation
7 & 8	Properties, limitations and artefacts of B-mode images
9	Principles of Doppler ultrasound
10	Colour flow and tissue imaging

11	Quality assurance
12	3D ultrasound
13	Contrast agents
14	Safety of diagnostic ultrasound
15	Final Examination

Here is the completed Course Description Form for Fundamentals of Radio-physics

Course Description Form : Fundamentals of Radiation Protection اساسيات الوقاية من الاشعاع

Field	Details
1. Course Name	Fundamentals of Radiation Protection (أساسيات الوقاية من الأشعاع)

Field	Details
2. Course Code	(To be filled by the institution)
3. Semester / Year	Second Stage / First Semester
4. Description Preparation Date	(To be filled by the institution)
5. Available Attendance Forms	Official full attendance
6. Credit Hours / Units	5 hours (2 theoretical + 3 practical) / 3 units
7. Course Administrator(s)	(To be filled by the institution)
8. Course Objectives	<ol style="list-style-type: none"> 1. Explain basic concepts of ionizing radiation. 2. Define radiation measurement units (SI). 3. List ALARA principles. 4. Explain dose limits for workers/public. 5. Discuss dose management for pregnancy/obesity. 6. Describe radiation detectors. 7. Estimate CT/fluoroscopy doses.
9. Teaching Strategies	Lectures, labs, assignments, reports, weekly exams.
10. Course Structure (Weekly Breakdown)	See detailed table below.
11. Practical Sessions	Radiation measurement, ALARA demos, barrier design, dosimeter calibration, CT/fluoroscopy dose labs.
12. Evaluation Methods	Weekly exams, reports, homework, practical assessments.
13. Required Textbooks	<ol style="list-style-type: none"> 1. Al-Qurayshi & AL-Mosawi (2015). 2. Hendee & Ritenour (2002). 3. Allisy-Roberts & Williams (2007). 4. Bushong (2017).

Field	Details
14. Recommended Resources	Scientific journals, reports, electronic references.

Weekly Course Structure

Week	Hours	Learning Outcomes	Unit/Subject	Teaching Method	Evaluation
1	2	Classify ionizing radiation & sources.	Classification, natural/artificial sources.	Lecture, discussion	Quiz, assignment
2	2	Define radiation units (SI).	Activity, exposure, absorbed dose, kerma.	Lecture, demo	Quiz, report
3	2	Apply ALARA principles.	Justification, optimization (time/distance/shielding).	Case study	Exam
4	2	Explain dose limits.	Occupational/public/patient limits.	Group work	Report
5	2	Classify exposure types.	Occupational/medical/public protection.	Discussion	Exam
6	2	Analyze occupational exposure.	Fluoroscopy, CT, surgery.	Practical demo	Report
7	2	Calculate patient doses.	Entrance Skin Exposure (ESE), Mean Marrow Dose (MMD).	Case study	Exam
8	2	Manage special cases.	Pregnancy/obesity dose strategies.	Group work	Quiz
9	2	Design barriers.	Primary/secondary barriers (leakage/scatter).	Demo	Exam

Week	Hours	Learning Outcomes	Unit/Subject	Teaching Method	Evaluation
10	2	Assess barrier thickness factors.	Material, distance, workload.	Discussion	Report
11	2	Operate detectors.	Gas-filled, scintillation, semiconductor.	Lab demo	Exam
12	2	Calibrate instruments.	Dosimeter calibration techniques.	Case study	Quiz
13	2	Use personnel dosimeters.	Film badges, TLDs, OSL, pocket dosimeters.	Group work	Exam
14	2	Compute CT doses.	CTDI, DLP, effective dose.	Lab demo	Report
15	2	Minimize fluoroscopy doses.	Patient/staff dose reduction.	Discussion	Exam

Practical Sessions

Week	Hours	Activity	Outcome
1-2	3	Radiation measurement labs.	Mastery of SI units.
3-4	3	ALARA principle demos.	Apply time/distance/shielding.
5-6	3	Dose limit calculations.	Compare occupational/public limits.
7-8	3	Detector usage (Geiger, scintillation).	Identify radiation types.
9-10	3	Barrier design simulations.	Calculate required thickness.

Week	Hours	Activity	Outcome
11-12	3	Dosimeter calibration.	Validate measurement accuracy.
13-15	3	CT/fluoroscopy dose labs.	Apply dose-reduction techniques.

Course Description Form

127.	Course Name:
Fundamentals of Radio-Physics	
128.	Course Code:

RAD 212					
129. Semester / Year:					
1 st semester 2024 – 2025					
130. Description Preparation Date:					
1 / 10 / 2024					
131. Available Attendance Forms: official full attendance					
Presence					
132. Number of Credit Hours (Total) / Number of Units (Total)					
2 hours per week / 30 hours for the entire course - 3 units					
133. Course administrator's name (mention all, if more than one name)					
Lecturer Dr. Naseer Mahdi Hadi – email: naseer.m.hadi@gu.edu.iq					
134. Course Objectives					
<p>Course Objectives</p> <p>Explain the tube voltage generation method.</p> <p>2. Identify the effects of heating and cooling an X-ray tube.</p> <p>3. Explain the methods of X-ray production.</p> <p>4. State the X-ray interaction processes.</p> <p>5. Identify the factors affecting the electron beam.</p> <p>6. Identify the factors affecting X-ray output and image contrast.</p> <p>7. Explain the quality assurance of exposure parameters.</p>					
135. Teaching and Learning Strategies					
1- Theoretical/through scientific lectures					
2- Practical/through practical lectures in the hospital.					
136. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understands the subject matter	Tube voltage generation: - Exposure timing - Load drop - Filament voltage	Lectures & Data show	Quiz
2	2	Understands the subject matter	X-ray tube limitations: - Line focus - Rotating anode tube - Temperature rating	Lectures & Data show	Quiz
3	2	Understands the subject matter	X-ray tube heating and cooling: - Heat production - Heat capacity	Lectures & Data show	Quiz

			Factors affecting heat capacity: - Focus area - Focal spot size - Anode rotation speed - Anode body		
4	2	Understands the subject matter	<ul style="list-style-type: none"> • X-ray production: - Characteristic radiation - Bremsstrahlung radiation • Emission spectrum • Bremsstrahlung radiation - Importance in imaging and dose: - Effect of electron energy - Effect of target material - Effect of filtration 	Lectures & Data show	Quiz
5	2	Understands the subject matter	<p>Characteristic radiation:</p> <ul style="list-style-type: none"> - Importance in imaging and dose - Effect of electron energy - Effect of target material - Effect of filtration 	Lectures & Data show	Quiz
6	2	Understands the subject matter	<p>Luminescence phenomenon:</p> <ul style="list-style-type: none"> - X-ray fluorescence - X-ray phosphorescence 	Lectures & Data show	Quiz
7	2	Understands the subject matter	<ul style="list-style-type: none"> • Electron tube power • Factors affecting the electron emission spectrum - milliamperes and milliamperes - kilovolts - voltage waveform - target material - filtering added 	Lectures & Data show	Quiz
8	2	Understands the subject matter	<p>X-ray Emission: Factors Affecting X-ray Spectra and X-ray Production:</p> <ul style="list-style-type: none"> - X-ray Intensity - Factors Affecting X-ray Amount 	Lectures & Data show	Quiz
9	2	Understands the subject matter	<p>X-ray quality:</p> <ul style="list-style-type: none"> - Penetration - Photon range - Filtering - Half-value layer 	Lectures & Data show	Quiz
10	2	Understands the subject matter	<ul style="list-style-type: none"> • Linear attenuation coefficient of X-rays • Interaction of X-rays with material processes - Photoelectric absorption - Compton process (modified scattering) - Effect of scattering angle • Unmodulated scattering 	Lectures & Data show	Quiz
11	2	Understands the subject matter	<ul style="list-style-type: none"> • Factors affecting image contrast: - Subject's linear attenuation coefficient 	Lectures & Data show	Quiz

			<ul style="list-style-type: none"> - Photon energy (KVp) - Soft tissue radiography - Calcium - Iodine and barium contrast media - Scattered radiation and contrast 		
12	2	Understands the subject matter	X-ray attenuation by: <ul style="list-style-type: none"> - The patient - Contrast media 	Lectures & Data show	Quiz
13	2	Understands the subject matter	Differential absorption: <ul style="list-style-type: none"> - Dependence on atomic number - Dependence on mass density 	Lectures & Data show	Quiz
14	2	Understands the subject matter	X-ray tube output parameters: <ul style="list-style-type: none"> - X-ray tube output - kV - mA-s - Automatic exposure control - Filtering - Focal spot metering 	Lectures & Data show	Quiz
15	2	Understands the subject matter	Equipment Tests: <ul style="list-style-type: none"> - Film Processing Speed 	Lectures & Data show	Quiz

Course description (practical)		
weeks	Laboratory sessions & <i>Clinical requirements</i>	hours
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

7. Course evaluation

The grade is distributed out of 100 based on the student's assigned tasks, such as daily preparation, daily, oral, and monthly exams, written reports, and the final exam (both theoretical and practical).

Semester work: 50 points = 35 theoretical + 15 practical

Final exam: 50 points = 35 theoretical + 15 practical

8. Learning and Teaching Resources

Required textbooks (curricular books, if any)	-----
Main references (sources)	1. M. Radhi Al-Qurayshi and H. Qasim. AL-Mosawi "Radiation Physics and its applications in diagnostic radiological techniques", Middle Technical University (MTU), Iraq, (2015) 2. W. R. Hendee and E. R. Ritenour "Medical Imaging Physics", 4th Edition, Wiley-Liss, Inc., (2002). 3. Allisy-Roberts PJ, Williams J. Farr's "physics for medical imaging". Elsevier Health Sciences; 2007 Nov 14. 4. Stewart Carlyle Bushong, "Radiologic Science for Technologists Physics, Biology, and Protection" Elsevier, Inc., 7th edition, 2017. 5. Perry Sprawls, "Physical principles of medical imaging", 2nd Edition 1996.
Recommended books and references (scientific journals, reports...)	Stewart C. Bushong ScD FAAPM FACR - Radiologic Science for Technologists_ Physics, Biology, and Protection-Mosby (2016) Tim Salditt, Timo Aspelmeier, Sebastian Aeffner. Biomedical Imaging_ Principles of Radiography, Tomography and Medical Physics-De Gruyter (2017). 3- Chris Guy, Dominic Ffytche - An introduction to the principles of medical imaging-Imperial College Press_ Distributed by World Scientific Pub (2005)
Electronic References, Websites	Lectures from Internet and YouTube

Course Description Form

137. Course Name:

Physics of Computed Tomography					
138. Course Code:					
RAD 218					
139. Semester / Year:					
2 nd semester 2024 – 2025					
140. Description Preparation Date:					
1 / 10 / 2024					
141. Available Attendance Forms: official full attendance					
Presence					
142. Number of Credit Hours (Total) / Number of Units (Total)					
2 hours per week / 30 hours for the entire course - 3 units					
143. Course administrator's name (mention all, if more than one name)					
Lecturer Dr. Naseer Mahdi Hadi – email: naseer.m.hadi@gu.edu.iq					
144. Course Objectives					
Course Objectives					
<ul style="list-style-type: none"> • Describe and explain the basic physics of a CT scanner and X-ray guidance. • Describe the method for acquiring the scan slice and pitch and the general characteristics of the resulting datasets. • Describe the method for acquiring the helical volume and the general characteristics of the resulting dataset. • Describe and explain the general concept of the back-projection method for image reconstruction. • Explain the methods of image reconstruction. • Explain the concept of pixels that are formed during image reconstruction. • Describe and explain the general range of CT scan numbers for tissues and materials in the human body. • Explain how windows contribute to high contrast sensitivity. 					
145. Teaching and Learning Strategies					
1- Theoretical/through scientific lectures 2- Practical/through practical lectures in the hospital.					
146. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	2	Understands the subject matter	Introduction and Overview	Lectures & Data show	Quiz
2	2	Understands the subject matter	Basic Physics: - The incident beam - Radiation attenuation - Energy dependence	Lectures & Data show	Quiz
3	2	Understands the subject matter	CT scan numbers: - Resolution and uniformity - Hounsfield scale	Lectures & Data show	Quiz
4	2	Understands the subject matter	CT image: - Windows - Window width and plane	Lectures & Data show	Quiz
5	2	Understands the subject matter	Data acquisition - Basic concepts of data acquisition - Sampling	Lectures & Data show	Quiz
6	2	Understands the subject matter	Data Acquisition Engineering: Data acquisition in: - First-generation scanners - Second-generation scanners - Third-generation scanners - Fourth-generation scanners	Lectures & Data show	Quiz
7	2	Understands the subject matter	Fifth-generation scanners - Helical-spiral geometry	Lectures & Data show	Quiz
8	2	Understands the subject matter	Multi-slice computed tomography (MSCT)	Lectures & Data show	Quiz
9	2	Understands the subject matter	Data processing: - Image reconstruction - Final view or shape	Lectures & Data show	Quiz
10	2	Understands the subject matter	Data flow in a CT scanner - Event sequence	Lectures & Data show	Quiz
11	2	Understands the subject matter	Image display, storage, and communication	Lectures & Data show	Quiz
12	2	Understands the subject matter	CT image format - Image matrix - Pixel - Voxel	Lectures & Data show	Quiz
13	2	Understands the subject matter	Field of view (FOV) in CT: - Display field of view (DFOV) - Scanning field of view (sFOV)	Lectures & Data show	Quiz
14	2	Understands the subject matter	Basic CT Physics	Lectures & Data show	Quiz
15	2	Understands the subject matter	Understanding Image Axes	Lectures & Data show	Quiz

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	hours
1		
2		
3		

4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

9. Course evaluation

The grade is distributed out of 100 based on the student's assigned tasks, such as daily preparation, daily, oral, and monthly exams, written reports, and the final exam (both theoretical and practical).

Semester work: 50 points = 35 theoretical + 15 practical

Final exam: 50 points = 35 theoretical + 15 practical

10. Learning and Teaching Resources

Required textbooks (curricular books, if a	-----
Main references (sources)	<ol style="list-style-type: none"> 1. M. Radhi Al-Qurayshi and H. Qasim. AL-Mosawi "Radiation Physics and its applications in diagnostic radiological techniques", Middle Technical University (MTU), Iraq, (2015). 2. W. R. Hendee and E. R. Ritenour "Medical Imaging Physics", 4th Edition, Wiley-Liss, Inc., (2002). 3. Stewart Carlyle Bushong, "Radiologic Science for Technologists Physics, Biology, and Protection" Elsevier, Inc., 7th edition, 2017. 4. Chris Guy & Dominic ffytche, "An Introduction to The Principles of Medical Imaging", Imperial College Press, 2005. 5. Perry Sprawls, "Physical principles of medical imaging", 2nd Edition 1996. 6. Euclid Seeram, "Computed tomography: physical principles, clinical applications, and quality control" 4 th edition, Elsevier Inc. 2016.
Recommended books and references (scientific journals, reports...)	<ol style="list-style-type: none"> 1- Stewart C. Bushong ScD FAAPM FACR - Radiologic Science for Technologists_ Physics, Biology, and Protection-Mosby (2016) 2- Tim Salditt, Timo Aspelmeier, Sebastian Aeffner. Biomedical Imaging_ Principles of Radiography, Tomography and Medical Physics-De Gruyter (2017).

	3- Euclid Seeram - Computed Tomography_ Physical Principles, Clinical Applications, and Quality Control- Saunders Elsevier (2015). 4- Chris Guy, Dominic Ffytche - An introduction to the principles of medical imaging-Imperial College Press_ Distributed by World Scientific Pub (2005)
Electronic References, Websites	Lectures from Internet and YouTube

Course Description Form

147.	Course Name:
Radiographic techniques of upper and lower limbs	
148.	Course Code:
RAD	
149.	Semester / Year:
2024–2025	
150.	Description Preparation Date:
11/7/2024	
151.	Available Attendance Forms:
Theory and practical/weekly	
152.	Number of Credit Hours (Total) / Number of Units (Total)
Experimental 2/Theoretical 2	
153.	Course administrator's name (mention all, if more than one name)
Name: Ammar Erzaige Sabar	
154.	Course Objectives

Course Objectives	<ul style="list-style-type: none"> • It consists of diagnosing and understanding mechanics and configuration of the device • The ability to use, examine and diagnose.....
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155. Teaching and Learning Strategies

Strategy	<p>A- Cognitive objectives:</p> <ol style="list-style-type: none"> 1 The student can understand the basic components of the device. 2 The student can distinguish and diagnose the healthy and injured condition of the limb being examined. 3-The student can explain the mechanism of the resulting image <p>B - Skills objectives for the course:</p> <ol style="list-style-type: none"> 1 - The student can solve problems related to the device 2 - The student can write the medical report 3 - The student can solve problems related to the limb of the human body.
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156. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Anatomical position and positioning terminology	Anatomical position and positioning terminology	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam
2	2	Radiographic quality characteristics of radiograph	Radiographic quality characteristics of radiograph	in person education lectures using data show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam

3	2	Radiographic Positioning of Shoulder	Radiographic Positioning of Shoulder	in person education lectures using clicker software (PowerPoint).	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam
4	2	Radiographic Positioning of Clavicle and sternoclavicular joint	Radiographic Positioning of the Clavicle and sternoclavicular joint	in person education lectures using clicker software (PowerPoint).	<ul style="list-style-type: none"> • Short quiz • Term exam • Final exam
5	2	Radiographic positioning of humerus	Radiographic positioning of humerus	in person education lectures using clicker software (PowerPoint).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
6	2	Radiographic positioning of Elbow and forearm	Radiographic positioning of Elbow and forearm	in person education lectures using clicker software (PowerPoint).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
7	2	Radiographic positioning of hand and wrist joint	Radiographic positioning of hand and wrist joint	in person education lectures using clicker software (PowerPoint).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
8	2	Radiographic positioning of pelvis	Radiographic positioning of pelvis	in person education lectures using clicker software (PowerPoint).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
9	2	Radiographic positioning of Hip joint	Radiographic positioning of Hip joint	in person education lectures using clicker software (PowerPoint).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
10	2	Radiographic positioning of sacroiliac joint and femur	Radiographic positioning of sacroiliac joint and femur	in person education lectures using clicker software (PowerPoint).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
11	2	Radiographic positioning of the knee joint	Radiographic positioning of the knee joint	in person education lectures using clicker software (PowerPoint).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

12	2	Radiographic positioning of Tibia and Fibula	Radiographic positioning of Tibia and Fibula	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
13	2	Radiographic positioning of ankle joint and foot	Radiographic positioning of ankle joint and foot	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
14	2	Final Examination	Final Examination	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

157. Course Evaluation

- The exam is based on the quiz system and semester exams
 - Preparing brief reports for a student and presenting them in the form of a seminar, activity and participation within the lecture
- Distribution of the score out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

158. Learning and Teaching Resources

Required textbooks (curricular books, if any)	None
Main references (sources)	None
Recommended books and references (scientific journals, reports...)	Internet
Electronic References, Websites	Websites of magazines classified within Scopus, international publishing houses and international universities

Weeks	Details
1	Anatomical position and positioning terminology
2	Radiographic quality and characteristics of radiograph
3	Radiographic Positioning of the Shoulder
4	Radiographic Positioning of the Clavicle and sternoclavicular joint
5	Radiographic positioning of humerus
6	Radiographic positioning of Elbow and forearm
7	Radiographic positioning of hand and wrist joint
8	Radiographic positioning of pelvis
9	Radiographic positioning of Hip joint
10	Radiographic positioning of sacroiliac joint and femur
11	Radiographic positioning of the knee joint
12	Radiographic positioning of Tibia and Fibula
13	Radiographic positioning of ankle joint and foot
14	Final Examination

Course Description Form

159.	Course Name:
Radiological Anatomy of lower Limbs	
160.	Course Code:
RAD 220	
161.	Semester / Year:
2024_2025	
162.	Description Preparation Date:

2025\7\20	
163.	Available Attendance Forms: official full attendance Attendance
164.	Number of Credit Hours (Total) / Number of Units (Total) 2 hour theory+2 hour practical =4 hour weekly \Total Hour =60 hour\3 po
165.	Course administrator's name (mention all, if more than one name) Ph.D. Hawraa Abdulameer Kareem Email: dr.hawraa1987@gmail.com
166.	Course Objectives Course Objectives: - Provide basic knowledge about the organization of the radiological anatomy of the lower extremities. - Highlight the clinical significance of the radiological anatomy of the lower extremities. - Describe the radiological anatomy of the lower extremities. A- Cognitive Objectives A1. Acquire basic knowledge about the organization and topography of the lower extremities. A2. Classify parts and components of the lower extremities on plastic models and images for imaging techniques. A3. Predict the clinical significance of neuroanatomical structures. A4. Describe the radiological and imaging anatomy of the lower extremities. A5. Establish a working knowledge of cross-sectional anatomy. B - Course Skill Objectives. B1. Demonstrate surface markings of anatomical structures on the lower extremities. B2. Demonstrate practical knowledge of cross-sectional anatomy of the lower extremities and related applications. B3. Demonstrate practical knowledge of cross-sectional and radiological anatomy of the lower extremities.
167.	Teaching and Learning Strategies

Formal lectures, interactive tutorials, and practical laboratory lessons.

1- Theoretical/through scientific lectures.

2- Practical/through practical lectures and hospital application.

168. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understands the subject matter	Bones of the pelvis	Lectures data show	Quiz
2	2	Understands the subject matter	Radiological anatomy the hip	Lectures data show	Quiz
3	2	Understands the subject matter	Anatomy of femur	Lectures data show	Quiz
4	2	Understands the subject matter	The radiological anatomy of knee joint	Lectures data show	Quiz
5	2	Understands the subject matter	Bones of lower limbs	Lectures data show	Quiz
6	2	Understands the subject matter	Arterial supply of the lower limb	Lectures data show	Quiz
7	2	Understands the subject matter	MID-TERM EXAM	Lectures data show	Quiz
8	2	Understands the subject matter	Bones of knee joint	Lectures data show	Quiz
9	2	Understands the subject matter	The foot	Lectures data show	Quiz
10	2	Understands the subject matter	ankle joint	Lectures data show	Quiz

11	2	Understands the subject matter	foot joints	Lectures data show	Quiz
12	2	Understands the subject matter	knee joint bones	Lectures data show	Quiz
13	2	Understands the subject matter	Blood supply of the lower limb	Lectures data show	Quiz
14	2	Understands the subject matter	Relevant MRI anatomy -of the lower limb	Lectures data show	Quiz
15	2	Understands the subject matter	Overview	Lectures data show	Quiz

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	hours
1	Bones of the pelvis: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
2	Radiological anatomy the hip: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
3	Anatomy of femur: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
4	The radiological anatomy of knee joint: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
5	Bones of lower limbs: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
6	Arterial supply of the lower limb: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
7	MID-TERM EXAM	2
8	Bones of knee joint: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
9	The foot: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2

10	ankle joint: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
11	foot joints: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
12	knee joint bones: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
13	Blood supply of the lower limb: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
14	Relevant MRI anatomy -of the lower limb: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
15	Overview	2

11. Course evaluation

weekly examination
reports
Homeworks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

169.	Course Name:
Radiological Anatomy of upper Limbs	
170.	Course Code:
RAD 219	
171.	Semester / Year:
2024_2025	
172.	Description Preparation Date:
2025\7\20	
173.	Available Attendance Forms: official full attendance
Attendance	
174.	Number of Credit Hours (Total) / Number of Units (Total)
2 hour theory+2 hour practical =4 hour weekly \Total Hour =60 hour\3 poin	
175.	Course administrator's name (mention all, if more than one name)
Ph.D. Hawraa Abdulameer Kareem Email: dr.hawraa1987@gmail.com	
176.	Course Objectives
<p>Course Objectives: Providing basic knowledge about the organization and topography of the central nervous system And upper limb</p> <p>Teaching and Learning Strategies</p> <p>Strategy:</p> <p>Knowledge and Comprehension</p> <ol style="list-style-type: none"> 1. Acquire basic knowledge about anatomical organization and topography. 2. Classify the parts and components of the upper extremities on plastic models and photographs for imaging techniques. 3. Predict the clinical significance of anatomical structures. 4. Describe the radiological and imaging anatomy of the head and upper extremities. 5. Establish a working knowledge of cross-sectional anatomy. 	
177.	Teaching and Learning Strategies

Formal lectures, interactive tutorials, and practical laboratory lessons.

1- Theoretical/through scientific lectures.

2- Practical/through practical lectures and hospital application.

178. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understands the subject matter	Bones of the Head	Lectures data show	Quiz
2	2	Understands the subject matter	Radiological Anatomy of the Head and Upper Extremities	Lectures data show	Quiz
3	2	Understands the subject matter	Anatomy of the Nose and Paranasal Spaces	Lectures data show	Quiz
4	2	Understands the subject matter	Radiological Anatomy of the Nose and Paranasal Spaces	Lectures data show	Quiz
5	2	Understands the subject matter	Bones of the Upper Extremities	Lectures data show	Quiz
6	2	Understands the subject matter	Arterial Supply of the Head and Upper Extremities	Lectures data show	Quiz

7	2	Understands the subject matter	MID-TERM EXAM	Lectures data show	Quiz
8	2	Understands the subject matter	Bones of the Shoulder Joint	Lectures data show	Quiz
9	2	Understands the subject matter	Hand	Lectures data show	Quiz
10	2	Understands the subject matter	Wrist Joint	Lectures data show	Quiz
11	2	Understands the subject matter	Elbow Joint	Lectures data show	Quiz
12	2	Understands the subject matter	Shoulder Joint	Lectures data show	Quiz
13	2	Understands the subject matter	Blood supply of the upper limb	Lectures data show	Quiz
14	2	Understands the subject matter	Relevant MRI anatomy -of the upper limb	Lectures data show	Quiz
15	2	Understands the subject matter	Overview	Lectures data show	Quiz

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	hours
1	Bone of head : anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
2	Radiological Anatomy of the Head and Upper Extremities: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
3	Anatomy of the Nose and Paranasal Spaces: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2

4	Radiological Anatomy of the Nose and Paranasal Spaces: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
5	Bones of the Upper Extremities: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
6	Arterial Supply of the Head and Upper Extremities: : anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
7	MID-TERM EXAM	2
8	Bones of the Shoulder Joint: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
9	Hand: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
10	Wrist Joint: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
11	Elbow Joint: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
12	Shoulder Joint: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
13	Blood supply of the upper limb: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
14	Relevant MRI anatomy -of the upper limb: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
15	Overview	2

13. Course evaluation

1. weekly examination
2. reports
3. Home works

14. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	<p>1- Snell R (2010): Clinical Neuroanatomy. 8th Ed. Lippincott Williams & Wilkins. Philadelphia.</p> <p>2- Sarah McWilliams: practical radiological anatomy. © 2011 by Taylor & Francis Gro LLC.</p>
Recommended books and references (scientific journals, reports...)	<ol style="list-style-type: none"> 1. MRI of the brain and spine (CD) 2. McMinn's colour atlas of human anatomy (CD) 3. McMinn & Abrahams's clinical atlas of human anatomy (CD) 4. Weir J & Abrahams P: Imaging atlas of the human body (CD) 5. Netter's Interactive Anatomy (CD) 6. Grant's atlas of anatomy (CD)
Electronic References, Websites	Lectures and reports from the Internet and YouTube

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Gilgamesh Ahliya University
2. University Department/Centre	The Medical Technical college/
3. Course title/code	211 RAD
4. Programme(s) to which it contributes	Technical Bachelor in x-ray
5. Modes of Attendance offered	Theoretical and practical
6. Semester/Year	Annually
7. Number of hours tuition (total)	240 hours
8. Date of production/revision of this specification	20/7/2025
9. Aims of the Course	That the student should be a degree in the end of the year to know the following.

All contrast media, radiological imaging with contrast media, different contrast imaging by x ray, CT scan, MRI

10. Learning Outcomes, Teaching ,Learning and Assessment Methode

A- Knowledge and Understanding

- A1. Knowledge & understanding radiological contrast media,
- A2. knowledge & understanding of radiographic contrast media .
- A3. A working knowledge of contrast media by X-ray, CT, MRI.
- A4.
- A5.

B. Subject-specific skills

- B1. Knowledge of all contrast media by imaging pictures.
- B2. Radiographic contrast media examinations of all body.
- B3.

Teaching and Learning Methods

- 1. Lectures.
- 2. Radiographic films.
- 3. laboratory.
- 4. Systematic training and summering.
- 5. View screen.

Assessment methods

- 1. Written test.
- 2. Quarterly exams.
- 3. Final exam.
- 4. Daily exam.
- 5. Commitment and permanence.

C. Thinking Skills

c1- learn how to deal with people in using contrast media

c2- to identify the presence of respect in the exam hall

c3- not encroach upon any person

Teaching and Learning Methods

1. Lectures.
2. Educational clinical radiology.
3. Systematic training and summers in hospitals.

Assessment methods

1. Written test and daily rating.
2. Quarterly exam.
3. Final exam.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1-access to the most important films to illustrate the most important modern scientific experiments

D2- access to the most important films radiographic imaging by YouTube

D3- see the most important types of radiation (view scientific films)

D4- access to books, magazines, reports and modern research

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1	3		Historical development of radiographic agent.	Theoretical + Practical	1-Quarterly exams. 2-Final exam. 3-Daily exam
2	3		Adverse effect of I.V water soluble contrast media on specific organs	Theoretical + Practical	
3	3		Methods of imaging of GIT tract with barium water soluble contrast agents.	Theoretical + Practical	
4	3		Barium examination : swallow and meal.	Theoretical + Practical	
5	3		Barium examination: follow through, small bowel anema.	Theoretical + Practical	
6	3		Barium examination : barium enema, instant enema, air enema.	Theoretical + Practical	
7	3		Reduction of intussusception.	Theoretical + Practical	
8	3		Sonogram, retrograde ileogram, colostomy enema, loopogram, herniogram & Evacuating proctogram .	Theoretical + Practical	

9	3		Methods of imagings of hepatobiliary system .	Theoretical + Practical	
10	3		U/S of the liver ,gall bladder and biliary system	Theoretical + Practical	
11	3		C.T for the liver biliary tree.	Theoretical + Practical	
12	3		MRI of the liver	Theoretical + Practical	
13	3		Intraoperative & postoperative T- tube, cholangiography .	Theoretical + Practical	
14	3		Biliary drainage	Theoretical + Practical	
15	3		Methods of imagings of urinary tracts	Theoretical + Practical	
16	3		Excretion urography.	Theoretical + Practical	
17	3		C.T urinary tract.	Theoretical + Practical	
18	3		Magnetic MRI of the urinary tract.	Theoretical + Practical	
19	3		Micturating cystourethrography.	Theoretical + Practical	
20	3		Ascending urethrography in the male.	Theoretical + Practical	
21	3		Retrograde pyelourethrography.	Theoretical + Practical	

22	3		Percutaneous nephrostomy & nephrolithotomy.	Theoretical + Practical	
23	3		Methods of imagings of male & femals reproductive system.	Theoretical + Practical	
24	3		Hystrosalpingography.	Theoretical + Practical	
25	3		C.T & MRI of the reproductive system.	Theoretical + Practical	
26	3		Methods n imaging of respiratory system.	Theoretical + Practical	
27	3		C.T of respiratory system .	Theoretical + Practical	
28	3		Guided lung biopsy. C.T scan	Theoretical + Practical	
29	3		Methods of imagings pulmonary embolism .	Theoretical + Practical	
30	3		Pulmonary arteriography and pet-C.T scan for respiratory system.	Theoretical + Practical	

12. Infrastructure

Required reading:

- CORE TEXTS
- COURSE MATERIALS
- OTHER

Special requirements (include for example workshops, periodicals, IT software, websites)

Community-based facilities (include for example, guest Lectures , internship , field studies)	Lectures , internship , field studies
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13. Admissions	
Pre-requisites	Students get special books on radiographic imaging using contrast media
Minimum number of students	
Maximum number of students	

Course Description Form

179. Course Name:	
Computer Applications1	
180. Course Code:	
RAD 313	
181. Semester / Year:	
Semester2/2024-2025	
182. Description Preparation Date:	
7/7/2025	
183. Available Attendance Forms:	
Theory/weekly	
184. Number of Credit Hours (Total) / Number of Units (Total)	
Experimental 3/Theoretical 2	
185. Course administrator's name (mention all, if more than one name)	
Name: MSC.Thalfaa Rasheed Ajeel Email: Thalfaa. Rasheed @ gau.edu.iq	
186. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • It consists of diagnosing and understanding the mechanics and configuration of the device • The ability to use, examine and diagnose.....

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187. Teaching and Learning Strategies

Strategy	<p>A- Cognitive objectives:</p> <p>--1 The student can understand the basic components of the device</p> <p>-2 The student can distinguish and diagnose the healthy and injured condition of the organ being examined</p> <p>3-The student can explain the mechanism of the resulting image</p> <p>4-The student can understand and write a report on this</p> <p>B - Skills objectives for the course:</p> <p>B1 - The student can solve problems related to the device</p> <p>B2 - The student can write the medical report</p> <p>B3 - The student can solve problems related to the organs inside the human body</p>
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188. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	<p>The Computer Meets Medicine and Biology:</p> <p>Emergence of a Disciplin, Medical Data: Their</p> <p>Acquisition, Storage, and Use.</p>	<p>The Computer Meets Medicine and Biology:</p> <p>Emergence of a Disciplin, Medical Data: Their</p> <p>Acquisition, Storage, and Use.</p>	in person education lec using data show (Power software.	<ul style="list-style-type: none"> • Shortc uizzes • Term exam • Final exam
2&3	2	<p>Medical Decision-Making: Probabilistic</p> <p>Medical Reasoning, Essential Concepts for Medical</p> <p>Computing.</p> <p>Standards in Medical Informatics, Ethics and Health</p> <p>Informatics: Users, Standards, and Outcomes.</p>	<p>Medical Decision-Making: Probabilistic</p> <p>Medical Reasoning, Essential Concepts for Medical</p> <p>Computing.</p> <p>Standards in Medical Informatics, Ethics and Health</p> <p>Informatics: Users, Standards, and Outcomes.</p>	in person education lec using data show (Power software.	<ul style="list-style-type: none"> • Short cuizzes • Term exam • Final exam

4&5	2	Computer-Based Patient-Record Systems, Management of Information in Integrated. Public Health and Consumer Uses of Health Information: Education, Research, Policy, Prevention, and Quality Assurance	Computer-Based Patient-Record Systems, Management of Information in Integrated. Public Health and Consumer Uses of Health Information: Education, Research, Policy, Prevention, and Quality Assurance	in person education led using data show (Power software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
6	2	Patient-Care Systems	Patient-Care Systems	in person education led using data show (Power software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
7&8	2	Patient-Monitoring Systems	Patient-Monitoring Systems	in person education led using data show (Power software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
9	2	Patient-Monitoring Systems	Patient-Monitoring Systems	in person education led using data show (Power software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
10	2	Imaging Systems	Imaging Systems	in person education led using data show (Power software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
11	2	Imaging Systems	Imaging Systems	in person education led using data show (Power software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
12	2	Imaging Systems	Imaging Systems	in person education led using data show (Power software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
13	2	Information-Retrieval Systems	Information-Retrieval Systems	in person education led using data show (Power software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
14	2	Clinical Decision-Support Systems	Clinical Decision-Support Systems	in person education led using data show (Power software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
15	2	Final Exam	Final Exam	in person education led using data show (Power software.	<ul style="list-style-type: none"> • Short quizzes • Term exam

				• Final exam
189. Course Evaluation				
<p>– The exam is based on the CUSE system and semester exams</p> <p>- Preparing brief reports for a student and presenting them in the form of a seminar, activity and participation within the lecture</p> <p>Distribution of the score out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.</p>				
190. Learning and Teaching Resources				
Required textbooks (curricular books, if any)	<p>Text Books:</p> <p>اللجنة النزاريت: د زياد هوزد عيب و آخروي، بأشراف م.اساسيات الحاسب و حطيقاهه الوكخبيت ، أ 1-الخاصت بخطير</p> <p>هيارات الطليت في هادة الحاسب ، وزارة الخعلين العالي و البحث العلوي ، دائرة البحث و الخطير ، ج 4112 ، 1 .</p> <p>د غساي حويد عيب الوجيد و آخروي ، ، أ (أساسيات التخريج (اساسيات الحاسب و حطيقاهه الوكخبيت 2-اللجنة :بأشراف</p> <p>النزاريت الخاصت بخطير هيارات الطليت في هادة الحاسب ، وزارة الخعلين العالي و البحث العلوي ، دائرة البحث</p> <p>References: 2، 4112 و الخطير ، ج</p> <p>Book link (http://amazon.com/internet-computing)</p> <p>Introductory Guide”, Springer, (1973).</p> <p>3. D.R. Dance, S. Christofides, A.D.A. Maidment, I.D. McLean, K.H. Ng “Diagnostic Radiology Physics”, International atomic energy agency, Vienna,(2014).</p>			
Main references (sources)	<p>.Text Books:</p> <p>اللجنة النزاريت: د زياد هوزد عيب و آخروي، بأشراف م.اساسيات الحاسب و حطيقاهه الوكخبيت ، أ 1-الخاصت بخطير</p> <p>هيارات الطليت في هادة الحاسب ، وزارة الخعلين العالي و البحث العلوي ، دائرة البحث و الخطير ، ج 4112 ، 1 .</p> <p>د غساي حويد عيب الوجيد و آخروي ، ، أ (أساسيات التخريج (اساسيات الحاسب و حطيقاهه الوكخبيت 2-اللجنة :بأشراف</p> <p>النزاريت الخاصت بخطير هيارات الطليت في هادة الحاسب ، وزارة الخعلين العالي و البحث العلوي ، دائرة البحث</p> <p>References: 2، 4112 و الخطير ، ج</p> <p>Book link (http://amazon.com/internet-computing)</p>			
Recommended books and references (scientific journals, reports...)	Internet			
Electronic References, Websites	Websites of magazines classified within Scopus, international publishing houses, and international universities			

Weeks	Details
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1	Display OS's basic on shutdown computer, log on, restart, sleep, using mouse (pointing, selecting, dragging and executing).
2 & 3	Using desktop, moving around the desktop and using the main application icons, using the start button, open, close and uninstall. 3 Looking at window details (title bar, tools bar, address bar, status bar and windows' content), expand and collapse and close window, moving and resizing window
4 & 5	Work with drive, folders and files using the listed operation, using common shortcuts (Ctrl + C, +V, +A, +S ... etc.), restore folder or files. 5 Identify the h
6	Explain microprocessor chip, types of memory (RAM, ROM and SSD Drive), memory units of measurements, storage devices, how to use keyboard, mouse, printers and other peripherals, identifying motherboard and their ports, how to use computer recourses.
7 & 8	Identifying the control panel icon, changing desktop icon, wallpaper, display type and size, setup time and date, using language options, using accessibility. 8 Power off computer using different options, understanding the mode of operation, create user account, log off, log in, changing account

9	<p>Understanding the application software, type and their usage, how install and uninstall programs and</p> <p>display their difference from delete, update or reinstall the software</p>
10	<p>Delete systematically unnecessary files, scan disk, understand the most common troubleshooting of</p> <p>computer or software, copy files or disk, using antiviruses, getting help for windows, getting online</p> <p>help.</p>
11	<p>Exercise of checking connection of your computer system to the internet, and use a simple utility</p> <p>(ping request) to test whether your internet connection is functioning or not, open web sites of</p> <p>different domains. (.net, .org, .com, .edu).</p>
12	<p>Open different web browsers (internet explorer, Firefox, chrome and others explain their function</p> <p>(addressing, uploading and downloading, and searching) and features (back, forward, and refresh</p> <p>buttons, home page, Tabs, favorites \ bookmarks, checking the history, plug-ins\add-ons), connect to</p> <p>the internet, identifying networks and their types</p>
13	<p>Security (Password, Password recovery information, and alternative e-mail), sending e-mail (To, CC,</p> <p>BCC, and subject), attaching file to e-mail, building contacts list and others.</p> <p>Sending E-mail using outlook (with exploring all properties above).</p>
14	<p>Protecting Your Data or Computer (Identifying Software Threats, Understanding Viruses), Protecting</p> <p>Yourself While Online; Buying Online; How Much Information Should I Share?, Protecting Your</p> <p>Privacy).</p>

15	<p>Narrowing the Search; Evaluating the Information (Reliability and Relevance; Validity and Authenticity; Objectivity and Bias).</p> <p>Try to make password, try to remove files without recoverable ability (ex: flickr.com, youtube.com).</p> <p>Try web search for certain key words using different search engine (ex: Google, Bing) also search</p> <p>multimedia files (Pictures, audio or video) in specialized search engine (ex: Fliker.com, youtube.com).</p> <p>Find specific and accurate information using Google (reduce no. of keywords, use quotation marks, use OR, search within certain site, and others).</p>
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Course Description Form

191.	Course Name:	
	Computer Applications2	
192.	Course Code:	
	RAD 313	
193.	Semester / Year:	
	Semester2/2024-2025	
194.	Description Preparation Date:	
	7/7/2025	
195.	Available Attendance Forms:	
	Theory/weekly	
196.	Number of Credit Hours (Total) / Number of Units (Total)	
	Experimental 3/Theoretical 2	
197.	Course administrator's name (mention all, if more than one name)	
	Name: MSC.Thalfaa Rasheed Ajeel	
	Email: Thalfaa. Rasheed @ gau.edu.iq	
198.	Course Objectives	
	Course Objectives	<ul style="list-style-type: none"> • It consists of diagnosing and understanding the mechanics and configuration of the device • The ability to use, examine and diagnose.....
199.	Teaching and Learning Strategies	

Strategy	<p>A- Cognitive objectives:</p> <p>--1 The student can understand the basic components of the device</p> <p>-2 The student can distinguish and diagnose the healthy and injured condition of the organ being examined</p> <p>3-The student can explain the mechanism of the resulting image</p> <p>4-The student can understand and write a report on this</p> <p>B - Skills objectives for the course:</p> <p>B1 - The student can solve problems related to the device</p> <p>B2 - The student can write the medical report</p> <p>B3 - The student can solve problems related to the organs inside the human body</p>
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200. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	<p>The Computer Meets Medicine and Biology:</p> <p>Emergence of a Discipline, Medical Data: Their Acquisition, Storage, and Use.</p>	<p>The Computer Meets Medicine and Biology:</p> <p>Emergence of a Discipline, Medical Data: Their Acquisition, Storage, and Use.</p>	in person education lectures using show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
2&3	2	<p>Medical Decision-Making: Probabilistic</p> <p>Medical Reasoning, Essential Concepts for Medical Computing.</p> <p>Standards in Medical Informatics, Ethics and Health</p> <p>Informatics: Users, Standards, and Outcomes.</p>	<p>Medical Decision-Making: Probabilistic</p> <p>Medical Reasoning, Essential Concepts for Medical Computing.</p> <p>Standards in Medical Informatics, Ethics and Health</p> <p>Informatics: Users, Standards, and Outcomes.</p>	in person education lectures using show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
4&5	2	<p>Computer-Based Patient-Record Systems, Management of Information in Integrated.</p> <p>Public Health and Consumer Uses of Health</p> <p>Information: Education, Research, Policy, Prevention, and Quality Assurance</p>	<p>Computer-Based Patient-Record Systems, Management of Information in Integrated.</p> <p>Public Health and Consumer Uses of Health</p> <p>Information: Education, Research, Policy, Prevention, and Quality Assurance</p>	in person education lectures using show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

6	2	Patient-Care Systems	Patient-Care Systems	in person education lectures use show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
7&8	2	Patient-Monitoring Systems	Patient-Monitoring Systems	in person education lectures use show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
9	2	Patient-Monitoring Systems	Patient-Monitoring Systems	in person education lectures use show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
10	2	Imaging Systems	Imaging Systems	in person education lectures use show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
11	2	Imaging Systems	Imaging Systems	in person education lectures use show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
12	2	Imaging Systems	Imaging Systems	in person education lectures use show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
13	2	Information-Retrieval Systems	Information-Retrieval Systems	in person education lectures use show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
14	2	Clinical Decision-Support Systems	Clinical Decision-Support Systems	in person education lectures use show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
15	2	Final Exam	Final Exam	in person education lectures use show (PowerPoint) software.	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

201. Course Evaluation

– The exam is based on the CUSE system and semester exams

- Preparing brief reports for a student and presenting them in the form of a seminar, activity and participation within the lecture

Distribution of the score out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

202. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Text Books:

1-اللجنة الجزائرية الخاصة بتطوير: د زياد هوو عبد وأخري، بالتراف، أساسيات الحاسب وحقيقاه الوكبيت ، أ ،

. 1. 4112 هجرات الطليت في هادة الحاسب ، وزارة الخطين العالي والبحث الطوي ، دائرة البحث والخطير ، ج

2-اللجنة: د عساي حويد عبد الوجيد وأخري، بالتراف ، أ) أساسيات التخريج (أساسيات الحاسب وحقيقاه الوكبيت

الجزائري الخاصة بتطوير هجرات الطليت في هادة الحاسب ، وزارة الخطين العالي والبحث الطوي ، دائرة البحث

References: 2. 4112 والخطير ، ج

Book link (<http://amazon.com/internet-computing>)

	<p>Introductory Guide", Springer, (1973).</p> <p>3. D.R. Dance, S. Christofides, A.D.A. Maidment, I.D. McLean, K.H. Ng "Diagnostic Radiology Phys International atomic energy agency, Vienna,(2014).</p>
Main references (sources)	<p>.Text Books:</p> <p>1-اللجنة التشاريت الخاصة بختبر: د زياد هويد عبد وأخرى، بأثراف ،اساسيات الحاسب وحطيقاه الوكبيت ، أ .1. 4112مهارات الطليت في هاد الحاسب ، وزارة الخطين العالي والبتح العلوي ، دائرة البتخ والختبر ، ج</p> <p>2-اللجنة: د عساي حويد عبد الوجيد وأخرى، بأثراف ، أ)اساسيات التخزينج (اساسيات الحاسب وحطيقاه الوكبيت التشاريت الخاصة بختبر مهارات الطليت في هاد الحاسب ، وزارة الخطين العالي والبتح العلوي ، دائرة البتخ</p> <p>.References: 2. 4112والختبر ، ج</p> <p>Book link (http://amazon.com/internet-computing)</p>
Recommended books and references (scientific journals, reports...)	Internet
Electronic References, Websites	Websites of magazines classified within Scopus, international publishing houses, and international universities

Weeks	Details
1	Display OS's basic on shutdown computer, log on, restart, sleep, using mouse (pointing, selecting, dragging and executing).
2 & 3	Using desktop, moving around the desktop and using the main application icons, using the start button, open, close and uninstall. 3 Looking at window details (title bar, tools bar, address bar, status bar and windows' content), expand and collapse and close window, moving and resizing window
4 & 5	Work with drive, folders and files using the listed operation, using common shortcuts (Ctrl + C, +V, +A, +S ... etc.), restore folder or files. 5 Identify the h
6	Explain microprocessor chip, types of memory (RAM, ROM and SSD Drive), memory units of measurements, storage devices, how to use keyboard, mouse, printers and other peripherals, identifying motherboard and their ports, how to use computer resources.
7 & 8	Identifying the control panel icon, changing desktop icon, wallpaper, display type and size, setup time and date, using language options, using accessibility. 8 Power off computer using different options, understanding the mode of operation, create user account, log off, log in, changing account

9	Understanding the application software, type and their usage, how install and uninstall programs and display their difference from delete, update or reinstall the software
10	Delete systematically unnecessary files, scan disk, understand the most common troubleshooting of computer or software, copy files or disk, using antiviruses, getting help for windows, getting online help.
11	Exercise of checking connection of your computer system to the internet, and use a simple utility (ping request) to test whether your internet connection is functioning or not, open web sites of different domains. (.net, .org, .com, .edu).
12	Open different web browsers (internet explorer, Firefox, chrome and others explain their function (addressing, uploading and downloading, and searching) and features (back, forward, and refresh buttons, home page, Tabs, favorites \ bookmarks, checking the history, plug-ins\add-ons), connect to the internet, identifying networks and their types
13	Security (Password, Password recovery information, and alternative e-mail), sending e-mail (To, CC, BCC, and subject), attaching file to e-mail, building contacts list and others. Sending E-mail using outlook (with exploring all properties above).
14	Protecting Your Data or Computer (Identifying Software Threats, Understanding Viruses), Protecting Yourself While Online; Buying Online; How Much Information Should I Share?, Protecting Your Privacy).
15	Narrowing the Search; Evaluating the Information (Reliability and Relevance; Validity and Authenticity; Objectivity and Bias). Try to make password, try to remove files without recoverable ability (ex: flickr.com, youtube.com). Try web search for certain key words using different search engine (ex: Google, Bing) also search multimedia files (Pictures, audio or video) in specialized search engine (ex: Fliker.com, youtube.com). Find specific and accurate information using Google (reduce no. of keywords, use quotation marks, use OR, search within certain site, and others).

Course Description Form

203. Course Name:	
Equipment Techniques of magnetic resonance imaging	
204. Course Code:	
RAD 304	
205. Semester / Year:	
Semester1/2025-2026	
206. Description Preparation Date:	
7/7/2025	
207. Available Attendance Forms:	
Theory/weekly	
208. Number of Credit Hours (Total) / Number of Units (Total)	
Experimental 3/Theoretical 2	
209. Course administrator's name (mention all, if more than one name)	
Name: MSC.Thalfaa Rasheed Ajeel	
Email: Thalfaa. Rasheed @ gau.edu.iq	
210. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • It consists of diagnosing and understanding the mechar and configuration of the device • The ability to use, examine and diagnose.....

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211. Teaching and Learning Strategies

Strategy	<p>A- Cognitive objectives:</p> <p>--1 The student can understand the basic components of the device</p> <p>-2 The student can distinguish and diagnose the healthy and injured condition of the organ being examined</p> <p>3-The student can explain the mechanism of the resulting image</p> <p>4-The student can understand and write a report on this</p> <p>B - Skills objectives for the course:</p> <p>B1 - The student can solve problems related to the device</p> <p>B2 - The student can write the medical report</p> <p>B3 - The student can solve problems related to the organs inside the human body</p>
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212. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Magneticresonance imagingsystem components introduction overview	Magneticresonance imagingsystem components introduction overview	in personeducat lectures using d show (PowerPo software.	<ul style="list-style-type: none"> • Shortc uizze • Term exam • Final exam
2&3	2	Magnet:magnet type -permanent magnets -resistive magnets -superconducting magnets Gradient coils:type&function	Magnet:magnet type -permanent magnets -resistive magnets -superconducting magnets Gradient coils:type&function	in person educat lectures using d show (PowerPo software.	<ul style="list-style-type: none"> • Short cuizze • Term exam • Final exam

4&5	2	<p>Radio-frequency system:</p> <ul style="list-style-type: none"> -transmitter & receiver coils -RF coils type: -surface coils -volume RF coils -shimming & magnetic field shielding : coils types -active;-passive 	<p>Radio-frequency system:</p> <ul style="list-style-type: none"> -transmitter & receiver coils -RF coils type: -surface coils -volume RF coils -shimming & magnetic field shielding : coils types -active;-passive 	<p>in person education lectures using d show (PowerPo software.</p>	<ul style="list-style-type: none"> • Short cuizze • Term exam • Final exam
6	2	<p>MRI computer system: types & function</p> <ul style="list-style-type: none"> -acquisition control -image reconstruction -image storage and retrieval -viewing control and post processing -MRI system electronics -frequency synthesizer -radio frequency amplifier -magnet power supply -sequencing system 	<p>MRI computer system: types & function</p> <ul style="list-style-type: none"> -acquisition control -image reconstruction -image storage and retrieval -viewing control and post processing -MRI system electronics -frequency synthesizer -radio frequency amplifier -magnet power supply -sequencing system 	<p>in person education lectures using d show (PowerPo software.</p>	<ul style="list-style-type: none"> • Shortc uizze • Term exam • Final exam
7&8	2	<p>.data acquisition: spatial encoding</p> <ul style="list-style-type: none"> - Frequency encoding - Phase encoding - Slice encoding - Slice selection - Slice location - Slice thicknes - Image reconstruction - K-space - Decoding the signal - Fourier transformation(FT) 	<p>.data acquisition: spatial encoding</p> <ul style="list-style-type: none"> - Frequency encoding - Phase encoding - Slice encoding - Slice selection - Slice location - Slice thicknes - Image reconstruction - K-space - Decoding the signal <p>Fourier transformation(FT)</p>	<p>in person education lectures using d show (PowerPo software.</p>	<ul style="list-style-type: none"> • Short cuizze • Term exam • Final exam
9	2	<p>MRI image quality</p> <ul style="list-style-type: none"> -resolution -matrix size -field of view (FOV) 	<p>MRI image quality</p> <ul style="list-style-type: none"> -resolution -matrix size -field of view (FOV) 	<p>in person education lectures using d show (PowerPo software.</p>	<ul style="list-style-type: none"> • Short cuizze • Term exam • Final exam

		-slice thickness	-slice thickness		
10	2	Noise -noise sources -signal-to-noise ratio(SNR)considerate ns: types &factores	Noise -noise sources -signal-to-noise ratio(SNR)considerate ns: types &factores	in person education lectures using datashow (PowerPoint) software.	<ul style="list-style-type: none"> • Short cuizze • Term exam • Final exam
11	2	-artefacts: -motion-induced artifacts -radiofrequency artefacts -distortion artefacts -aliasing artefacts -sequence specific artefacts	-artefacts: -motion-induced artifacts -radiofrequency artefacts -distortion artefacts -aliasing artefacts -sequence specific artefacts	in person education lectures using datashow (PowerPoint) software.	<ul style="list-style-type: none"> • Short cuizze • Term exam • Final exam
12	2	-imaging methods: pulse sequences -spin echo pulse sequence -single;multi;and fast spin echo -inversion recovery sequences -short tau inversion recovery (STIR) -FLUID ATTENUATED INVERSION RECOVERY (FLAIR) -PHASE –SENSITIVE INVERSION RECOVERY(PSIR)	imaging methods: pulse sequences -spin echo pulse sequence -single;multi;and fast spin echo -inversion recovery sequences -short tau inversion recovery (STIR) -FLUID ATTENUATED INVERSION RECOVERY (FLAIR) -PHASE –SENSITIVE INVERSION RECOVERY(PSIR)	in person education lectures using datashow (PowerPoint) software.	<ul style="list-style-type: none"> • Short cuizze • Term exam • Final exam
13	2	-gradient echo sequences -coherent gradient echo -incoherent coherent gradient echo -steady state free precession	gradient echo sequences -coherent gradient echo -incoherent coherent gradient echo -steady state free precession	in person education lectures using datashow (PowerPoint) software.	<ul style="list-style-type: none"> • Short cuizze • Term exam • Final exam
14	2	-echo planar imaging (EPI)	echo planar imaging (EPI)	in person education lectures using datashow (PowerPoint) software.	<ul style="list-style-type: none"> • Short cuizze

		-hybrid fast imaging technique(GRASE)	-hybrid fast imaging technique(GRASE)	show (PowerPo software.	• Term exam • Final exam
15	2	-diffusion – weighted imaging	-diffusion – weighted imaging	in person education lectures using d show (PowerPo software.	• Short cuizze • Term exam • Final exam

213.Course Evaluation

- The exam is based on the CUSE system and semester exams

- Preparing brief reports for a student and presenting them in the form of a seminar, activity and participation within the lecture

Distribution of the score out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

214.Learning and Teaching Resources

Required textbooks (curricular books, any)	1- Stewart carlyle bushing ,Geoffrey Clarke “magnetic resonance imaging :physical and biological principles” , mosby ,inc,anaffil of Elsevier inc ,4 th edition 2o15
Main references (sources)	1-perry sprawls “magnetic resonance imaging ,principles , methods techniques” medical physics publishing Madison Wisconsin 2000
Recommended books and references (scientific journals, reports...)	Internet
Electronic References, Websites	Websites of magazines classified within Scopus, international publis houses, and international universities

Course Description Form

215. Course Name:	
Equipment Techniques of Ultrasound	
216. Course Code:	
RAD 310	
217. Semester / Year:	
Semester2/2025–2026	
218. Description Preparation Date:	
7/7/2025	
219. Available Attendance Forms:	
Theory/weekly	
220. Number of Credit Hours (Total) / Number of Units (Total)	
Experimental 3/Theoretical 2	
221. Course administrator's name (mention all, if more than one name)	
Name: MSC.Thalfaa Rasheed Ajeel Email: Thalfaa. Rasheed @ gau.edu.iq	
222. Course Objectives	
Course Objectives	<ul style="list-style-type: none"> • It consists of diagnosing and understanding mechanics and configuration of the device • The ability to use, examine and diagnose.....

223. Teaching and Learning Strategies

Strategy	<p>A- Cognitive objectives:</p> <p>--1 The student can understand the basic components of the device</p> <p>-2 The student can distinguish and diagnose the healthy and injured condition of the organ being examined</p> <p>3-The student can explain the mechanism of the resulting image</p> <p>4-The student can understand and write a report on this</p> <p>B - Skills objectives for the course:</p> <p>B1 - The student can solve problems related to the device</p> <p>B2 - The student can write the medical report</p> <p>B3 - The student can solve problems related to the organs inside the human body</p>
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224. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Historical Review ultrasound imaging	Historical Review ultrasound imaging	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
2&3	2	Fundamental physics ultrasound and interaction with tissues	Fundamental physics ultrasound and interaction with tissues	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
4&5	2	Transducers and beam forming	Transducers and beam forming	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
6	2	B-mode instrumentation	B-mode instrumentation	in person education lectures using computer show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam

				show (PowerPoint software).	<ul style="list-style-type: none"> • Term exam • Final exam
7&8	2	Properties, limitations and artefacts of B-mode imaging	Properties, limitations and artefacts of B-mode imaging	in person education lectures using Powerpoint show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
9	2	Principles of Doppler ultrasound	Principles of Doppler ultrasound	in person education lectures using Powerpoint show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
10	2	Colour flow and tissue imaging	Colour flow and tissue imaging	in person education lectures using Powerpoint show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
11	2	Quality assurance	Quality assurance	in person education lectures using Powerpoint show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
12	2	3D ultrasound	3D ultrasound	in person education lectures using Powerpoint show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
13	2	Contrast agents	Contrast agents	in person education lectures using Powerpoint show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
14	2	Safety of diagnostic ultrasound	Safety of diagnostic ultrasound	in person education lectures using Powerpoint show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
15	2	Final Examination	Final Examination	in person education lectures using Powerpoint show (PowerPoint software).	<ul style="list-style-type: none"> • Short quizzes • Term exam • Final exam
225. Course Evaluation					

- The exam is based on the CUSE system and semester exams

- Preparing brief reports for a student and presenting them in the form of a seminar, activity and participation within the lecture

Distribution of the score out of 50 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.

226. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<p>1. Medical physics / John R. Cameron and James G. (Skofroni Peter R. Hoskins, Kevin Martin, Abigail Thrush, "Diagnostic Ultrasound: Physics and Equipment", Cambridge University P , (2010)</p> <p>. 2. Andreas Maier • Stefan Steidl, "Medical Imaging Systems Introductory Guide", Springer, (1973).</p> <p>3. D.R. Dance, S. Christofides, A.D.A. Maidment, I.D. McLean K.H. Ng "Diagnostic Radiology Physics", International atomic energy agency, Vienna,(2014).</p>
Main references (sources)	<p>. 1. Peter R. Hoskins, Kevin Martin, Abigail Thrush, "Diagn Ultrasound: Physics and Equipment", Cambridge University (, (2010).</p> <p>2. Andreas Maier • Stefan Steidl, "Medical Imaging Syst Introductory Guide", Springer, (1973).</p> <p>3. D.R. Dance, S. Christofides, A.D.A. Maidment, I.D. McLean, Ng "Diagnostic Radiology Physics", International atomic er agency, Vienna,(2014).</p>
Recommended books and references (scientific journals, reports...)	Internet
Electronic References, Websites	Websites of magazines classified within Scopus, internat publishing houses, and international universities

Weeks	Details
1	Historical Review of ultrasound imaging
2 & 3	Fundamental physics of ultrasound and interaction with tissues

4 & 5	Transducers and beam-forming
6	B-mode instrumentation
7 & 8	Properties, limitations and artefacts of B-mode images
9	Principles of Doppler ultrasound
10	Colour flow and tissue imaging
11	Quality assurance
12	3D ultrasound
13	Contrast agents
14	Safety of diagnostic ultrasound
15	Final Examination

Course Description Form

227.	Course Name:
General pathology	
228.	Course Code:
229.	Semester / Year:
Autumn semester	
230.	Description Preparation Date:
June 2025	
231.	Available Attendance Forms: official full attendance
232.	Number of Credit Hours (Total) / Number of Units (Total)
30 hours	
233.	Course administrator's name (mention all, if more than one name)
Dr. mohammed, mohammed	
234.	Course Objectives
<p>The objectives of a general pathology course typically revolve around understanding the fundamental mechanisms of disease development and progression at the cellular, tissue, and systemic levels. This includes exploring the causes, mechanisms, and effects of various diseases, as well as the body's responses to them. Students will learn about cell injury, cell death, inflammation, healing, immune responses, and neoplasia. Furthermore, the course aims to equip students with the ability to relate these basic pathological processes to common and important diseases.</p>	
235.	Teaching and Learning Strategies
<p>The overarching learning objective for general pathology is to understand the fundamental mechanisms of disease, encompassing cellular, tissue, and organ-level changes caused by injury or disease. This includes grasping the etiology (cause) and</p>	

pathogenesis (development) of various pathological processes. Students should be able to correlate these pathological changes with clinical manifestations, laboratory findings, and ultimately, contribute to diagnosis and treatment.

236. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation methods
1	2	Study of hypertrophy, hyperplasia, atrophy and metaplasia	Cell adaptation	integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	techniques used to assess tissue and cellular changes in disease. These include gross examination, microscopy (histopathology), immunohistochemistry, and molecular techniques like PCR and sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
2	2	Study of cardinal signs of inflammation and vascular and cellular changes	Acute inflammation	integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy (histopathology), immunohistochemistry, and molecular techniques like PCR and sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized

3	2	Study of signs and types	Chronic Inflammation	integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy , analysis (histopathology, immunohistochemistry, and molecular techniques like PCR and sequencing). Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
4	2	Cell changes: Reversible changes		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy , analysis (histopathology, immunohistochemistry, and molecular techniques like PCR and sequencing). Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
5	2	Irreversible cell changes: Necrosis and Apoptosis		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy , analysis (histopathology, immunohistochemistry, and molecular techniques like PCR and sequencing). Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized

6	2	Repair, healing & Regeneration		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy (histopathology), immunohistochemistry, and molecular techniques like PCR and sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
7	2	Criteria used for cytopathological diagnosis of cancer		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy (histopathology), immunohistochemistry, and molecular techniques like PCR and sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
8	2	Changes in the cytoplasm in malignancy Changes in the nucleus in malignancy		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy (histopathology), immunohistochemistry, and molecular techniques like PCR and sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized

9	2	Changes in cell as a general in malignancy		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy , analysis (histopathology), immunohistochemistry, and molecular techniques like PCR and sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
10	2	Nomenclature of tumors		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy , analysis (histopathology), immunohistochemistry, and molecular techniques like PCR and sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
11	2	Classification of tumors		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy , analysis (histopathology), immunohistochemistry, and molecular techniques like PCR and sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
12	2	Hemodynamic changes		integrating various active learning techniques, leveraging digital	These include gross examination, microscopy , analysis (histopathology), immunohistochemistry,

				resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	and molecular techniques like PCR sequencing . Additional diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
13	2	Hemodynamic changes		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy , analysis (histopathology), immunohistochemistry, and molecular techniques like PCR sequencing . Additional diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
14	2	Hemodynamic changes		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy , analysis (histopathology), immunohistochemistry, and molecular techniques like PCR sequencing . Additional diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
15	2	Revesion			

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	Hours
1	Hypertrophy- Slide demonstration	Slide demonstration

2	Hyperplasia- Slide demonstration	Slide demonstration
3	Atrophy- slide demonstration	Slide demonstration
4		
5	Metaplasia- slide demonstration	Slide demonstration
6	Dysplasia- slide demonstration	Slide demonstration
7	Acute inflammation- slide demonstration	Slide demonstration
8	Chronic inflammation- slide demonstration	Slide demonstration
9	Tissue repair- slide demonstration	Slide demonstration
10	Bone fracture repair- slide demonstration	Slide demonstration
12	Epithelial tumors- slide demonstration	Slide demonstration
13	Connective tissue tumors- slide demonstration	Slide demonstration
14	Tumor staging	Slide demonstration
15	Revision	

<p>15. Course evaluation weekly examination reports Homeworks</p>	
<p>16. Learning and Teaching Resources</p>	
<p>Required textbooks (curricular books, if any)</p> <p>1-Atlas of pathology , 3rd edition</p> <p>2- Robins and Cotran – Atlas of Pathology</p> <p>3- Robin pathology</p> <p>4- Diagnostic techniques for cancer</p> <p>5- Manual of Cytology</p> <p>6-Carson, Freida L; Christa Hladik (2009). Histotechnology: A Self-Instructional Text (3rd ed. Hong Kong.</p>	
<p>Main references (sources)</p> <p>1-Atlas of pathology , 3rd edition</p>	

<p>2- Robins and Cotran – Atlas of Pathology</p> <p>3- Robin pathology</p> <p>4- Diagnostic techniques for cancer</p> <p>5- Manual of Cytology</p> <p>6-Carson, Freida L; Christa Hladik (2009). Histotechnology: A Self-Instructional Text (3rd ed. Hong Kong.</p>	
<p>Recommended books and references (scientific journals, reports...)</p> <p>Internet supply</p> <ul style="list-style-type: none"> - Webpathology - Virtual microscopy laboratory - Pathology outlines.com - Diagnostic histopathology: Homepage 	
<p>Electronic References, Websites</p> <p>Internet supply</p> <ul style="list-style-type: none"> - Webpathology - Virtual microscopy laboratory - Pathology outlines.com - Diagnostic histopathology: Homepage 	

Here is the completed Course Description Form for Physics of Magnetic Resonance:

Course Description Form : Physics of Magnetic Resonance (فيزياء الرنين المغناطيسي)

Field	Details
1. Course Name	Physics of Magnetic Resonance Imaging (فيزياء الرنين المغناطيسي)
2. Course Code	(To be filled by institution)
3. Semester / Year	Third Stage / First Semester
4. Description Preparation Date	(To be filled by institution)
5. Available Attendance Forms	Official full attendance
6. Credit Hours / Units	4 hours (1 theoretical + 3 practical) / 2 units
7. Course Administrator(s)	(To be filled by institution)
8. Course Objectives	<ol style="list-style-type: none"> 1. Explain MRI concepts and scanner components. 2. Describe principles of nuclear magnetic resonance. 3. Analyze tissue magnetization (T1/T2 relaxation). 4. Define TR/TE and their impact on image weighting. 5. Compare T1, T2, and proton density-weighted images. 6. Discuss magnetic susceptibility and contrast agents. 7. Demonstrate NMR spectroscopy basics.
9. Teaching Strategies	Lectures, lab simulations, case studies, assignments, weekly exams.
10. Course Structure (Weekly Breakdown)	See table below.
11. Practical Sessions	RF pulse simulations, relaxation time measurements, image weighting labs, contrast agent experiments.
12. Evaluation Methods	Weekly quizzes, lab reports, final exam.
13. Required Textbooks	<ol style="list-style-type: none"> 1. Sprawls (2000). <i>MRI Principles</i>. 2. Al-Qurayshi & AL-Mosawi (2015).

Field	Details
	3. Hendee & Ritenour (2002). 4. Allisy-Roberts & Williams (2007).
14. Recommended Resources	Scientific journals, MRI manufacturer manuals (e.g., Siemens, GE).

Weekly Course Structure

Week	Hours	Learning Outcomes	Unit/Subject	Teaching Method	Evaluation
1	1	Explain magnetism in MRI.	Magnetism, nuclear magnetic resonance.	Lecture + diagrams	Quiz
2	1	Describe proton spin properties.	Magnetic momentum, tissue elements.	Interactive demo	Lab report
3	1	Apply RF pulses in MRI.	Excitation, inversion, refocusing.	Simulation software	Assignment
4	1	Analyze nuclear alignment.	Precession, resonance, relaxation.	Case studies	Quiz
5	1	Calculate Larmor frequency.	Field strength, chemical shift.	Problem-solving	Exam
6	1	Illustrate tissue magnetization.	Flip angles, 90° pulse.	Lab experiment	Report

Week	Hours	Learning Outcomes	Unit/Subject	Teaching Method	Evaluation
7	1	Compare T1 relaxation factors.	T1-weighted images.	Group discussion	Quiz
8	1	Distinguish T2 relaxation.	T2-weighted images, FID.	Lab demo	Exam
9	1	Explain T2* effects.	T1 vs. T2 values.	Lecture + charts	Quiz
10	1	Classify magnetic materials.	Contrast agents (paramagnetic, etc.).	Case analysis	Report
11	1	Measure T1/T2 times.	Saturation/inversion recovery.	Lab tools	Exam
12	1	Interpret PD/T1/T2 images.	Tissue characteristics.	Image analysis	Quiz
13	1	Evaluate fluid movement.	Diffusion, perfusion.	Simulation	Report
14	1	Demonstrate NMR spectroscopy.	Chemical shift imaging.	Lab session	Exam
15	1	Optimize TR/TE parameters.	Imaging cycle, echo signals.	Case study	Final exam

Practical Sessions

Week	Hours	Activity	Outcome
1-3	3	RF pulse simulations.	Master excitation protocols.
4-6	3	Relaxation time measurements.	Calculate T1/T2 in phantoms.
7-9	3	Image weighting labs.	Generate T1/T2/PD-weighted images.
10-12	3	Contrast agent experiments.	Observe susceptibility effects.
13-15	3	TR/TE optimization.	Adjust parameters for image contrast.

Course Description Form

237. Course Name:
Physics of Ultrasound
238. Course Code:
RAD 316
239. Semester / Year:
2 nd semester 2024 – 2025
240. Description Preparation Date:
1 / 10 / 2024
241. Available Attendance Forms: official full attendance
Presence
242. Number of Credit Hours (Total) / Number of Units (Total)
2 hours per week / 30 hours for the entire course - 3 units
243. Course administrator's name (mention all, if more than one name)
Lecturer Dr. Naseer Mahdi Hadi - e mail: Naseer.m.hadi@gu.edu.iq
244. Course Objectives
<u>Course Objectives</u>

1. Describe the basic physical properties of an ultrasound pulse that influence its imaging characteristics.
2. Describe the basic function of a transducer and how it shapes the ultrasound pulse.
3. Describe the general relationship between wavelength and image quality.
4. Describe the factors that determine the intensity of the reflected pulse.
5. State the physical and medical definition of ultrasound.
6. Explain how a piezoelectric actuator operates.
7. Identify the properties of ultrasound.
8. Briefly describe piezoelectric materials.
9. Explain the piezoelectric effect and the inverse piezoelectric effect.

245. Teaching and Learning Strategies

- 1- Theoretical/through scientific lectures
- 2- Practical/through practical lectures in the hospital.

246. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understands the subject matter	Nature and Properties of Ultrasound Waves	Lectures Data show	Quiz
2	2	Understands the subject matter	Production of Ultrasound Waves	Lectures Data show	Quiz
3	2	Understands the subject matter	Propagation and Interaction of Ultrasound Waves with Materials	Lectures Data show	Quiz
4	2	Understands the subject matter	Speed of Sound, Acoustic Impedance, and Attenuation Coefficient	Lectures Data show	Quiz
5	2	Understands the subject matter	Standing Waves and Resonance	Lectures Data show	Quiz
6	2	Understands the subject matter	Scattering of Ultrasonic Waves	Lectures Data show	Quiz

7	2	Understands the subject matter	Piezoelectric Effect	Lectures Data show	Quiz
8	2	Understands the subject matter	Piezoelectric Effect	Lectures Data show	Quiz
9	2	Understands the subject matter	Design and Construction of Ultrasonic Transducers	Lectures Data show	Quiz
10	2	Understands the subject matter	Design and Construction of Ultrasonic Transducers	Lectures Data show	Quiz
11	2	Understands the subject matter	Pulsed and Continuous Ultrasound	Lectures Data show	Quiz
12	2	Understands the subject matter	Beam Shape from a Single Transducer and Ring-Array Transducers	Lectures Data show	Quiz
13	2	Understands the subject matter	Doppler Effect	Lectures Data show	Quiz
14	2	Understands the subject matter	Doppler Effect	Lectures Data show	Quiz
15	2	Understands the subject matter	Final Examination	Lectures Data show	Quiz

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	hours
1		
2		
3		
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15		

17. Course evaluation	
The grade is distributed out of 100 based on the student's assigned tasks, such as daily preparation, daily, oral, monthly, written exams, reports, and the final exam, as follows: The monthly exam grade is 40 points = 20 theoretical + 20 practical The final ministerial exam grade is 60 points = 40 theoretical + 20 practical	
18. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	-----
Main references (sources)	<ol style="list-style-type: none"> 1. M. Radhi Al-Qurayshi and H. Qasim. AL-Mosawi "<i>Radiation Physics and its applications in diagnostic radiological techniques</i>", Middle Technical University (MTU), Iraq, (2015). 2. Peter Hoskins, Kevin Martin, Abigail Thrush, <i>Diagnostic Ultrasound: Physics and Equipment</i>", Second Edition, Cambridge university press, New York, 2010.
Recommended books and references (scientific journals, reports...)	<ol style="list-style-type: none"> 1. Stewart C. Bushong ScD FAAPM FACR - Radiologic Science for Technologists_ Physics, Biology, and Protection-Mosby (2016) 2. Chris Guy, Dominic Ffytche - An introduction to the principles of medical imaging-Imperial College Press_ Distributed by World Scientific Pub (2005)
Electronic References, Websites	Lectures and Reports from Internet and YouTube

Course Description Form

247. Course Name:	Radiographic techniques for head & spinal cord
248. Course Code:	XUT35224
249. Semester / Year:	1 st semester \ 2025
250. Description Preparation Date	15-7-2025
251. Available Attendance Forms:	official full attendance

personally					
252. Number of Credit Hours (Total) / Number of Units (Total)					
90 hours- 120 units					
253. Course administrator's name (mention all, if more than one name)					
Teaching assistant – Hiba othman Mohammed					
Technicians Summaia Bassem					
254. Course Objectives					
Course Objectives					
Provide a concise of the main procedure of the radiographic techniques to the head & spinal cords to assess different cases & to diagnose different projections that used in each cases ,patient preparation, position of x-ray tube which made the students have the knowledge of all aspects of the specialty					
255. Teaching and Learning Strategies					
Theoretical & practical					
256. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Knowledge of the main radiographic techniques of skull	Landmarks of skull	Lectures & x-ray films	Daily exam final exam
2	3	Knowledge of the main radiographic techniques of skull	Lines of skull	Lectures & x-ray films	Daily exam- final exam
3	3	Knowledge of the main radiographic techniques of skull	Planes of skull	Lectures & x-ray films	final exam-Daily exam
4	3	Knowledge of the main radiographic techniques of head	Head projections	Lectures & x-ray films	Daily exam-final exam

5	3	Knowledge of the main radiographic techniques of skull	Skull AP , Lateral ,townes and basal views	Lectures & x-ray films	final exam-Daily exam
6	3	Knowledge of the main radiographic techniques of skull	Radiographic techniques of skull	Lectures & x-ray films	Daily exam-Final exam
7	3	Knowledge of the main radiographic techniques of skull	Radiographic techniques of skull	Lectures & x-ray films	final exam-Daily exam
8	3	Knowledge of the main radiographic techniques of Sinuses, face , and nose PA and lateral projection , shown structure	Sinuses, face , and nose PA and lateral projection , shown structure	Lectures & x-ray films	Daily exam- Final exam
9	3	Knowledge of the main radiographic techniques of Paranasal sinuses, waters view & lateral view, shown structure main finding	Paranasal sinuses, waters view & lateral view, shown structure main finding	Lectures & x-ray films	final exam-Daily exam
10	3	Knowledge of the main radiographic techniques of Mandible PA and oblique projection, shown structure, main finding	Mandible PA and oblique projection, shown structure, main finding	Lectures & x-ray films	Daily exam-Final exam
11	3	Knowledge of the main radiographic techniques of Cervical spine ,AP , lateral , AP for C1-C3 , AP view for C3- C7, shown structure	Cervical spine ,AP , lateral , AP for C1- C3 , AP view for C3- C7, shown structure	Lectures & x-ray films	final exam-Daily exam
12	3	Knowledge of the main radiographic techniques of Thoracic spine , AP , Lateral, lateral decubitus , shown structure	Thoracic spine , AP , Lateral, lateral decubitus , shown structure	Lectures & x-ray films	Daily exam-final exam
13	3	Knowledge of the main radiographic techniques of Lumber spine , AP , Lateral ,oblique projection, shown structure	Lumber spine , AP , Lateral ,oblique projection, shown structure	Lectures & x-ray films	final exam-Daily exam
14	3	Knowledge of the main radiographic techniques of Sacrum and coccyx , AP ,	Sacrum and coccyx , AP , lateral , shown	Lectures & x-ray films	Daily exam-final exam

		lateral , shown structure, main finding	structure, main finding		
15	3	Knowledge of the main Radiological considerations	Radiological considerations	Lectures & x-ray films	final exam-Daily exam

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	hours
1	Landmarks of skull	3
2	Lines of skull	3
3	Planes of skull	3
4		3
5	Head projections	3
6	Skull AP , Lateral ,townes and basal views	3
7	Radiographic techniques of skull	3
8	Radiographic techniques of skull	3
9	Sinuses, face , and nose PA and lateral projection , shown structure	3
10	Paranasal sinuses, waters view & lateral view, shown structure main finding	3
12	Mandible PA and oblique projection, shown structure, main finding	3
13	Cervical spine ,AP , lateral , AP for C1-C3 , AP view for C3- C7, shown structure	3
14	Thoracic spine , AP , Lateral, lateral decubitus , shown structure	3
15	Lumber spine , AP , Lateral ,oblique projection, shown structure	3

19. Course evaluation

weekly examination
reports
Homeworks

20. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	

Electronic References, Websites	
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Course Description Form

257.	Course Name: Radiographic Techniques of Thorax & abdomen
258.	Course Code: XUT36232
259.	Semester / Year: 2 nd -2025
260.	Description Preparation Date:
15-7-2025	
261.	Available Attendance Forms: official full attendance
personally	
262.	Number of Credit Hours (Total) / Number of Units (Total)
90 hours – 120 units	
263.	Course administrator's name (mention all, if more than one name)
Teaching assistant – Hiba othman Mohammed	
Technicians Summia Bassem	
264.	Course Objectives
<p>Course Objectives</p> <p>Provide a concise of the main procedure of the radiographic techniques to the thorax & abdomen to assess different cases & to diagnose different projections that used in each cases ,patient preparation, position of the x-ray tube which made the student have the knowledge of all aspects of the specialty</p>	

265. Teaching and Learning Strategies

Theoretical & practical

266. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Knowledge of the main radiographic techniques of Larynx& pharynx	Larynx& pharynx	Lectures & x-ray films	Daily exam-final exam
2	3	Knowledge of the main radiographic techniques of lungs	Lungs	Lectures & x-ray films	Daily exam-final exam
3	3	Knowledge of the main radiographic techniques of Lungs , AP ,lateral , apical view , shown structure, interpretation system, lordotic position	Lungs , AP ,lateral , apical view , shown structure, interpretation system, lordotic position	Lectures & x-ray films	Daily exam-final exam
4	3	Knowledge of the main radiographic techniques of Heart and aorta, main branches	Heart and aorta, main branches	Lectures & x-ray films	Daily exam-final exam
5	3	Knowledge of the main radiographic techniques of Bones of the thorax (upper ribs)	Bones of the thorax (upper ribs)	Lectures & x-ray films	Daily exam-final exam
6	3	Knowledge of the main radiographic techniques of Bones of the thorax (lower ribs)	Bones of the thorax (lower ribs)	Lectures & x-ray films	Daily exam-final exam
7	3	Knowledge of the main radiographic techniques of Sternum	Sternum	Lectures & x-ray films	Daily exam-final exam

8	3	Knowledge of the main radiographic techniques of Abdomen Planes & regions and Image parameters, Abdomen , AP supine, PA erect , lateral view positions	Abdomen Planes & regions and Image parameters, Abdomen , AP supine, PA erect , lateral view positions	Lectures & x-ray films	Daily exam-final exam
9	3	Knowledge of the main radiographic techniques of Abdomen Planes & regions and Image parameters, Abdomen , AP supine, PA erect , lateral view positions	Abdomen Planes & regions and Image parameters, Abdomen , AP supine, PA erect , lateral view positions	Lectures & x-ray films	Daily exam-final exam
10	3	Knowledge of the main radiographic techniques of urinary tract	Urinary tract	Lectures & x-ray films	Daily exam-final exam
11	3	Knowledge of the main radiographic techniques of urinary tract	Urinary tract	Lectures & x-ray films	Daily exam-final exam
12	3	Knowledge of the main radiographic techniques of kidneys	kidneys	Lectures & x-ray films	Daily exam-final exam
13	3	Knowledge of the main radiographic techniques of Ureters	ureters	Lectures & x-ray films	Daily exam-final exam
14	3	Knowledge of the main radiographic techniques of	Urinary bladder	Lectures & x-ray films	Daily exam-final exam
15	3	Knowledge of the main radiographic techniques of Mammography, main position, finding, image interpretation	Mammography, main position, finding, image interpretation	Lectures & x-ray films	Daily exam-final exam

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	hours
1		
2		
3		
4		
5		
6		

7		
8		
9		
10		
12		
13		
14		
15		

21. Course evaluation weekly examination reports Homeworks	
22. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

267. Course Name:
Radiological Anatomy of brain and spinal cord
268. Course Code:
RAD 301
269. Semester / Year:

2024_2025
270. Description Preparation Date:
2025\7\20
271. Available Attendance Forms: official full attendance
Attendance
272. Number of Credit Hours (Total) / Number of Units (Total)
2 hour theory+2 hour practical =4 hour weekly \Total Hour =60 hour\3 point
273. Course administrator's name (mention all, if more than one name)
Ph.D. Hawraa Abdulameer Kareem Email: dr.hawraa1987@gmail.com
274. Course Objectives:
To Know and Understand
1. Acquire basic knowledge of the organization and topography of the central nervous system.
2. Classify the parts and components of the central nervous system on plastic models and photographs for imaging techniques.
3. Predict the clinical significance of neuroanatomical structures.
4. Describe the radiological and imaging anatomy of the brain and spinal cord.
5. Establish a working knowledge of cross-sectional anatomy.
275. Teaching and Learning Strategies
Formal lectures, interactive tutorials, and practical laboratory lessons.
1- Theoretical/through scientific lectures.
2- Practical/through practical lectures and hospital application.
276. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understands the subject matter	Brain : Cerebral hemispheres,Cerebral cortex	Lectures data show	Quiz
2	2	Understands the subject matter	White matter in both hemispheres,Thalamus, hypothalamus, and pineal gland	Lectures data show	Quiz
3	2	Understands the subject matter	Pituitary gland, Limbic lobe	Lectures data show	Quiz
4	2	Understands the subject matter	Brainstem and cerebellum	Lectures data show	Quiz
5	2	Understands the subject matter	Ventricles, cisterns, cerebrospinal fluid production, and outflow ventricles.	Lectures data show	Quiz
6	2	Understands the subject matter	Meninges.Arterial,supplies to the brain.Internal carotid artery.	Lectures data show	Quiz
7	2	Understands the subject matter	MID-TERM EXAM	Lectures data show	Quiz
8	2	Understands the subject matter	Cerebral Venous Drainage	Lectures data show	Quiz
9	2	Understands the subject matter	The Spine, .The Spinal Joints	Lectures data show	Quiz
10	2	Understands the subject matter	The Spinal Ligaments. The Intervertebral Discs	Lectures data show	Quiz
11	2	Understands the subject matter	Blood supply of the spine.Spinal cord.	Lectures data show	Quiz

12	2	Understands the subject matter	Spinal meninges.Blood supply of the spinal cord	Lectures data show	Quiz
13	2	Understands the subject matter	Related MRI anatomy - Cervical spine	Lectures data show	Quiz
14	2	Understands the subject matter	Related MRI anatomy - Dorsolumbar spine	Lectures data show	Quiz
15	2	Understands the subject matter	Overview	Lectures data show	Quiz

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	hours
1	Brain : Cerebral hemispheres: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
2	Thalamus, hypothalamus, and pineal gland anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
3	Pituitary gland, Limbic lobe :anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
4	Brainstem and cerebellum :anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
5	Ventricles, cerebrospinal fluid production, and outflow ventricles: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
6	Meninges. Arterial supplies to the brain. Internal carotid artery:anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
7	MID-TERM EXAM	2
8	Cerebral Venous Drainage: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
9	The Spine and The Spinal Joints: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2

10	The Spinal Ligaments and The Intervertebral Discs: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
11	Blood supply of the spine and Spinal cord: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
12	Spinal meninges and Blood supply of the spinal cord: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
13	Related MRI anatomy - Cervical spine: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
14	Related MRI anatomy - Dorsolumbar spine: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
15	Overview	2

23. Course evaluation

4. weekly examination
5. reports
6. Home works

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

1- Snell R (2010): Clinical Neuroanatomy. 8th Ed. Lippincott Williams & Wilkins. Philadelphia.

2- Sarah McWilliams: practical radiological anatomy. © 2011 by Taylor & Francis Group LLC.

Recommended books and references (scientific journals, reports...)	6. MRI of the brain and spine (CD) 7. McMinn's colour atlas of human anatomy (CD) 8. McMinn & Abrahams's clinical atlas of human anatomy (CD) 9. Weir J & Abrahams P: Imaging atlas of the human body (CD) 10. Netter's Interactive Anatomy (CD) 6. Grant's atlas of anatomy (CD)
Electronic References, Websites	Lectures and reports from the Internet and YouTube

Course Description Form

277. Course Name:	Radiological Anatomy of Chest and Abdomen
278. Course Code:	RAD 308
279. Semester / Year:	2024_2025
280. Description Preparation Date:	2025\7\20
281. Available Attendance Forms: official full attendance	Attendance
282. Number of Credit Hours (Total) / Number of Units (Total)	2 hour theory+2 hour practical =4 hour weekly \Total Hour =60 hour\3 point
283. Course administrator's name (mention all, if more than one name)	Ph.D. Hawraa Abdulameer Kareem Email: dr.hawraa1987@gmail.com
284. Course Objectives:	Provide basic knowledge about the organization of abdominal and thoracic anatomy.

- Highlight the clinical significance of abdominal and thoracic anatomy.
- Describe the radiological anatomy of abdominal and thoracic anatomy.

A– Cognitive Objectives

A1. Acquire basic knowledge about the organization and topography of abdominal and thoracic anatomy.

A2. Classify the parts and components of the lower extremities on plastic models and images for imaging techniques.

A3. Predict the clinical significance of neuroanatomical structures.

A4. Describe the radiological and imaging anatomy of the abdomen and thorax.

A5. Establish a working knowledge of cross-sectional anatomy.

B – Course-specific skill objectives.

B1. Demonstrate surface features of anatomical structures of the abdomen and thorax.

B2. Demonstrate a working knowledge of cross-sectional anatomy of the abdomen and thorax and related applications.

B3. Demonstrate a working knowledge of cross-sectional and radiological abdominal and thorax anatomy.

285. Teaching and Learning Strategies

Formal lectures, interactive tutorials, and practical laboratory lessons.

1- Theoretical/through scientific lectures.

2- Practical/through practical lectures and hospital application.

286. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understands the subject matter	Bones of the chest	Lectures data show	Quiz
2	2	Understands the subject matter	Respiratory system	Lectures data show	Quiz
3	2	Understands the subject matter	The radiological anatomy of Pleura	Lectures data show	Quiz

4	2	Understands the subject matter	Mediastinum	Lectures data show	Quiz
5	2	Understands the subject matter	The bronchial tree	Lectures data show	Quiz
6	2	Understands the subject matter	Anatomy of GIT	Lectures data show	Quiz
7	2	Understands the subject matter	MID-TERM EXAM	Lectures data show	Quiz
8	2	Understands the subject matter	Radiological anatomy the abdomen	Lectures data show	Quiz
9	2	Understands the subject matter	Arterial supply of the abdomen	Lectures data show	Quiz
10	2	Understands the subject matter	Urinary system	Lectures data show	Quiz
11	2	Understands the subject matter	Genital system	Lectures data show	Quiz
12	2	Understands the subject matter	Liver and Pancreas	Lectures data show	Quiz
13	2	Understands the subject matter	Blood supply of the chest and abdomen	Lectures data show	Quiz
14	2	Understands the subject matter	Relevant MRI anatomy -of the chest and abdomen	Lectures data show	Quiz
15	2	Understands the subject matter	Overview	Lectures data show	Quiz

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	hours
1	Bones of the chest: Cerebral hemispheres: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
2	Respiratory system: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
3	The radiological anatomy of Pleura: anatomical landmarks, ability to recognize normal and abnormal	2

	anatomical structures on different imaging modalities	
4	Mediastinum: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
5	The bronchial tree: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
6	Anatomy of GIT: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
7	MID-TERM EXAM	2
8	Radiological anatomy the abdomen : anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
9	Arterial supply of the abdomen: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
10	Urinary system: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
11	Genital system: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
12	Liver and Pancreas: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
13	Blood supply of the chest and abdomen: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
14	Relevant MRI anatomy -of the chest and abdomen: anatomical landmarks, ability to recognize normal and abnormal anatomical structures on different imaging modalities	2
15	Overview	2

25. Course evaluation

7. weekly examination
8. reports

9. Home works	
26. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	<p>1- Snell R (2010): Clinical Neuroanatomy. 8th Ed. Lippincott Williams & Wilkins. Philadelphia.</p> <p>2- Sarah McWilliams: practical radiological anatomy. © 2011 by Taylor & Francis Group LLC.</p>
Recommended books and references (scientific journals, reports...)	<p>11. MRI of the brain and spine (CD)</p> <p>12. McMinn's colour atlas of human anatomy (CD)</p> <p>13. McMinn & Abrahams's clinical atlas of human anatomy (CD)</p> <p>14. Weir J & Abrahams P: Imaging atlas of the human body (CD)</p> <p>15. Netter's Interactive Anatomy (CD)</p> <p>6. Grant's atlas of anatomy (CD)</p>
Electronic References, Websites	Lectures and reports from the Internet and YouTube

Course Description Form

287. Course Name:	Special Radiological Procedures of the cardiovascular and central nervous system
288. Course Code:	XUT36233
289. Semester / Year:	

2nd semester / 2025

290. Description Preparation Date:

15-7-2025

291. Available Attendance Forms: official full attendance

personally

292. Number of Credit Hours (Total) / Number of Units (Total)

90 hours/ 120 units

293. Course administrator's name (mention all, if more than one name)

Teaching assistant - Hiba othman Mohammed

294. Course Objectives

Course Objectives

Provide a concise of the main procedure of the special radiographic procedures of cardiovascular and central nervous system , to assess different cases & to diagnose different images in different techniques that used in each cases ,patient preparation, which made the students have the knowledge of all aspects of the specialty

295. Teaching and Learning Strategies

296. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Knowledges of imaging of the heart and angiocardigraphy	Imaging of the heart and angiocardigraphy	Lectures & imaging pictures	Daily exam- final exam

2	3	Knowledges of imaging of the heart and angiocardiology by Echocardiography (Echo)	Echocardiography (Echo)	Lectures & imaging pictures	Daily exam- final exam
3	3	Knowledges of imaging of the heart and angiocardiology by Electrocardiography-Gated Computed Tomography (CT)	Electrocardiography-Gated Computed Tomography (CT)	Lectures & imaging pictures	Daily exam- final exam
4	3	Knowledges of imaging of the heart and angiocardiology by Magnetic Resonance Imaging (MRI) of the Heart (Cardiac MRI)	Magnetic Resonance Imaging (MRI) of the Heart (Cardiac MRI)	Lectures & imaging pictures	Daily exam- final exam
5	3	Knowledges of imaging of the heart and angiocardiology by Nuclear Cardiology (Radionuclide Imaging)	Nuclear Cardiology (Radionuclide Imaging)	Lectures & imaging pictures	Daily exam- final exam
6	3	Knowledges of Femoral, Brachial, and Axillary Punctures for Catheterization	Femoral, Brachial, and Axillary Punctures for Catheterization	Lectures & imaging pictures	Daily exam- final exam
7	3	Knowledges of . Femoral Artery Puncture	. Femoral Artery Puncture	Lectures & imaging pictures	Daily exam- final exam
8	3	Knowledges of Brachial Artery Puncture	Brachial Artery Puncture	Lectures & imaging pictures	Daily exam- final exam
9	3	Knowledges of Axillary Artery Puncture	Axillary Artery Puncture	Lectures & imaging pictures	Daily exam- final exam
10	3	Knowledges of Ascending Aortography and Lower Limb Arteriography	Ascending Aortography and Lower Limb Arteriography	Lectures & imaging pictures	Daily exam- final exam
11	3	Knowledges of CT Angiography (CTA)	CT Angiography (CTA)	Lectures & imaging pictures	Daily exam- final exam
12	3	Knowledges of MRI Angiography (MRA) – Detailed Overview	MRI Angiography (MRA) – Detailed Overview	Lectures & imaging pictures	Daily exam- final exam

13	3	Knowledges of imaging by Doppler Ultrasound (Duplex Ultrasound)	Doppler Ultrasound (Duplex Ultrasound)	Lectures & imaging pictures	Daily exam- final exam
14	3	Knowledges of imaging Computed Tomography Venography (CTV)	Computed Tomography Venography (CTV)	Lectures & imaging pictures	Daily exam- final exam
15	3	Knowledges of imaging of Magnetic Resonance Venography (MRV)	Magnetic Resonance Venography (MRV)	Lectures & imaging pictures	Daily exam- final exam

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	hours
1	Imaging of the heart and angiocardigraphy	3
2	Echocardiography (Echo)	3
3	Electrocardiography-Gated Computed Tomography (CT)	3
4		
4	Magnetic Resonance Imaging (MRI) of the Heart (Cardiac MRI)	3
5	Nuclear Cardiology (Radionuclide Imaging)	3
6	Femoral, Brachial, and Axillary Punctures for Catheterization	3
7	. Femoral Artery Puncture	3
8	Brachial Artery Puncture	3
9	Axillary Artery Puncture	3
10	Ascending Aortography and Lower Limb Arteriography	3
11	CT Angiography (CTA)	3
12	MRI Angiography (MRA) – Detailed overview	3
13	Doppler Ultrasound (Duplex Ultrasound)	3
14	Computed Tomography Venography (CTV)	3
15	Magnetic Resonance Venography (MRV)	3

27. Course evaluation

weekly examination
reports
Homeworks

28. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

297. Course Name:	Special Radiological Procedures of the head, breast, and respiratory system
298. Course Code:	XUT35225
299. Semester / Year:	1 st semester \ 2025
300. Description Preparation Date:	15-7-2025
301. Available Attendance Forms: official full attendance	personally
302. Number of Credit Hours (Total) / Number of Units (Total)	90 hours – 120 units
303. Course administrator's name (mention all, if more than one name)	Teaching assistant – Hiba othman Mohammed
304. Course Objectives	

Provide a concise of the main procedure of the special radiographic procedures of the head, breast, and respiratory system, to assess different cases & to diagnose different images in different techniques used in each cases, patient preparation, which made the students have the knowledge of all aspects of the specialty

305. Teaching and Learning Strategies

Theoretical & practical

306. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Knowledge of the Methods of Imaging the Brain	Method of Imaging the Brain	Lectures & imaging pictures	Daily exam- final exam
2	3	Knowledge of the Method of Imaging the Brain by CT	Imaging the Brain by C.T	Lectures & imaging pictures	Daily exam- final exam
3	3	Knowledge of the Method of Imaging the Brain by MRI	Imaging the Brain by MRI	Lectures & imaging pictures	Daily exam- final exam
4	3	Knowledge of the Methods of Imaging the spines	Methods of Imaging the Spine,	Lectures & imaging pictures	Daily exam- final exam
5	3	Knowledge of the Method of Cervical Myelography	Cervical Myelography	Lectures & imaging pictures	Daily exam- final exam
6	3	Knowledge of the Lumber Myelography	Lumber Myelography	Lectures & imaging pictures	Daily exam- final exam
7	3	Knowledge of the Method of Imaging the Salivary Glands	Methods of Imaging the Salivary Glands	Lectures & imaging pictures	Daily exam- final exam
8	3	Knowledge of the Method of Magnetic Resonance Imaging Sialography	Magnetic Resonance Imaging Sialography	Lectures & imaging pictures	Daily exam- final exam

9	3	Knowledge of the Method of sialography by CT imaging	sialography by CT imaging	Lectures & imaging pictures	Daily exam- final exam
10	3	Knowledge of the Method of Imaging Thyroid & Parathyroid glands with CT	Method of Imaging Thyroid & Parathyroid glands with CT	Lectures & imaging pictures	Daily exam- final exam
11	3	Knowledge of the Method of Imaging Thyroid & Parathyroid glands with MRI	Method of Imaging Thyroid & Parathyroid glands with MRI	Lectures & imaging pictures	Daily exam- final exam
12	3	Knowledge of the Method of Imaging the Breast & Mammary	Method of Imaging the Imaging of the Breast & Mammary	Lectures & imaging pictures	Daily exam- final exam
13	3	Knowledge of the Method of Imaging Respiratory System	Methods Imaging of Respiratory System	Lectures & imaging pictures	Daily exam- final exam
14	3	Knowledge of the CT of Respiratory System	CT of Respiratory System	Lectures & imaging pictures	Daily exam- final exam
15	3	Knowledge of the Method of	Methods of Methods of Imaging Pulmonary Embolism, Pulmonary Arteriography & PET- CT of the Respiratory System	Lectures & imaging pictures	Daily exam- final exam

Course description (practical)		
weeks	Laboratory sessions & Clinical requirements	hours
1	Method of Imaging the Brain	3
2	Imaging the Brain by C.T	3
3	Imaging the Brain by MRI	3
4	Methods of Imaging the Spine	
5	Cervical Myelography	3

6	Lumber Myelography	3
7	Methods of Imaging the Salivary Glands	3
8	Magnetic Resonance Imaging Sialography	3
9	sialography by CT imaging	3
10	Method of Imaging Thyroid & Parathyroid glands with CT	3
12	Method of Imaging Thyroid & Parathyroid glands with MRI	3
13	Methods of Imaging of Respiratory System	3
14	CT of Respiratory system	3
15	Methods of Methods of Imaging Pulmonary Embolism, Pulmonary Arteriography & PET- CT of the Respiratory System	3

29. Course evaluation

weekly examination
reports
Homeworks

30. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

307. Course Name:

Systemic pathology

308. Course Code:

309. Semester / Year:
Spring semester
310. Description Preparation Date:
June 2025
311. Available Attendance Forms: official full attendance
312. Number of Credit Hours (Total) / Number of Units (Total)
30 hours
313. Course administrator's name (mention all, if more than one name)
Dr. mohammed, mohammed
314. Course Objectives
The objectives of a systemic pathology course typically revolve around understanding the fundamental mechanisms of disease development and progression at the cellular, tissue, and systemic levels. This includes exploring the causes, mechanisms, and effects of diseases and the body's responses to them. Students will learn about cell injury and death, inflammation, immune responses, and neoplasia. Furthermore, the course aims to equip students with the skills to relate these basic pathological processes to common and important diseases.
315. Teaching and Learning Strategies
The overarching learning objective for general pathology is to understand the fundamental mechanisms of disease, encompassing cellular, tissue, and organ-level changes caused by injury or disease. This includes grasping the etiology (cause) and pathogenesis (development) of various pathological processes. Students should be able to correlate these pathological changes with clinical manifestations, laboratory findings, and ultimately, contribute to diagnosis and treatment.
316. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Lung Diseases .Congenital .Atelectasis .Acute Pulmonary Injury .Obstructive Pulmonary Disease .Vascular Pulmonary Diseases	Cell adaptation	integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	techniques used to assess tissue and cellular changes in disease. These include gross examination, microanalysis (histopathology), immunohistochemistry, and molecular techniques like PCR sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized
2	2	Lung Diseases .Congenital .Atelectasis .Acute Pulmonary Injury .Obstructive Pulmonary Disease .Vascular Pulmonary Diseases	Acute inflammation	integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microanalysis (histopathology), immunohistochemistry, and molecular techniques like PCR sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, and PET scans are also utilized

3	2	Lung Diseases .Congenital .Atelectasis .Acute Pulmonary Injury .Obstructive Pulmonary Disease .Vascular Pulmonary Diseases	Chronic Inflammation	integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microanalysis (histopathology), immunohistochemistry, and molecular techniques like PCR sequencing . Additional diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized
4	2	Lung Diseases .Congenital .Atelectasis .Acute Pulmonary Injury .Obstructive Pulmonary Disease .Vascular Pulmonary Diseases		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microanalysis (histopathology), immunohistochemistry, and molecular techniques like PCR sequencing . Additional diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized
5	2	Heart diseases .Heart Failure		integrating various active learning techniques, leveraging digital resources, and	These include gross examination, microanalysis (histopathology), immunohistochemistry, and molecular

		<p>.Congenital Heart Disease</p> <p>.Ischemic Heart Disease</p> <p>.Hypertensive Heart Disease</p> <p>.Valvular Heart Disease</p> <p>.Cardiomyopathy Heart Disease</p> <p>.Pericardium Heart Disease</p>		<p>focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable</p>	<p>techniques like PCR sequencing. Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized</p>
6	2	<p>.Heart Failure</p> <p>.Congenital Heart Disease</p> <p>.Ischemic Heart Disease</p> <p>.Hypertensive Heart Disease</p> <p>.Valvular Heart Disease</p> <p>.Cardiomyopathy Heart Disease</p> <p>.Pericardium Heart Disease</p>		<p>integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable</p>	<p>These include gross examination, microscopy, immunohistochemistry, and molecular techniques like PCR sequencing. Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized</p>
7	2	<p>.Heart Failure</p>		<p>integrating various active learning techniques, leveraging digital</p>	<p>These include gross examination, microscopy, immunohistochemistry</p>

		<p>.Congenital Heart Disease</p> <p>.Ischemic Heart Disease</p> <p>.Hypertensive Heart Disease</p> <p>.Valvular Heart Disease</p> <p>.Cardiomyopathy Heart Disease</p> <p>.Pericardium Heart Disease</p>		<p>resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable</p>	<p>and molecular techniques like PCR sequencing. Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized</p>
8	2	<p>.Heart Failure</p> <p>.Congenital Heart Disease</p> <p>.Ischemic Heart Disease</p> <p>.Hypertensive Heart Disease</p> <p>.Valvular Heart Disease</p> <p>.Cardiomyopathy Heart Disease</p> <p>.Pericardium Heart Disease</p>		<p>integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable</p>	<p>These include gross examination, microscopy, immunohistochemistry, and molecular techniques like PCR sequencing. Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized</p>
9	2	<p>Gastrointestinal Diseases</p>		<p>integrating various active learning techniques, leveraging digital</p>	<p>These include gross examination, microscopy, immunohistochemistry</p>

		<ul style="list-style-type: none"> -Diseases of Esophagus -Diseases of Stomach -Diseases of small/ large Bowel -Appendix 		resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	and molecular techniques like PCR sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized
10	2	Gastrointestinal Diseases <ul style="list-style-type: none"> -Diseases of Esophagus -Diseases of Stomach -Diseases of small/ large Bowel -Appendix 		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microscopy , immunohistochemistry , and molecular techniques like PCR sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized
11	2	Gastrointestinal Diseases <ul style="list-style-type: none"> -Diseases of Esophagus -Diseases of Stomach -Diseases of small/ large Bowel -Appendix 		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote	These include gross examination, microscopy , immunohistochemistry , and molecular techniques like PCR sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging

				memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	modalities like microscopy, MRI, PET scans are also utilized
12	2	Pancreas Diseases .Congenital .Inflammatory(Acute, Chronic, Cyst) .Neoplasm		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microanalysis (histopathology), immunohistochemistry, and molecular techniques like PCR sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized
13	2	Pancreas Diseases .Congenital .Inflammatory(Acute, Chronic, Cyst) .Neoplasm		integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable	These include gross examination, microanalysis (histopathology), immunohistochemistry, and molecular techniques like PCR sequencing . Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized

14	2	<p>Lower urinary tract diseases</p> <p>Lower urinary tract diseases</p> <ul style="list-style-type: none"> . Ureters Anomalies . Bladder Anomalies . Urethra Anomalies 		<p>integrating various active learning techniques, leveraging digital resources, and focusing on understanding fundamental concepts rather than rote memorization. Case-based learning, digital pathology, and competency-based assessments are also valuable</p>	<p>These include gross examination, microanalysis (histopathology), immunohistochemistry, and molecular techniques like PCR sequencing. Additionally, diagnostic microbiology, cytopathology, and various imaging modalities like microscopy, MRI, PET scans are also utilized</p>
15	2	<p>Lower urinary tract diseases</p> <p>Lower urinary tract diseases</p> <ul style="list-style-type: none"> . Ureters Anomalies . Bladder Anomalies . Urethra Anomalies 			

Course description (practical)		
Weeks	Laboratory sessions & Clinical requirements	Hours
1	Respiratory diseases pathology	Slide demonstration
2	Respiratory diseases pathology	Slide demonstration
3	Respiratory diseases pathology	Slide demonstration
4	Respiratory diseases pathology	
5	Cardiovascular system pathology	Slide demonstration
6	Cardiovascular system pathology	Slide demonstration
7	Cardiovascular system pathology	Slide demonstration
8	Cardiovascular system pathology	Slide demonstration
9	Digestive tract pathology	Slide demonstration

10	Digestive tract pathology	Slide demonstration
12	Digestive tract pathology	Slide demonstration
13	Pancreas pathology	Slide demonstration
14	Pancreas pathology	Slide demonstration
15	Lower urinary tract pathology	

31. Course evaluation

weekly examination
reports
Homeworks

32. Learning and Teaching Resources

Required textbooks (curricular books, if any)

- 1-Atlas of pathology , 3rd edition
- 2- Robins and Cotran – Atlas of Pathology
- 3- Robin pathology
- 4- Diagnostic techniques for cancer
- 5- Manual of Cytology
- 6-Carson, Freida L; Christa Hladik (2009).
Histotechnology: A Self-Instructional Text (3rd ed.
Hong Kong.

Main references (sources)

- 1-Atlas of pathology , 3rd edition
- 2- Robins and Cotran – Atlas of Pathology
- 3- Robin pathology
- 4- Diagnostic techniques for cancer
- 5- Manual of Cytology

<p>6-Carson, Freida L; Christa Hladik (2009). Histotechnology: A Self-Instructional Text (3rd ed. Hong Kong.</p>	
<p>Recommended books and references (scientific journals, reports...)</p> <p>Internet supply</p> <ul style="list-style-type: none"> - Webpathology - Virtual microscopy laboratory - Pathology outlines.com - Diagnostic histopathology: Homepage 	
<p>Electronic References, Websites</p> <p>Internet supply</p> <ul style="list-style-type: none"> - Webpathology - Virtual microscopy laboratory - Pathology outlines.com - Diagnostic histopathology: Homepage 	

Course Description Form

317. Course Name:					
Basic of Magnetic Resonance Imaging					
318. Course Code:					
RAD 306					
319. Semester / Year:					
1 st course 2024 – 2025					
320. Description Preparation Date:					
10 / 7 / 2024					
321. Available Attendance Forms: official full attendance					
2 Hour presence + 3 Hour Lab. = 5 Hour / week					
322. Number of Credit Hours (Total) / Number of Units (Total)					
5 Hours / 3 units					
323. Course administrator's name (mention all, if more than one name)					
Lecturer Dr. Naseer Mahdi Hadi					
324. Course Objectives					
Course Objectives:					
By the end of this course, the student will be able to understand and gain valuable information about the basics of magnetic resonance imaging.					
Specific Objectives:					
To familiarize the student with the basics of magnetic resonance imaging.					
325. Teaching and Learning Strategies					
1- Theoretical/through scientific lectures					
2- Practical/through practical lectures in the hospital					
326. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understands the subject matter	Basics: An Overview of Magnetic Resonance Imaging, Electromagnetism, and Magnetism	Lectures Data show	Quiz

2	2	Understands the subject matter	Radiofrequency pulse sequence, tissue parameters, and image contrast	Lectures Data show	Quiz
3	2	Understands the subject matter	Imaging system, MRI machines.	Lectures Data show	Quiz
4	2	Understands the subject matter	Primary and secondary MRI magnets.	Lectures Data show	Quiz
5	2	Understands the subject matter	Image Composition and Digital Photography	Lectures Data show	Quiz
6	2	Understands the subject matter	MRI images	Lectures Data show	Quiz
7	2	Understands the subject matter	Pulse Sequences: Echo and Chemical Imaging Magnetization Transition and Transfer	Lectures Data show	Quiz
8	2	Understands the subject matter	Pulse Sequences: Hybrid Rapid Imaging and Echo-Planar Imaging Techniques.	Lectures Data show	Quiz
9	2	Understands the subject matter	Applications: Nuclear magnetic resonance Partially parallel magnetic and spectroscopy Magnetic resonance imaging.	Lectures Data show	Quiz
10	2	Understands the subject matter	Applications: Magnetic Resonance Angiography Perfusion Imaging	Lectures Data show	Quiz
11	2	Understands the subject matter	Applications: Diffusion and cardiac imaging MRI.	Lectures Data show	Quiz
12	2	Understands the subject matter	Safety: Contrast Agents and MRI Imaging	Lectures Data show	Quiz
13	2	Understands the subject matter	Safety: MRI	Lectures Data show	Quiz
14	2	Understands the subject matter	Safety: Biological Effects of MRI	Lectures Data show	Quiz
15	2	Understands the subject matter	Summary and Final Exam	Lectures Data show	Quiz

Course description (practical)		
weeks	Laboratory sessions & <i>Clinical requirements</i>	hours

1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
12		
13		
14		
15		

33. Course evaluation

The grade is distributed out of 100 based on the student's assigned tasks, such as daily preparation, daily, oral, and monthly exams, written reports, and the final theoretical and practical exam.

50 points = 35 theoretical + 15 practical

50 points = 35 theoretical + 15 practical

34. Learning and Teaching Resources

Required textbooks (curricular books, if any)	-----
Main references (sources)	MAGNETIC RESONANCE IMAGING, Physical and Biological Principles, 4th edition, 2015
Recommended books and references (scientific journals, reports...)	1- Stewart C. Bushong ScD FAAPM FACR - Radiologic Science for Technologists_ Physics, Biology, and Protection-Mosby (2016) 2- Tim Salditt, Timo Aspelmeier, Sebastian Aeffner. Biomedical Imaging_ Principles of Radiography, Tomography and Medical Physics-De Gruyter (2017). 3- Chris Guy, Dominic Ffytche - An introduction to the principles of medical imaging-Imperial College Press_ Distributed by World Scientific Pub (2005)
Electronic References, Websites	Lectures and reports from internet and YouTube

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	Gilgamesh Ahliya University
2. University Department/Centre	The Medical Technical college/
3. Course title/code	401 RAD
4. Programme(s) to which it contributes	Technical Bachelor in x-ray
5. Modes of Attendance offered	Theoretical and practical
6. Semester/Year	Annually
7. Number of hours tuition (total)	240 hours
8. Date of production/revision of this specification	20/7/2025

9. Aims of the Course	That the student should be a degree in the end of the year to know the following.
All radiological imaging, different contrast imaging by CT scan	

10. Learning Outcomes, Teaching ,Learning and Assessment Methode
<p>B- Knowledge and Understanding</p> <p>A1. Knowledge & understanding CT scan</p> <p>A2. knowledge & understanding of types of CT scan .</p> <p>A3. A working knowledge of CT scan in different cases</p> <p>A4.</p> <p>A5.</p>
<p>B. Subject-specific skills</p> <p>B1. Knowledge of all CT by imaging pictures.</p> <p>B2. Radiographic examinations of all body by CT scan.</p>
Teaching and Learning Methods
<p>6. Lectures.</p> <p>7. Radiographic films.</p> <p>8. laboratory.</p> <p>9. Systematic training and summering.</p> <p>10. View screen.</p>
Assessment methods
<p>6. Written test.</p> <p>7. Quarterly exams.</p> <p>8. Final exam.</p>

- 9. Daily exam.
- 10. Commitment and permanence.

C. Thinking Skills

- c1- learn how to deal with people in using CT scan
- c2- to identify the presence of respect in the exam hall
- c3- not encroach upon any person

Teaching and Learning Methods

- 4. Lectures.
- 5. Educational clinical radiology.
- 6. Systematic training and summers in hospitals.

Assessment methods

- 4. Written test and daily rating.
- 5. Quarterly exam.
- 6. Final exam.

D. General and Transferable Skills (other skills relevant to employability and personal development)

- D1- access to the most important films to illustrate the most important modern scientific experiments
- D2- access to the most important films radiographic imaging by YouTube
- D3- see the most important types of radiation (view scientific films)
- D4- access to books, magazines, reports and modern research

11. Course Structure					
Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
1,2	6		General Principles of Computerized Tomography (CT) : conventional (non-helical) CT , Spiral (Helical) CT.	Theoretical + Practical	1-Quarterly exams. 2-Final exam. 3-Daily exam
3	3		Types of CT scanners: first, second, third, fourth generation scanners.	Theoretical + Practical	
4	3		Basic terms used in CT scanning	Theoretical + Practical	
5	3		Artifacts in multislice scanning	Theoretical + Practical	
6,7,8	9		Principles of contrast medium delivery and scan timing in MDCT.	Theoretical + Practical	
9	3		Cranial CT scanning : routine CT of the brain	Theoretical + Practical	
10	3		Imaging of stroke	Theoretical + Practical	
11,12	6		CT of paranasal sinuses and facial skeleton	Theoretical + Practical	
13,14	6		CT of the neck	Theoretical + Practical	
15,16	6		Thoracic CT	Theoretical + Practical	

17	3		High resolution CT of the lungs	Theoretical + Practical	
18	3		Cardiac CT	Theoretical + Practical	
19	3		CT pulmonary angiography	Theoretical + Practical	
20,21	6		CT : of the gastro-intestinal tract	Theoretical + Practical	
22	3		CT colonography	Theoretical + Practical	
23	3		Virtual CT colonoscopy	Theoretical + Practical	
24,25	6		CT scanning of the liver:non-enhanced CT, single phase contrast enhanced CT,dual phase & triple phase enhanced CT.	Theoretical + Practical	
26	3		CT of the pancreas: CT in pancreatic tumors, CT in pancreatitis.	Theoretical + Practical	
27	3		CT scan of the urinary tract: non-enhanced CT scanning in urinary tract obstruction. CT urography. CT scanning in bladder injury	Theoretical + Practical	
28,29	6		Musculoskeletal CT	Theoretical + Practical	
30	3		CT of trauma patients.	Theoretical + Practical	

12. Infrastructure

Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	
Special requirements (include for example workshops, periodicals, IT software, websites)	
Community-based facilities (include for example, guest Lectures , internship , field studies)	Lectures , internship , field studies

13. Admissions	
Pre-requisites	Students get special books on radiographic imaging using CT scan
Minimum number of students	
Maximum number of students	

وصف البرنامج الأكاديمي

يوفر وصف البرنامج الأكاديمي هذا ايجازاً مقتضياً لأهم خصائص البرنامج ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنناً عما إذا كان قد حقق الاستفادة القصوى من الفرص المتاحة .
ويصاحبه وصف لكل مقرر ضمن البرنامج

جامعة كلكامش الأهلية / كلية	1. المؤسسة التعليمية
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قسم تقنيات الأشعة والسونر	2. القسم العلمي / المركز
اخلاقيات المهنة	3. اسم البرنامج الأكاديمي أو المهني
بكالوريوس	4. اسم الشهادة النهائية
سنوي	5. النظام الدراسي :
لا يوجد	6. برنامج الاعتماد المعتمد
وسائل اعلام ومطبوعات تثقيفية	7. المؤثرات الخارجية الأخرى
15-7-2025	8. تاريخ إعداد الوصف
9. أهداف البرنامج الأكاديمي : الاطلاع على اهم مقومات اخلاق المهنة وكيفية التمييز ما بين التصرفات والسلوكيات الايجابية والسلبية التي تمس المهنة والمجتمع . ومدى ارتباط هذه السلوكيات بالدين والاعراف الاجتماعية .	
10. الوصف الوظيفي للخريج: الحصانة المهنية من اجل تقديم ما هو افضل للمجتمع	

11. مخرجات البرنامج المطلوبة وطرائق التعليم والتعلم والتقييم : تقديم وعرض وفهم اهم مبادئ اخلاقيات المهنة .	
أ- الأهداف المعرفية : تتمثل هذه الاهداف بتشخيص الجوانب الاساسية في التعاملات المهنية وبالاعتماد على الاخلاقيات والسلوكيات الايجابية ومن اجل المصلحة العامة .	-
ب - الأهداف مهارتية الخاصة بالبرنامج : التعلم والاستفادة من المحاضرات والامثلة والمطبوعات ذات العلاقة .	-

طرائق التعليم والتعلم
تعليم الطالب الأساسية المتعلقة باخلاقيات المهنة إعداد المناهج التدريسية الحديثة .- ١ استخدام المفاهيم العلمية.- ٢ تدريب الطلبة باستخدام أساليب تحاكي الواقع.- ٣
طرائق التقييم
الاختبارات اليومية.- ١ الاختبارات الفصلية - ٢ التقارير - ٣ الحضور اليومي والمشاركة داخل الصف.- ٤

د-المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).
1 -تمكين الطالب من اجتياز المقابلات والنجاح في سوق العمل
2-تمكين الطالب من التطوير الذاتي بعد التخرج

12.بنية البرنامج				
عدد الساعات المعتمدة	اسم المقرر أو المساق		رمز المقرر أو المساق	المرحلة الدراسية
	نظري	عملي		
	2	لا يوجد	اخلاقيات مهنة	الرابعة

1. التخطيط للتطور الشخصي : تفعيل المشاركة والمناقشة واعداد دراسات من الواقع وتقديم الحلول المناسبة .

2. معيار القبول (وضع الأنظمة المتعلقة بالإلتحاق بالكلية أو المعهد)

مركزي، حسب متطلبات وزارة التعليم العالي والبحث العلمي

3. أهم مصادر المعلومات عن البرنامج : مصادر معتمدة من هيئة النزاهة الاتحادية .

١ -المنهاج الدراسي المتكامل

٢ -المكتبة العلمية والمكتبة الإلكترونية للجامعة

٣ -الإنترنت

٤ -البحوث العلمية

٥ - توأمة مع الجامعة الأم

10.بنية المقرر

Evaluation	Education methods	Subjects	Required education outputs	Hours	Week
Participation	Lecture		Knowledge and Applications	2	1
=	=		= =	2	2

=	=		= =	2	3
=	=		= =	2	4
=	=		= =	2	5
=	=		= =	2	6
=	=		= =	2	7
=	=		= =	2	8
=	=		= =	2	9
=	=		= =	2	10

Course Description Form

327. Course Name:
Magnetic Resonance Imaging of musculoskeletal system, abdomen and pelvis
328. Course Code:

XUT48244					
329. Semester / Year:					
2 nd semester / 2025					
330. Description Preparation Date:					
15-7-2025					
331. Available Attendance Forms: official full attendance					
personally					
332. Number of Credit Hours (Total) / Number of Units (Total)					
90 hours / 120 units					
333. Course administrator's name (mention all, if more than one name)					
Teaching Assistant / Hiba othman mohammed					
334. Course Objectives					
<p>Course Objectives</p> <p>Provide a concise of the Magnetic Resonance Imaging of musculoskeletal system abdomen and pelvis, to assess different cases & to diagnose different images different cases ,patient preparation, which made the students have t knowledge of all aspects of the specialty</p>					
335. Teaching and Learning Strategies					
Theoretical & practical					
336. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3	Knowledge of the method & preparation of MRI of thoracic spines	MRI of thoracic spines	Lectures & imaging films & videos	Daily exam- final exam
2	3	Knowledge of the method & preparation	MRI of lumbar spine	Lectures & imaging films & videos	Daily exam- final exam
3	3	Knowledge of the method & preparation of MRI of the neck	MRI of the neck	Lectures & imaging films & videos	Daily exam- final exam
4	3	Knowledge of the method & preparation of the MRI of the chest	MRI of chest	Lectures & imaging films & videos	Daily exam- final exam
5	3	Knowledge of the method & preparation of MRI of abdomen	MRI of abdomen	Lectures & imaging films & videos	Daily exam- final exam
6	3	Knowledge of the method & preparation of MRI of biliary tree & pancreas	MRI of biliary tree and pancreas	Lectures & imaging films & videos	Daily exam- final exam
7	3	Knowledge of the method & preparation of MRI of male pelvis	MRI of male pelvis	Lectures & imaging films & videos	Daily exam- final exam
8	3	Knowledge of the method & preparation of MRI of female pelvis	MRI of female pelvis	Lectures & imaging films & videos	Daily exam- final exam
9	3	Knowledge of the method & preparation of MRI of shoulder joint	MRI of shoulder joint	Lectures & imaging films & videos	Daily exam- final exam
10	3	Knowledge of the method & preparation of MRI of the hip joint	MRI of the hip joint	Lectures & imaging films & videos	Daily exam- final exam
11	3	Knowledge of the method & preparation of MRI of Knee joint	MRI of Knee joint	Lectures & imaging films & videos	Daily exam- final exam
12	3	Knowledge of the method & preparation of MRI IN Obstetrics	MRI IN Obstetrics	Lectures & imaging films & videos	Daily exam- final exam
13	3	Knowledge of the method & preparation of MRA AND MRV	MRA AND MRV	Lectures & imaging films & videos	Daily exam- final exam
14	3	Knowledge of the method & preparation of MRI of the trauma and suspected fractures	MRI of the trauma and suspected fractures	Lectures & imaging films & videos	Daily exam- final exam

15	3	Knowledge of the method & preparation of MRI of soft tissue tumors	MRI of soft tissue tumors	Lectures & imaging films & videos	Daily exam- final exam
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Course description (practical)		
weeks	Laboratory sessions & <i>Clinical requirements</i>	hours
1	MRI of thoracic spines	3
2	MRI of lumbar spine	3
3	MRI of the neck	3
4	MRI of chest	3
5	MRI of abdomen	3
6	MRI of biliary tree and pancreas	3
7	MRI of male pelvis	3
8	MRI of female pelvis	3
9	MRI of shoulder joint	3
10	MRI of the hip joint MRI of Knee joint	3
11	MRI of Knee joint	3
12	MRI IN Obstetrics	3
13	MRA AND MRV	3
14	MRI of the trauma and suspected fractures	3
15	MRI of soft tissue tumors	3

35. Course evaluation

weekly examination
reports
Homeworks

36. Learning and Teaching Resources

Required textbooks (curricular books, if any)

Main references (sources)

Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

337. Course Name: nuclear technology medicine
338. Course Code:
339. Semester / Year: 2023-2024
340. Description Preparation Date: 1-12024
341. Available Attendance Forms:
342. Number of Credit Hours (Total) / Number of Units (Total) 3
343. Course administrator's name (mention all, if more than one name)
Name: Jassim Mohammed Najim
Email: alcedik@yahoo.com
344. Course Objectives

Course Objectives	Understand the principles of nuclear medicine imaging. Learn about radiopharmaceuticals and their clinical applications. Familiarize with nuclear medicine instrumentation and imaging techniques. Develop skills in patient care, radiation safety, and quality assurance in nuclear medicine. Explore the role of nuclear medicine in diagnosis, treatment, and research
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345. Teaching and Learning Strategies

Strategy	<p>The teaching and learning strategies for nuclear medicine technology encompass a variety of methods to effectively deliver information and facilitate understanding among students. Here are some key strategies:</p> <ol style="list-style-type: none"> 1. Lectures and Presentations: Traditional classroom lectures and presentations are used to introduce theoretical concepts, principles, and foundational knowledge in nuclear medicine technology. These sessions can include multimedia elements to enhance engagement and understanding. 2. Hands-On Demonstrations: Practical demonstrations using nuclear medicine equipment, simulators, or virtual labs allow students to observe and practice imaging techniques, radiation safety protocols, and quality control procedures. This hands-on experience helps reinforce theoretical learning and develops practical skills. 3. Laboratory Sessions: Laboratory sessions provide students with opportunities to apply theoretical knowledge in a controlled environment. These sessions may involve performing imaging procedures, handling radiopharmaceuticals, and using instrumentation under supervision. 4. Case Studies: Analyzing real-world cases and scenarios helps students apply their knowledge to practical situations. Case studies in nuclear medicine technology focus on diagnosis, treatment planning, image interpretation, and quality assurance challenges. 5. Group Discussions: Facilitating group discussions encourages peer interaction, collaborative learning, and sharing of experiences and insights. Discussions can cover current trends, research findings, ethical considerations, and clinical applications in nuclear medicine. 6. Simulation Exercises: Using computer-based simulations, virtual patients, or scenario-based exercises allows students to practice imaging procedures, patient management, and decision-making in a simulated clinical environment. This enhances critical thinking and problem-solving skills. 7. Interactive Multimedia Resources: Utilizing interactive multimedia resources such as videos, animations, interactive modules, and online tutorials enhances learning by providing visual aids and demonstrations, and self-paced learning opportunities. 8. Guest Lectures and Workshops: Inviting guest speakers, industry experts, and experienced practitioners to conduct specialized workshops, seminars, or lectures exposes students to diverse perspectives, emerging technologies, and real-world applications in nuclear medicine. 9. Research Projects: Assigning research projects or thesis work allows students to delve deeper into specific topics, conduct literature reviews, analyze data, and present findings. Research projects foster independent learning, critical analysis, and scientific inquiry skills. 10. Assessment and Feedback: Incorporating formative and summative assessments, quizzes, assignments, practical exams, and peer evaluations helps evaluate student comprehension, skill mastery, and performance. Feedback mechanisms provide constructive feedback for continuous improvement.
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By integrating these teaching and learning strategies, educators can create a dynamic engaging learning environment for students pursuing studies in nuclear medicine technology.

346. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Introduction to Nuclear Medicine	Principles of Nuclear Medicine Imaging	Lectures, discussion	Quizzes, assignments
2	4	Radiopharmaceuticals	Types, Production, and Quality Control	Lectures, case studies	Exams, research papers
3	4	Nuclear Medicine Imaging Techniques	Planar Imaging, SPECT	Hands-on demonstrations, simulations	Practical exams, case studies
4	4	Nuclear Medicine Instrumentation	Gamma Cameras, PET Scanners	Laboratory sessions, guest lectures	Lab reports, presentations
5	4	Imaging Procedures	Patient Care, Image Acquisition	Clinical practice, simulations	Skills assessments, practical exams
6	4	Radiation Safety in Nuclear Medicine	Protection Principles, Guidelines	Lectures, group discussions	Assessments, compliance checks
7	4	Quality Control in Nuclear Medicine	QA Programs, Instrument Calibration	Practical demonstrations, discussions	QA/QC assessments, audits
8	4	Clinical Applications of Nuclear Medicine	Diagnostic Imaging, Therapeutic Procedures	Case studies, practical training	Clinical simulations, exams
9	4	PET-CT and SPECT-CT Imaging	Hybrid Imaging Techniques	Workshops, hands-on practice	Projects, presentations
10	4	Pediatric Nuclear Medicine	Imaging Protocols for Children	Lectures, case discussions	Reports, quizzes
11	4	Nuclear Medicine in Oncology	Cancer Diagnosis, Therapy Techniques	Guest lectures, case studies	Presentations, exams
12	4	Nuclear Cardiology	Myocardial Imaging, Cardiac Function	Practical sessions, simulations	Skills assessments, practical exams

13	4	Bone Scintigraphy and Musculoskeletal Imaging	Bone Scan Interpretation, Soft Tissue Imaging	Demonstrations, discussions	Image analysis, case reports
14	4	Brain Imaging in Nuclear Medicine	Neurological Applications, PET in Psychiatry	Lectures, case studies	Research projects, presentations
15	4	Research and Emerging Technologies	Molecular Imaging, Future Trends	Research projects, online resources	Research papers, final presentations

347. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc

348. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	<ol style="list-style-type: none"> 1. "Nuclear Medicine Technology: Procedures & Quick Reference" by Pete Shackett 2. "Essentials of Nuclear Medicine Imaging" by F. A. Mettler Jr. and Milton J. Guiberteau 3. Journal articles and online resources from reputable nuclear medicine associations
Electronic References, Websites	