Department of Radiology Technologies

(The fourth stage)

Computed Tomography scan course

This course studies how to teach students about computed tomography examinations of all body organs, the appropriate organs for each examination, the cases that require staining, and how to use it**.**

1. Educational institution	Al-Ayen Iraqi University, College of Health and Medical Technologies
2. Scientific department/center	Department of Radiology Technologies
3. Course name/code	Computed Tomography scan
4. Available forms of attendance	%100
5. Annual/ courses	Annual
6. Number of study hours (total)	2 theoretical hours + 4 practical hours = 6 hours x 30 weeks = 180 hours
7. Date this description was prepared	2024
8. Course objectives Preparation of a radiology technician who works in the CT scanner unit, and has all the knowledge and skills necessary to perform all examinations on the CT scanner.	

10. Course outcomes and teaching, learning and evaluation methods

A- Cognitive objectives

1. Building anatomical and pathological knowledge as an essential part of dealing with the case report sheet.
2. Participate with the radiologist in conducting advanced examinations such as angiography, cardiac, and entrography examinations.
3. Teaching the student how to deal with the device in terms of sustainability and reducing examination errors in cooperation with the Medical Engineering Division in the institution in which he works.
4. Teach the student the concept of (image quality) and distinguishing it from those that give diagnostic errors.

5. Teaching the student the basics of radiation risks and measuring the effective dose before the examination, in cooperation with medical physicists.

B - The skills objectives of the course.

1- Teaching the student how to prepare an appropriate protocol according to the type of examination.

2- Teaching the student post processing techniques to print the final image for examination.

3- Dealing with patients coming from the emergency department in terms of speed and quality.

4- Participate with the rest of the radiology units in evaluating examinations that require more than one examination.

5- Reaching the level of training and education in the institution in which he works for new graduates and graduates of radiography institutes.

6- Dealing with critical cases by performing staining tests, basics of pulmonary and cardiac resuscitation, and reducing the risk of allergic reactions.

Teaching and learning methods

- Lectures
- Video clips

Evaluation methods

1. Written exams every week.
2. Daily oral evaluation.
3. Semester exams.

D - General and qualifying transferable skills (other skills related to employability and personal development).

1- Teaching the student how to deal with patients and their different personality types.

2- Teaching students psychological care skills for people with disabilities and oncology patients.

3- Teaching the student the foundations of health management in the CT-scan unit in terms of archiving and making statistics.

4- Teaching the student the basics of teaching methods

11. Course structure					
Evaluation method	Teaching method	Name of the unit/topic	Education outcomes	hours	the week
Applied and test	Interactive	*Basic of CT i*	Understands the material	hours theoretical + 2 hours practical 4	**.1**
Applied and test	Interactive	*Basic of CT ii*	Understands the material	hours theoretical + 2 hours practical 4	**.2**
Applied and test	Interactive	*Types of CT*	Understands the material	hours theoretical + 2 hours practical 4	**.3**
Applied and test	Interactive	*Basic terms*	Understands the material	hours theoretical + 2 hours practical 4	**.4**
Applied and test	Interactive	*CT artifacts*	Understands the material	hours theoretical + 2 hours practical 4	**.5**
Applied and test	Interactive	*Contrast media i*	Understands the material	hours theoretical + 2 hours practical 4	**.6**
Applied and test	Interactive	*Contrast media ii*	Understands the material	hours theoretical + 2 hours practical 4	**.7**
Applied and test	Interactive	*Contrast media iii*	Understands the material	hours theoretical + 2 hours practical 4	**.8**
Applied and test	Interactive	*Brain CT*	Understands the material	hours theoretical + 2 hours practical 4	**.9**
Applied and test	Interactive	*Stroke CT*	Understands the material	hours theoretical + 2 hours practical 4	**.10**
Applied and test	Interactive	*Paranasal CT i*	Understands the material	hours theoretical + 2 hours practical 4	**.11**
Applied and test	Interactive	*Paranasal CT ii*	Understands the material	theoretical + hours 2 hours practical 4	**.12**
Applied and test	Interactive	*Thorasic CT i*	Understands the material	hours theoretical + 2 hours practical 4	**.13**
Applied and test	Interactive	*Thoracic CT ii*	Understands the	hours theoretical + 2 hours practical 4	**.14**

			material		
Applied and test	Interactive	*HR Lung CT*	Understands the material	hours theoretical + 2 hours practical 4	**.15**
Applied and test	Interactive	*Cardiac CT*	Understands the material	hours theoretical + 2 hours practical 4	**.16**
Applied and test	Interactive	*Neck CT i*	Understands the material	hours theoretical + 2 hours practical 4	**.17**
Applied and test	Interactive	*Neck CT ii*	Understands the material	hours theoretical + 2 hours practical 4	**.18**
Applied and test	Interactive	*Pulmonary Art. CT*	Understands the material	theoretical + hours 2 hours practical 4	**.19**
Applied and test	Interactive	*CT GIT i*	Understands the material	hours theoretical + 2 hours practical 4	**.20**
Applied and test	Interactive	*CT GIT ii*	Understands the material	hours theoretical + 2 hours practical 4	**.21**
Applied and test	Interactive	*CT colonography*	Understands the material	hours theoretical + 2 hours practical 4	**.22**
Applied and test	Interactive	*Virtual CT*	Understands the material	hours theoretical + 2 hours practical 4	**.23**
Applied and test	Interactive	*CT liver (phasing CM) i*	Understands the material	hours theoretical + 2 hours practical 4	**.24**
Applied and test	Interactive	*CT liver (phasing CM) ii*	Understands the material	hours theoretical + 2 hours practical 4	**.25**
Applied and test	Interactive	*Pancreas CT*	Understands the material	hours theoretical + 2 hours practical 4	**.26**
Applied and test	Interactive	*Urinary CT*	Understands the material	hours theoretical + 2 hours practical 4	**.27**
Applied and test	Interactive	*MSK CT i*	Understands the material	+ hours theoretical 2 hours practical 4	**.28**
Applied and test	Interactive	*MSK CT ii*	Understand	hours theoretical + 2 hours practical 4	**.29**

			s the material		
Applied and test	Interactive	*CT trauma*	Understands the material	hours theoretical + 2 hours practical 4	**.30**

12. Infrastructure	
1- Required prescribed books	Training bag
2- Main references (sources)	Computed Tomography for Technologists: A Comprehensive Tex
A-Recommended books and references (scientific journals, reports,...)	Studies published on the PUBmed website
B - Electronic references, Internet sites...	Radiopedia.org

13. Course development plan
The curriculum development plan is based on the following: 1. Giving the prescribed scientific material and observing and analyzing the students' results 2. Study feedback from students' comments about vocabulary 3. Study the practical laboratory notes for the course 4. Comparing current vocabulary with the vocabulary of corresponding colleges in the field

Principles of medicine and surgery course

This course studies all the important information in evaluating pathological conditions and following modern methods of diagnosing diseases

1. Educational institution	Al-Ayen Iraqi University, College of Health and Medical Technologies
2. Scientific department/center	Department of Radiology Technologies
3. Course name/code	Principles of medicine and surgery
4. Available forms of attendance	%100
5. Annual/ courses	Annual
6. Number of study hours (total)	2 theoretical hours + 3 practical hours = 5 hours x 30 weeks = 150 hours
7. Date this description was prepared	2024
8. Course objectives 1. Providing students with practical and theoretical information on how to care for patients and collecting all important information in evaluating pathological cases and following modern methods in diagnosing diseases. 2. Teaching students everything related to diseases and their symptoms 3. Introducing students to various pathogens, their transmission methods, and their epidemiology 4. Teaching and training students on methods of diagnosing diseases	

10. Course outcomes and teaching, learning and evaluation methods
A- Cognitive objectives 1. Enabling students to know the most important internal diseases in humans, their methods of transmission, symptoms, and causes, and to differentiate between them. 2. Enabling students to know the most important methods of diagnosing diseases, especially those that rely on radiographs, ultrasound, MRI, etc. 3. Enabling students to know the most important surgical interventions that help diagnose some disease

B - The skills objectives of the course.

1. Training students on how to collect information about the history of medical cases
2. Training students on how to care for patients and consider them physically and psychologically, especially those who need surgical intervention.
3. Training students to be able to read and take radiographs and operate various sonar and resonance devices

Teaching and learning methods

- Lectures
- Video clips

Evaluation methods

1. Written exams every week.
2. Daily oral evaluation.
3. Semester exams.

C- Emotional and evalution objectives

1. Enabling students to adapt the hospital environment and medical conditions
2. Enabling students to understand the suffering and pain of patients and how to provide assistance to them
3. Developing students' ability to tolerate and deal with various medical conditions

D - General and qualifying transferable skills (other skills related to employability and personal development).

1. Enabling students to continue self-development after graduation through training courses
2. Enabling students to pass job interviews

11.Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Applied and test	Interactive	**Headache: types & imaging of headache**	Understands the material	2 theoretical + 3 practical	**1,2**
Applied and test	Interactive	**Head injury: the role of imaging in head injury**	Understands the material	2 theoretical + 3 practical	**3**
Applied and test	Interactive	**Cerebrovascular accident (CVA):imaging in CVA**	Understands the material	2 theoretical + 3 practical	**4,5**
Applied and test	Interactive	**Paranasal sinuses: imaging in paranasal sinuses diseases**	Understands the material	2 theoretical + 3 practical	**6**
Applied and test	Interactive	**The orbit: imaging in orbital diseases**	Understands the material	2 theoretical + 3 practical	**7**
Applied and test	Interactive	**The spine: imaging of spinal lesions**	Understands the material	2 theoretical + 3 practical	**8**
Applied and test	Interactive	**The neck: role of imaging in neck masses**	Understands the material	2 theoretical + 3 practical	**9**
Applied and test	Interactive	**Bone disease: infection, tumor**	Understands the material	2 theoretical + 3 practical	**10,11**
Applied and test	Interactive	**Bone fracture: types & imaging**	Understands the material	2 theoretical + 3 practical	**12**
Applied and test	Interactive	**Respiratory tract diseases: infections, chest trauma, lung masses**	Understands the material	2 theoretical + 3 practical	**13**
Applied and test	Interactive	**Pulmonary embolism, pneumothorax, pleural effusion.**	Understands the material	2 theoretical + 3 practical	**14**
Applied and test	Interactive	**Urinary tract obstruction: causes, clinical features & imaging.**	Understands the material	2 theoretical + 3 practical	**15**
Applied and test	Interactive	**Urinary tact infection: imaging in UTI**	Understands the material	2 theoretical + 3 practical	**16**
Applied and test	Interactive	**Renal & physical tumors: types, features, imaging.**	Understands the material	2 theoretical + 3 practical	**17**
Applied and test	Interactive	**Cystic diseases of kidney, congenital.**	Understands the material	2 theoretical + 3 practical	**18**
Applied and test	Interactive	**GIT: diseases of esophagus.**	Understands the material	2 theoretical + 3 practical	**19**
Applied and test	Interactive	**Diseases of the stomach: gastric mass, ulcer**	Understands the material	2 theoretical + 3 practical	**20**
Applied and test	Interactive	**Diseases of duodenum: Duodenal ulcer (DU).**	Understands the material	2 theoretical + 3 practical	**21**
Applied and test	Interactive	**Diseases of jejunum & ileum.**	Understands the material	2 theoretical + 3 practical	**22**
Applied and test	Interactive	**Diseases of colon**	Understands the material	2 theoretical + 3 practical	**23**
Applied and test	Interactive	**Liver: hepatitis, jaundice, cholecystitis , portal hypertension.**	Understands the material	2 theoretical + 3 practical	**24**
Applied and test	Interactive	**Hepatic masses: role of imaging**	Understands the material	2 theoretical + 3 practical	**25**
Applied and test	Interactive	**Female reproductive system: infertility, causes & role of imaging.**	Understands the material	2 theoretical + 3 practical	**26**

Applied and test	Interactive	**Tumors of uterus&ovaries**	Understands the material	2 theoretical + 3 practical	**27**
Applied and test	Interactive	**Breast masses: benign & malignant**	Understands the material	2 theoretical + 3 practical	**28**
Applied and test	Interactive	**Diseases of vascular system**	Understands the material	2 theoretical + 3 practical	**29**
Applied and test	Interactive	**Final examination**	Understands the material	2 theoretical + 3 practical	**30**

12. Infrastructure	
1- Required prescribed books	1-Textbook of medical –surgical nursing , ed. 1996 by ths . 8'Brunner and SuddarthSuzanne C. Smeltzer : Brenda G. Bane . Lippincott-raven publishers
2- Main references (sources)	1-Medical –surgical nursing, critical thinking for collaborate care. Donna D. Ignatavicius; . Ed. 2006 Elsevier thM.Linda Workman. 5Saunders Inc. 2-Assessement and management of clinical .ed. thproblems , Lewis, Heitkeper, Dirksen. 62004 Mosby, Inc.
A-Recommended books and references (scientific journals, reports,...)	Anatomy for diagnostic imaging , second edition , Stephanie ryan
B - Electronic references, Internet sites...	The official website of Al-Ayen Iraqi University

13. Course development plan
The curriculum development plan is based on the following: 1. Giving the prescribed scientific material and observing and analyzing the students' results 2. Study feedback from students' comments about vocabulary 3. Study the practical laboratory notes for the course 4. Comparing current vocabulary with the vocabulary of corresponding colleges in the field

Magnetic resonance imaging course

The student teaches how to conduct MRI examinations for all body procedures, the appropriate clips and protocols for each examination, the cases that require the use of staining material, and how to use it.

1. Educational institution	Al-Ayen Iraqi University, College of Health and Medical Technologies
2. Scientific department/center	Department of Radiology Technologies
3. Course name/code	Magnetic resonance imaging
4. Available forms of attendance	%100
5. Annual/ courses	Annual
6. Number of study hours (total)	2 theoretical hours + 4 practical hours = 6 hours x 30 weeks = 180 hours
7. Date this description was prepared	2024
8. Course objectives This course aims to prepare university students to fully understand the radiological procedures for MRI examinations, making them able to teach the student how to use contrast media in MRI and conduct examinations of various body systems. And refining the capabilities and skills of radiology technicians to work in the field of arterial and venous examinations, cardiac imaging examinations, and functional resonance imaging examinations to differentiate between benign and malignant tumors, as well as examinations to measure brain activities to identify some diseases caused by increased or decreased brain activity.	

10. Course outcomes and teaching, learning and evaluation methods

A- Cognitive objectives

1. Teach the student how to use contrast media with MRI examinations
2. Identifying the anatomy after using contrast material in MRI images
3-Knowing the time to give contrast material based on the MRI images
4. The ability to define and use abbreviations for radiological procedures related to MRI.
5. Getting to know the reading of radioactive chips after the contrast procedure.
6- Identify the principle of MRI and its relationship to the nature of the disease and the form of the examination image

B - The skills objectives of the course.

1- Teaching how to deal with the dye and the relationship between the timing of administration and showing the anatomical parts
2- Comparison between the anatomical parts of the body in different radiology devices before and after contrast (resonance imaging)
3- Maintaining the quality of the radiological examination
4- Skills in choosing the protocol according to the type of disease and not choosing the protocol according to the part of the body examined

Teaching and learning methods

- Lectures
- Video clips

Evaluation methods

1. Written exams every week.
2. Daily oral evaluation.
3. Semester exams.

D - General and qualifying transferable skills (other skills related to employability and personal development).

1- The ability to search for information, analyze it statistically, and extract it through the use of the studied programs.
2- The ability to collect information, analyze it, and summarize the main ideas.
3- Writing technical reports about the devices used in the field of specialization.

11. Course structure					
Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
and apply Test	Interactive	MRI terms1	Understands the material	2 theoretical + 4 practical	1.
Test and apply	Interactive	MRI terms1	Understands the material	2 theoretical + 4 practical	2.
Test and apply	Interactive	Concepts of MRI	Understands the material	2 theoretical + 4 practical	3.
Test and apply	Interactive	Concepts of MRI	Understands the material	2 theoretical + 4 practical	4.
Test and apply	Interactive	Principle of mri	Understands the material	2 theoretical + 4 practical	5.
Test and apply	Interactive	Principle of mri	Understands the material	2 theoretical + 4 practical	6.
Test and apply	Interactive	Pulse sequences and Image Contrast 1	Understands the material	2 theoretical + 4 practical	7.
Test and apply	Interactive	Pulse sequences and Image Contrast 2	Understands the material	2 theoretical + 4 practical	8.
Test and apply	Interactive	Artifacts and their compensation	Understands the material	2 theoretical + 4 practical	9.
Test and apply	Interactive	Mri Safety prepration and contrast agent	Understands the material	2 theoretical + 4 practical	10.
Test and apply	Interactive	Mri Safety prepration and contrast agent	Understands the material	2 theoretical + 4 practical	11.
Test and apply	Interactive	MRI of the brain	Understands the material	2 theoretical + 4 practical	12.
Test and apply	Interactive	MRI of the brain 2	Understand	2 theoretical	13.

			s the material	+ 4 practical	
Test and apply	Interactive	Mri orbital	Understands the material	2 theoretical + 4 practical	14.
apply Test and	Interactive	Mri cs	Understands the material	2 theoretical + 4 practical	15.
Test and apply	Interactive	Mri thoracic	Understands the material	2 theoretical + 4 practical	16.
Test and apply	Interactive	Mri of neck	Understands the material	2 theoretical + 4 practical	17.
Test and apply	Interactive	Mri chest	Understands the material	2 theoretical + 4 practical	18.
Test and apply	Interactive	MRI of the abdomen	Understands the material	2 theoretical + 4 practical	19.
Test and apply	Interactive	MRI of the slave 2	Understands the material	2 theoretical + 4 practical	20.
Test and apply	Interactive	Mri of biliary tree and pancreas	Understands the material	2 theoretical + 4 practical	21.
Test and apply	Interactive	MRI of the mal pelvis	Understands the material	2 theoretical + 4 practical	22.
Test and apply	Interactive	MRI of the femal pelvis	Understands the material	2 theoretical + 4 practical	23.
Test and apply	Interactive	Mri of shoulder j.	Understands the material	2 theoretical + 4 practical	24.
Test and apply	Interactive	Mri of hip joint	Understands the material	2 theoretical + 4 practical	25.
Test and apply	Interactive	Mr of knee j.	Understands the material	2 theoretical + 4 practical	26.

Test and apply	Interactive	MRI in obstetrics	Understands the material	2 theoretical + 4 practical	27.
Test and apply	Interactive	MRA &MRV	Understands the material	2 theoretical + 4 practical	28.
Test and apply	Interactive	MRI of suspected fracture	Understands the material	2 theoretical + 4 practical	29.
Test and apply	Interactive	Mri of soft tissue	Understands the material	2 theoretical + 4 practical	30.

12. Infrastructure	
1- Required prescribed books	Training bag
2- Main references (sources)	MRI A to Z : Gary Liney - MRI at a Glance: Catherine Westbrook Principles of Magnetic Resonance Imaging: Physics Concepts, Pulse Sequences, & Biomedical Applications [Wang PhD, Yi]
A-Recommended books and references (scientific journals, reports,...)	Radiopedia
B - Electronic references, Internet sites...	The official website of Al-Ayen Iraqi University

13. Course development plan
The curriculum development plan is based on the following: 1. Giving the prescribed scientific material and observing and analyzing the students' results 2. Study feedback from students' comments about vocabulary 3. Study the practical laboratory notes for the course 4. Comparing current vocabulary with the vocabulary of corresponding colleges in the field

Ultrasound imaging course

This course studies the working principle of the ultrasound device, its terminology, types of ultrasound sensors, and its uses

1. Educational institution	Al-Ayen Iraqi University, College of Health and Medical Technologies
2. Scientific department/center	Department of Radiology Technologies
3. Course name/code	Ultrasound imaging
4. Available forms of attendance	%100
5. Annual/ courses	Annual
6. Number of study hours (total)	2 theoretical hours + 4 practical hours = 6 hours x 30 weeks = 180 hours
7. Date this description was prepared	2024

8. Course objectives

The student will be able to know:

- The working principle of the ultrasound device, its terminology, types of ultrasound sensors, and its uses
- Preparing patients for examination
- Ultrasound indications for each examination
- Voice manifestations of normal and abnormal organs
- Differential diagnosis of diseases and lesions of the abdominal organs

10. Course outcomes and teaching, learning and evaluation methods

A- Cognitive objectives

- Knowledge and understanding
- Building radiology technicians with scientific efficiency
- Good understanding of scientific materials
- Gaining knowledge in ultrasound examinations
- Using the application in the field of work can combine obtaining new ideas efficiently
- Teaching the student how to handle the ultrasound device and the examination method

B - The skills objectives of the course.

• The student practices his specialty

• Develop their English and medical terminology related to their field

• Solve problems facing students in their jobs and know how to deal with them in specific and emergency situations

Teaching and learning methods

- Lectures
- Video clips

Evaluation methods

1. Written exams every week.
2. Daily oral evaluation.
3. Semester exams.

D - General and qualifying transferable skills (other skills related to employability and personal development).

• Gaining practical experience enables the acquisition of skills

• Gaining scientific experience enables the acquisition of skills

• The graduate has the ability to acquire development skills

• The graduate will have the ability to complete his studies in his field of specialization in general and in the field of ultrasound imaging in particular.

11. Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	the week
Test and apply	Interactive	**PrincipleIe of ultrasound and its terms**	Understands the material	2 theoretical + 4 practical	1.
Test and apply	Interactive	**Normal appearance or the liver**	Understands the material	2 theoretical + 4 practical	2.
Test and apply	Interactive	**:Abnormal liver** **:Enlarged liver/hepatomegaly** **‹homogeneous pattern** **:Enlarged liver** **‹non-homogeneous pattern** **Small liver/shrunken liver**	Understands the material	2 theoretical + 4 practical	3.
Test and apply	Interactive	**Cystic lesions in normal or larger liver**	Understands material the	2 theoretical + 4 practical	4.
Test and apply	Interactive	**Differential diagnosis of liver masse** **Trauma of the liver**	Understands the material	2 theoretical + 4 practical	5.
Test and apply	Interactive	**Normal appearance gallbladder and biliary tract**	Understands the material	2 theoretical + 4 practical	6.
Test and apply	Interactive	**abnormal gallbladder and biliary tract:**	Understands the material	2 theoretical + 4 practical	7.

		‹extended gallbladder **‹Acute cholecystitis** **Echoes within the gallbladder**			
Test and apply	Interactive	**thick gallbladder walls,** **small gallbladder,** **Gallbladder in Jaundice**	Understands the material	2 theoretical + 4 practical	8.
Test and apply	Interactive	**Normal and abnormal appearance of pancreas**	Understands the material	2 theoretical + 4 practical	9.
Test and apply	Interactive	**Normal and abnormal appearance of spleen**	Understands the material	2 theoretical + 4 practical	10.
Test and apply	Interactive	**Normal appearance of the kidney** **‹and ureters** **Considerations of the absent ‹kidney** **abnormal kidney: large kidney**	Understands the material	2 theoretical + 4 practical	11.
Test and apply	Interactive	**Renal cysts, Renal masses**	Understands the material	2 theoretical + 4 practical	12.
Test and apply	Interactive	**Small kidney.** **‹Renal calculi** **‹Trauma** **Peripheral fluid**	Understands the material	2 theoretical + 4 practical	13.
Test and apply	Interactive	**Normal and abnormal appearance of the urinary bladder**	Understands the material	2 theoretical + 4 practical	14.
Test and apply	Interactive	**Normal and abnormal appearance of the thyroid gland**	Understands the material	2 theoretical + 4 practical	15.
Test and apply	Interactive	**Gynecology (non-pregnant female pelvis): normal appearance of the uterus**	Understands the material	2 theoretical + 4 practical	16.
Test and apply	Interactive	**Intrauterine contraceptive device, fluid in the posterior cul-de-sac**	Understands the material	2 theoretical + 4 practical	17.
Test and apply	Interactive	**‹The endometrium** **position of the uterus** **ovaries**	Understands the material	2 theoretical + 4 practical	18.
Test and apply	Interactive	**:Ovaries** **normal appearance of the ovary** **ovarian follicles**	Understands the material	2 theoretical + 4 practical	19.
Test and apply	Interactive	**Abnormal uterus:** **‹myomas** **malignant disease**	Understands the material	2 theoretical + 4 practical	20.
Test and apply	Interactive	**Appearance of the uterine endometriosis**	Understands the material	2 theoretical + 4 practical	21.
Test and apply	Interactive	**:Abnormal variation**	Understands	2 theoretical	22.

		‹Ovarian cysts Pelvic hydatid cyst solid ovarian masses	the material	+ 4 practical	
Test and apply	Interactive	**‹Pelvic inflammatory disease ‹pelvic abscess, pelvic varices fallopian tubes**	Understands the material	2 theoretical + 4 practical	23.
Test and apply	Interactive	**Obstetrics: Introduction to obstetrics**	Understands the material	2 theoretical + 4 practical	24.
Test and apply	Interactive	**Early pregnancy ectopic pregnancy**	Understands material the	2 theoretical + 4 practical	25.
Test and apply	Interactive	**The appearance of the embryo yolk bag multiple pregnancy**	Understands the material	2 theoretical + 4 practical	26.
Test and apply	Interactive	**Abnormalities in the first trimester of pregnancy**	Understands the material	2 theoretical + 4 practical	27.
Test and apply	Interactive	**Estimation of fetal size and age (fetal biometry)**	Understands the material	2 theoretical + 4 practical	28.
Test and apply	Interactive	**Normal and abnormal :appearance of the testis ‹Unilateral swelling Small or absent testis**	Understands the material	2 theoretical + 4 practical	29.
Test and apply	Interactive	**Normal and abnormal ‹appearance of epididymis ‹trauma ‹Torsion of the testis hernia and varicocele**	Understands the material	2 theoretical + 4 practical	30.

12. Infrastructure	
1- Required prescribed books	Training bag
2- Main references (sources)	• Manual of diagnostic ultrasound Edited by P.E.S Palmer • Paul L. Allan, Grant M. Baxter, Michael J.Weston. Clinical Ultrasound. Volume one, 3 rd Edition, 2011. • Gibbs JF, Litwin AM, Kahlenberg MS (2004) Contemporary
A-Recommended books and references (scientific journals, reports,...)	1. Examination Review for Ultrasound: Abdomen and Obstetrics & Gynecology by Steven M. 2. Introduction to Sonography and Patient Care by Steven M. Penny M.A 3. Ultrasound Secrets by Vikram S 4. Basics of Musculoskeletal Ultrasound by

	James M. Diagnostic Ultrasound: Musculoskeletal by James F.
B - Electronic references, Internet sites...	• Ultrasoundpaedia

13. Course development plan
• Introducing modern technology and interactive technology into the educational process • Introducing modern technology and interactive technology with the educational and illustrative means used for the student • Trying to twin with international universities that have the same branches as our department, and learning about their experiences and the curricula used for students. • Continue to hold local or international workshops for faculty members to develop their capabilities. • The topic of special or advanced procedures, where the student will learn the anatomical part, the method of examining it, the radiological anatomy that will appear in it, and the diseases that will accompany it. Therefore, we will focus more on A single study platform based on what the student is studying by unifying the curriculum titles and curricula for various subjects. • The interconnection of the study materials for one stage with the rest of the stages, as the student can, for example, when studying anatomy in radiological anatomy, study at the same time the method of ultrasound imaging of this area and the diseases that pertain to this anatomical part.

Biostatistics and computer applications course

This course aims for the student to learn the correct methods for conducting scientific research and the statistical tools used in scientific research

1. Educational institution	Al-Ayen Iraqi University, College of Health and Medical Technologies
2. Scientific department/center	Department of Radiology Technologies

3. Course name/code	Biostatistics and computer applications
4. Available forms of attendance	%100
5. Annual/ courses	Annual
6. Number of study hours (total)	2 theoretical hours + 2 practical hours = 4 hours x 30 weeks = 120 hours
7. Date this description was prepared	2024
8. Course objectives 1. That the student learns the correct methods for conducting scientific research 2. Using correct statistical tools in scientific research	

10. Course outcomes and teaching, learning and evaluation methods
A- Cognitive objectives 1. To know scientific research. 2. To know the medical and health survey 3. To choose the topic of scientific research
B - The skills objectives of the course. 1. To learn to write a scientific research plan, its stages and parts 2. To learn to collect, present and represent data
Teaching and learning methods
• Lectures • clips Video
Evaluation methods
1. Written exams every week. 2. Daily oral evaluation. 3. Semester exams.
D - General and qualifying transferable skills (other skills related to employability and personal development). The student learns the methods of collecting statistical data and what are the best of these methods, and then how to analyze, display and represent this data, how to apply it in reality, and what is the benefit of it.

11. Course structure

Evaluation method	Teaching method	of the unit/topic Name	Required learning outcomes	hours	the week
Test and apply	Interactive	General introduction, definition of scientific research, definition of survey, selection of research topics, scientific research methods	Understands the material	2 theoretical + 2 practical	1.
Test and apply	Interactive	Scientific research plan, its preparation, elements, and parts of the research when writing	Understands the material	2 theoretical practical2+	2.
Test and apply	Interactive	Stages of the statistical method and their importance	Understands material the	2 theoretical practical2+	3.
Test and apply	Interactive	Methods of collecting, classifying and tabulating information and data	Understands the material	2 theoretical practical2+	4.
Test and apply	Interactive	Methods of displaying data, frequency tables	Understands the material	2 theoretical practical2+	5.
Test and apply	Interactive	Graphs, measures of central tendency	Understands the material	2 theoretical practical2+	6.
Test and apply	Interactive	Relative and absolute stabilization .measures. With applied examples	Understands the material	2 theoretical practical2+	7.
Test and apply	Interactive	Introduction to probability	Understands the material	2 theoretical practical2+	8.
Test and apply	Interactive	Formulation of probability, types of probability	Understands the material	2 theoretical practical2+	9.
Test and apply	Interactive	Its application in the medical and applied health field. With examples	Understands the material	2 theoretical practical2+	10.
Test and apply	Interactive	Measures of torsion and effacement: definition of measures of torsion, definition of . measures of effacement	Understands the material	2 theoretical practical2+	11.
Test and apply	Interactive	Calculation methods. With .applied examples	Understands the material	2 theoretical practical2+	12.
Test and apply	Interactive	Time series: its components, methods for calculating the general trend	Understands the material	2 theoretical practical2+	13.
Test and apply	Interactive	Its application in the field of medical and health research. With .applied examples	Understands the material	2 theoretical practical2+	14.
Test and apply	Interactive	Estimation: Point estimate, .Confidence interval estimate	Understands the material	2 theoretical practical2+	15.
Test and apply	Interactive	.Practical examples	Understands the material	2 theoretical practical2+	16.
Test and apply	Interactive	the concept of tests, errors : tests of the first and second types	Understands the material	2 theoretical practical2+	17.

Test and apply	Interactive	Significance level, degrees of freedom	Understands the material	2 theoretical practical2+	18.
Test and apply	Interactive	Tests based on the normal distribution, tests based on the Student's distribution	Understands the material	2 theoretical practical2+	19.
Test and apply	Interactive	(F) Tests based on the distribution, tests based on the distribution square -Chi	Understands the material	2 theoretical practical2+	20.
Test and apply	Interactive	.Practical examples	Understands the material	2 theoretical practical2+	21.
Test and apply	Interactive	Analysis of variance: one .(Anova) criterion, two criteria .With applied examples	Understands the material	2 theoretical practical2+	22.
Test and apply	Interactive	Analysis of variance: one .(Anova) criterion, two criteria .With applied examples	Understands the material	2 theoretical practical2+	23.
Test and apply	Interactive	Analysis of variance: one .(Anova) criterion, two criteria .With applied examples	Understands the material	2 theoretical practical2+	24.
Test and apply	Interactive	Simple correlation coefficient, coefficient. simple regression .With applied examples	Understands the material	2 theoretical practical2+	25.
Test and apply	Interactive	Simple correlation coefficient, simple regression coefficient. .With applied examples	Understands the material	2 theoretical practical2+	26.
Test and apply	Interactive	Vital statistics: rates and ratios of life phenomena (birth rates, death (rates, fertility rates	Understands the material	2 theoretical practical2+	27.
Test and apply	Interactive	Vital statistics: rates and ratios of life phenomena (birth rates, death (rates, fertility rates	Understands the material	2 theoretical practical2+	28.
Test and apply	Interactive	Vital statistics: rates and ratios of life phenomena (birth rates, death (rates, fertility rates	Understands the material	2 theoretical practical2+	29.
Test and apply	Interactive	Vital statistics: rates and ratios of life phenomena (birth rates, death (rates, fertility rates	Understands the material	2 theoretical practical2+	30.

12. Infrastructure	
1- Required prescribed books	Training bag
2- Main references (sources)	1. DANIEL, W. W. "Biostatistics: a foundation for analysis in the health sciences", Eleven Edition, 2018. 2. David M Levine and David F. Stephan, Even you can learn statistics : a guide for

	everyone who has ever been afraid of statistics, Eleven Edition, 2011. James T McClave and Terry Sincich. Statistics, Tenth Edition, 2005.
A-Recommended books and references (scientific journals, reports,...)	Book of Life Statistics, author Abdul Khaleq Abdul Jabbar Al Naqeeb. 1993 AD
B - Electronic references, Internet sites...	The official website of Al-Ayen Iraqi University

13. Course development plan
The curriculum development plan is based on the following: 1. Giving the prescribed scientific material and observing and analyzing the students' results 2. Study feedback from students' comments about vocabulary 3. Study the practical laboratory notes for the course 4. Comparing current vocabulary with the vocabulary of corresponding colleges in the field

Professional ethics course

This course aims to familiarize the student with professional ethics and provide him with professional ethical rules that enhance his commitment to them in his field of work, as well as studying moral values and the importance of ethics for the individual, society, and work.

1. Educational institution	Al-Ayen Iraqi University, College of Health and Medical Technologies
2. Scientific department/center	Department of Radiology Technologies
3. Course name/code	Professional ethics
4. Available forms of attendance	%100
5. Annual/ courses	Annual
6. Number of study hours (total)	1 theoretical hours x 30 weeks = 30 hours
7. Date this description was prepared	2024
8. Course objectives This course aims to determine the behavioral objectives within the framework of the lesson plan at the single lecture level and identify the factors affecting the job outcomes	

10. Course outcomes and teaching, learning and evaluation methods
A- Cognitive objectives 1-Method of establishing professional ethics. 2-Levels of building and consolidating professional ethics. 3-Means and methods of consolidating professional ethics.
B - The skills objectives of the course. 1- Identify habits and skills 2- Knowing the factors and problems
Teaching and learning methods
• Lectures • Video clips
Evaluation methods
1. Written exams every week. 2. Daily oral evaluation.

3. Semester exams.
C- Emotional and evalution objectives 1. Enabling students to adapt the hospital environment and medical conditions 2. Enabling students to understand the suffering and pain of patients and how to provide assistance to them 3. Developing students' ability to tolerate and deal with various medical conditions
D - General and qualifying transferable skills (other skills related to employability and personal development). 1. Enabling students to continue self-development after graduation through training courses 2. Enabling students to pass job interviews

11. Course structure					
Evaluation method	Teaching method	unit/topic Name of the	Required learning outcomes	hours	the week
Test and apply	Interactive	.The concept of morality and its origin .General rules of ethics.	Understands the material	**1**	**2-1**
Test and apply	Interactive	Ethics sources Moral values	Understands the material	**1**	**4-3**
Test and apply	Interactive	.To do and its importance .Work behaviors .Concept of profession .Definition of profession . The difference between the concept of . work, profession and craft. Standards upon which the profession must be .based	Understands the material	**1**	**6-5**
Test and apply	Interactive	؟What are professional ethics Positive outcomes of commitment to .professional ethics Characteristics of work ethics .Characteristics of work ethics Steps for the acceptable level of Values -Four professional ethics. Unit and professional ethics	Understands the material	**1**	**8-7**
Test and apply	Interactive	.To be honest .Honesty .Advice .	Understands the material	**1**	**10-9**
Test and apply	Interactive	.Justice Good dealing and mastery of work	Understands the material	**1**	**-11 12**
Test and apply	Interactive	Unethical administrative behavior Definition of administrative corruption - .Types of administrative corruption Bribery The concept of bribery .Types of bribery	Understands the material	**1**	**-13 14**
Test and apply	Interactive	The difference between a gift and a bribe The reasons and motives behind bribery Cheating .The concept of cheating .The nature of fraud at work- Manifestations of fraud in job	Understands the material	**1**	**16-15**

		.performance			
Test and apply	Interactive	Method of establishing professional .ethics Levels of building and consolidating .professional ethics Means and methods of consolidating .professional ethics	Understands the material	**1**	**-17 18**
Test and apply	Interactive	into Things that must be taken . consideration in formulating the ethical . .code of the profession How to promote ethical behavior at work according to (Kreitner) . And .(Kenicki	Understands the material	**1**	**-19 20**
Test and apply	Interactive	Characteristics and prescriptions of the .medical technician Duties of a medical technician towards .his profession, patient, society	Understands the material	**1**	**22-21**
Test and apply	Interactive	:Patient rights Justice and equality confidentiality of Maintaining the patient information patient privacy Maintain consent Informed Comprehensive care Putting the patient's interests first. . Effective 28-Communicating with 27 have the right communication Patients Rights to to access medical records health records	Understands the material	**1**	**-23 24**
Test and apply	Interactive	It is related to the basic rules of the profession to prevent the spread of epidemics and diseases, as well as the importance of its role in spreading the .disease The medical technician with society and the his responsibility towards environment and public safety through technology Health and ways to prevent .the spread of diseases	Understands the material	**1**	**-25 26**
Test and apply	Interactive	Professional relationship: The relationship of the medical technician in the health with his colleagues .institution Respect, cooperation, avoiding criticism in front of patients, accuracy and honesty in evaluating performance, :ethics and medical research Ethics of conducting medical	Understands the material	**1**	**-27 28**

		experiments in Iraqi health institutions			
Test and apply	Interactive	Convention on the Ethics of Medical Experiments. Ethics of writing medical research. Ethics of teaching and learning for patients.	Understands the material	**1**	**-29 30**

12. Infrastructure	
1- Required prescribed books	Training bag
2- Main references (sources)	
A-Recommended books and references (scientific journals, reports,...)	The official website of the Human Rights Organization
B - Electronic references, Internet sites...	The official website of Al-Ayen Iraqi University

13. Course development plan
The curriculum development plan is based on the following: 1. Giving the prescribed scientific material and observing and analyzing the students' results 2. Study feedback from students' comments about vocabulary 3. Comparing current vocabulary with the vocabulary of corresponding colleges in the field