



Course Specification

— (Bachelor)

Course Title: **Interventional Radiology**

Course Code: **374410-2**

Program: **Program of Bachelor in Radiological Sciences -374000-Level 6**

Department: **Department of Radiological Sciences**

College: **College of Applied Medical Sciences**

Institution: **Taif University**

Version: **3**

Last Revision Date: **4th September 2023**



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A. General information about the course:

1. Course Identification

1. Credit hours: (2)

2. Course type

A. University College Department Track Others

B. Required Elective

3. Level/year at which this course is offered: (7th Level / 4th Year)

4. Course general Description:

The course is designed to provide the student with basic knowledge of Interventional Radiology procedures. And students will learn unique and innovative treatment options available to patients in Interventional Radiology.

5. Pre-requirements for this course (if any):

- Special Radiographic Techniques (374316-3).
- Computerized Tomography Imaging Techniques (374317-3).
- Ultrasound Imaging Techniques (374323-3).

6. Co-requirements for this course (if any):

None

7. Course Main Objective(s):

By the end of the course the student should be able to:

- Explain the relationship between the materials and methods during interventional studies.
- Identify the body vessels in extremities, abdomen, brain and heart, and be able to account for the anatomy and physiology of the vessels.
- Explain the relationship between pathology and interventional approaches.
- Explain the use of current drugs and relate these to interventional examinations.
- Assist and apply an aseptic and sterile procedure in interventional examinations and treatments.
- Analyze nursing interventions and procedures in the preparation and aftercare of patients at different interventions.
- Reflect on various medical markers before and during various interventions.
- Reflect on risks involved in interventional procedures.
- Be aware with the interventional radiology procedures.
- Be aware with all related application in interventional radiology.





2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	32	100%
2	E-learning	-	-
3	Hybrid <ul style="list-style-type: none"> Traditional classroom E-learning 	-	-
4	Distance learning	-	-

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	32
2.	Laboratory/Studio	-
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
Total		32

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Summarize the basic information concerning interventional procedures.	K1	Lectures	Direct method: - Written exams - Quiz. - Assignment
2.0	Skills			
2.1	Choose the appropriate interventional procedures according to the patient condition.	S1	Small group discussion	Direct method: - Written exams - Quiz. - Assignment Indirect method: - Survey.
2.2	Illustrate the purpose, indication, and necessary patient preparation for each type of interventional procedures.	S5		Direct method: - Written exams - Quiz. - Assignment
3.0	Values, autonomy, and responsibility			
-	-	-	-	-



C. Course Content

No	List of Topics	Contact Hours
1.	<ul style="list-style-type: none"> • Introduction to Interventional Radiology Chapter 1-7 pages (3-36) (Essential References) 	2
2.	<ul style="list-style-type: none"> • Angiography. • Catheter Angiography. Chapter 1 pages (153-192) 	2
3.	<ul style="list-style-type: none"> • MR Angiography Chapter 70 pages (1682-1701) 	2
4.	<ul style="list-style-type: none"> • Angioplasty. Chapter 37 pages (1003-1019) 	2
5.	<ul style="list-style-type: none"> • IVC filter. • Stenting of the Great Vessels. Chapter 35 pages (954-985) 	2
6.	<ul style="list-style-type: none"> • Catheter Embolization. Chapter 23 pages (719-733) 	2
7.	<ul style="list-style-type: none"> • Chemoembolization. Chapter 25 pages (752-769) 	2
8.	<ul style="list-style-type: none"> • Cryotherapy. • Detachable coil embolization Chapter 7 pages (317-339) 	2
9.	<ul style="list-style-type: none"> • Transjugular Intrahepatic Portosystemic Shunt (TIPS). Chapter 40 pages (1057-1073) 	2
10.	<p>Tube / line insertion:</p> <ul style="list-style-type: none"> • Central venous catheters. • Nasogastric tubes. • Endotracheal tubes. Chapter 28/29/30 pages (807-855) 	2
11.	<p>Tube / line insertion:</p> <ul style="list-style-type: none"> • Intercostal chest drains. • Cardiac Pacemaker. • Dialysis lines. • Tracheostomy Tube. Chapter 31/32/33 pages (857-916) 	2
12.	<ul style="list-style-type: none"> • Needle biopsy of the lung (chest) nodules. Chapter 46 pages (1145-1161) 	2
13.	<ul style="list-style-type: none"> • Breast Biopsy. Chapter 9 pages (43-46) (Essential References) 	2
14.	<ul style="list-style-type: none"> • Radiofrequency Ablation of Liver Tumors. Chapter 24 pages (735-750) 	2
15.	<ul style="list-style-type: none"> • Endovenous Ablation of Varicose Veins. Chapter 42 pages (1089-1102) 	2
16.	<ul style="list-style-type: none"> • Vertebroplasty. Chapter 59 pages (1445-1458) 	2





Total

32

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz.	11 th	10%
2.	Mid-term Examination.	8 th	30%
3.	Assignment	16 th	10%
4.	Final Examination.	19 th	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Interventional Radiology: A Survival Guide Kessel D and Robertson, I 3 rd Edition Churchill Livingstone 2010 ISBN-13: 978-0702033896
Supportive References	Handbook of Interventional Radiology procedures. Kandarpa K, Machan L, Durham JD. 5 th Edition Wolters Kluwer 2016 ISBN-13: 978-1496302076
Electronic Materials	Saudi Digital Library (SDL) on Taif University website (through the Electronic Services portal - academic systems services).
Other Learning Materials	<ol style="list-style-type: none"> 1. http://user.shikoku.ne.jp/tobrains/exam/Angio/Angio-e.html 2. http://www.radiologyinfo.org/glossary/ 3. http://www.radsciresearch.org 4. http://www.radiography.com/ 5. http://www.jrcert.org 6. http://www.emory.edu/X-RAYS/Sprawls/ 7. http://www.dimag.com/



2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 30 seats.
Technology equipment (projector, smart board, software)	Projector. Smart Board.
Other equipment (depending on the nature of the specialty)	None.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders	Direct
Effectiveness of Students assessment	Students, Peer review	Direct, Indirect
Quality of learning resources	Student, Faculty	Indirect
The extent to which CLOs have been achieved	Faculty	Direct
Other Teaching and interaction with students	Students	Indirect

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	11TH
DATE	24TH MAY 2022





Course Specification

— (Bachelor)

Course Title: **Medical Imaging Interpretation (1)**

Course Code: **374327-2**

Program: **Program of Bachelor in Radiological Sciences -374000-Level 6**

Department: **Department of Radiological Sciences**

College: **College of Applied Medical Sciences**

Institution: **Taif University**

Version: **3**

Last Revision Date: **4th September 2023**



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A. General information about the course:

1. Course Identification

1. Credit hours: (2)

2. Course type

- A. University College Department Track Others
- B. Required Elective

3. Level/year at which this course is offered: (7th level/ 4th year)

4. Course general Description:

1. Describe the appearance of the pathology within the images. And allows the student to put an opinion in the image interpretation.
2. Discussion on which imaging method or modality will best demonstrate pathological condition.

5. Pre-requirements for this course (if any):

- Computerized Tomography Imaging Techniques (374317-3).
- Clinical Practice in Radiography (2) (374328-3).

6. Co-requirements for this course (if any):

None

7. Course Main Objective(s):

The course is designed to enable the student to:

1. Recognize the appearances of the different pathologies in the radiographic images.
2. Interpret the different radiographic images.
3. Know the differential diagnosis of pathologies in different radiological modalities.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	32	100%
2	E-learning	-	-
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 	-	-
4	Distance learning	-	-





3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	32
2.	Laboratory/Studio	-
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
Total		32

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Interpret medical terms for pathological conditions and diseases.	K3	Lectures	Direct: Midterm and final exams
2.0	Skills			
2.1	Choose appropriate radiographic technique to deliver best demonstration for pathologies and maximize diagnostic value.	S1	Small group discussion	Direct: Assignments. Indirect: Survey
2.2	Analyze radiographic appearance of common pathological conditions of body organs and human systems.	S2	Small group discussion	Direct: Assignments. Indirect: Survey
3.0	Values, autonomy, and responsibility			
3.1	Work collaboratively with team members when identifying pathological condition diagnostic measures.	V2	Self-learning	Direct: Presentation. Indirect: Survey
3.2	Conduct professional ethical standards in keeping	V1	Self-learning	Direct: Presentation. Indirect: Survey



Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
	The patient data and diagnosis discreet.			

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to image interpretation: (Chapter 1 , page No 1 of radiographic pathology for technologist) a. Radiographic Appearance. b. Procedural.	2
2.	Introduction to image interpretation: (Chapter 1 , page No 1 of radiographic pathology for technologist) a. Technique Considerations. b. Appropriate. Imaging Modality	2
3.	Skeletal and articular (1): (Chapter 2 , page No 21 of radiographic pathology for technologist) Congenital and hereditary diseases: a. Hand and foot malformations. b. Congenital dislocation of the hip.	2
4.	Skeletal and articular (1): (Chapter 2 , page No 21 of radiographic pathology for technologist) Congenital and hereditary diseases: a. Vertebral anomalies. Cranial anomalies.	2
5.	Skeletal and articular (2) (Chapter 2 , page No 41 of radiographic pathology for technologist) Traumatic disorders: a. Fractures. b. Dislocations.	2
6.	Revision	2
7.	Skeletal and articular (3) (Chapter 2 , page No 31 of radiographic pathology for technologist) Inflammatory diseases	2





	<ul style="list-style-type: none"> a. Osteomyelitis. b. Arthritis. c. Ankylosing Spondylitis. d. Osteoarthritis. 	
8.	<p>Skeletal and articular (4): (Chapter 7 , page No 44 of radiographic pathology for technologist)</p> <p>Metabolic Diseases:</p> <ul style="list-style-type: none"> a. Osteoporosis. b. Osteomalacia. <p>Paget's disease</p>	2
9.	<p>Skeletal and articular (5): (Chapter 7 , page No 44 of radiographic pathology for technologist)</p> <p>Neoplastic Diseases:</p> <ul style="list-style-type: none"> a. Aneurysmal Bone Cyst b. Osteochondroma (Exostosis) c. Osteosarcoma (Osteogenic Sarcoma) <p>Metastases from Other Sites</p>	2
10.	<p>The respiratory System: (Chapter 3 , page No 74,76 of radiographic pathology for technologist)</p> <p>2. Congenital and hereditary diseases:</p> <ul style="list-style-type: none"> a. Cystic fibrosis. <p>3. Inflammatory diseases:</p> <ul style="list-style-type: none"> a. Pulmonary Tuberculosis. b. Pneumoconiosis. c. Pleurisy. d. Occupational Lung Diseases. 	2
11.	<p>The abdomen and Gastrointestinal system (1): (Chapter 5 , page No 150 of radiographic pathology for technologist)</p> <p>Congenital and hereditary anomalies:</p> <ul style="list-style-type: none"> a. Esophageal Atresia. b. Esophageal web. c. Achalasia of esophagus. d. Esophageal varices. 	2
12.	<p>The abdomen and Gastrointestinal system (2): (Chapter 5 , page No 158, 170 of radiographic pathology for technologist)</p> <p>1. Inflammatory disease:</p> <ul style="list-style-type: none"> a. Esophageal strictures. b. Gastroesophageal reflux disease. c. Peptic ulcer. d. Ulcerative colitis. 	2





	2. Degenerative diseases: a. Herniation. b. Bowel obstruction.	
13.	The abdomen and Gastrointestinal system (3): (Chapter 5 , page No 183 of radiographic pathology for technologist) a. Diverticular disease. Neoplastic disease.	2
14.	The hepatobiliary system: (Chapter 6 , page No 205 of radiographic pathology for technologist) Inflammatory Diseases: a. Hepatitis. b. Cholecystitis. Jaundice.	2
15.	The hepatobiliary system: (Chapter 6 , page No 205 of radiographic pathology for technologist) Inflammatory Diseases: Cirrhosis Fatty Liver Disease	2
16.	The hepatobiliary system: (Chapter 6 , page No 209 of radiographic pathology for technologist) Neoplastic Diseases Hepatocellular Carcinoma (Hepatoma) Hemangioma Metastatic Liver Disease	2
Total		32

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm written exam	4 th - 5 th	30%
2.	Assignment (essay)	9 th	10%
3.	Presentation	10 th	10%
4.	Final written exam	18 th - 19 th	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).





E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	<ol style="list-style-type: none"> 1. Workbook for Comprehensive Radiographic Pathology. Eisenberg RL, Johnson NM. 4th ed. Mosby ISBN: 0323042198 2. Radiographic Pathology: Work book. Linn-Watson T. 2nd edition WB Saunders ISBN: 0721641695
Supportive References	RADIOGRAPHIC PATHOLOGY FOR TECHNOLOGISTS. NINA KOWALCZYK 6 th Edition. Mosby ISBN: 978-0-323-08902-9
Electronic Materials	<ol style="list-style-type: none"> 1. http://www.arrt.org 2. https://www.asrt.org/asrt.htm 3. http://www.auntminnie.com 4. http://www.air.asn.au 5. http://user.shikoku.ne.jp/tobrans/exam/Angio/Angio-e.html 6. http://chorus.rad.mcw.edu/ 7. http://www.emory.edu/X-RAYS/Sprawls/
Other Learning Materials	None.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 30 seats.
Technology equipment (projector, smart board, software)	Black board, Projector and Smart Board.
Other equipment (depending on the nature of the specialty)	None.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders	Direct
Effectiveness of Students assessment	Students, peer review	Direct, Indirect
Quality of learning resources	Student, Faculty	Indirect
The extent to which CLOs have been achieved	Faculty	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)





G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	11 TH
DATE	24 TH MAY 2022





Course Specification

— (Bachelor)

Course Title: **Magnetic Resonance Imaging Techniques**

Course Code: **374411-3**

Program: **Program of Bachelor in Radiological Sciences -374000-Level 6**

Department: **Department of Radiological Sciences**

College: **College of Applied Medical Sciences**

Institution: **Taif University**

Version: **3**

Last Revision Date: **4th September 2023**



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A. General information about the course:

1. Course Identification

1. Credit hours: (3)

2. Course type

A. University College Department Track Others

B. Required Elective

3. Level/year at which this course is offered: (7th Level / 4th Year)

4. Course general Description:

This course is designed to introduce the students to the clinical application of MRI. It will permit the student to develop the necessary skills to produce quality MRI images. Focus on MRI procedures, patient care and MRI protocols will be emphasized.

5. Pre-requirements for this course (if any):

Magnetic Resonance Imaging Physics and Instrumentation (374413-3)

6. Co-requirements for this course (if any):

None

7. Course Main Objective(s):

To build up knowledge and skills necessary to perform techniques of magnetic resonance imaging.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	64	100%
2	E-learning	-	-
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 	-	-
4	Distance learning	-	-



3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	32
2.	Laboratory/Studio	32
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
Total		64

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Identify anatomy, physiology and pathology of the human body.	K1	Lectures, Small groups discussions	Direct method: Written (Mid-term, final and practical exams)
1.2	Describe the cause and appearance of MR artifacts.	K2	Lectures, Small groups discussions	
1.3	Explain MR contrast agents and describe their usage in the clinical settings.	K3	Lectures, Small groups discussions	
2.0	Skills			
2.1	Choose the appropriate techniques according to the patient's condition.	S1	Lectures, Small groups discussions	Direct method: Written (Mid-term, final and practical exams), Presentation and discussion. Indirect method: survey
2.2	Identify common MR procedures.	S2	Lectures, Small groups discussions	
2.3	Communicate effectively when discussing the suitability of the diagnostic imaging with patient	S4	Lectures, Small groups discussions	
3.0	Values, autonomy, and responsibility			
3.1	Demonstrate participation skills in teamwork effectively.	V2	Group work	Direct method: Presentation and discussion.





C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to the course Chapter: 2,3,4,7,9,10 – Pages: 81-245, 369-420, 581-622 (Textbook-1)	4
2.	Artefacts and their compensation Chapter: 8 – Pages: 421-482 (Textbook-1) Chapter: 4 – Pages 38-40 (Textbook-2)	4
3.	Flow artefacts Chapter: 8 – Pages 483-507 (Textbook-1) Chapter: 4 – Pages 34-37 (Textbook-2)	4
4.	MR contrast agents Chapter: 2 – Pages 133-134 (Textbook-1) Chapter: 7 – Pages 55-58 (Textbook-2)	4
5.	Central Nervous System (Brain -1): a. Clinical indications b. Anatomic Location c. Imaging Protocol Chapter: 8 – Pages 63-106 (Textbook-2)	4
6.	Practical session Central Nervous System (Brain -1) Chapter: 8 – Pages 63-106 (Textbook-2)	4
7.	Central Nervous System (Brain - 2): a. Clinical indications b. Anatomic Location c. Imaging Protocol Chapter: 8 – Pages 63-106 (Textbook-2)	4
8.	Practical session Central Nervous System (Brain -2) Chapter: 8 – Pages 63-106 (Textbook-2)	4
9.	1. Central Nervous System (Spine and spinal cord): a. Clinical indications b. Anatomic Locations c. Imaging Protocol Chapter: 9 – Pages 140-170 (Textbook-2)	4
10.	Practical session Central Nervous System (Spine and spinal cord) Chapter: 9 – Pages 140-170 (Textbook-2)	4
11.	1. Musculoskeletal (knee and shoulder): a. Clinical indications b. Anatomic Locations c. Imaging Protocol Chapter: 13, 14 – Pages 261-272, 314-324 (Textbook-2)	4
12.	Practical session Musculoskeletal (knee and shoulder) Chapter: 13, 14 – Pages 261-272, 314-324 (Textbook-2)	4
13.	Abdominal Imaging Chapter: 9 – Pages 219-238 (Textbook-2)	4
14.	Vascular Imaging Chapter: 8 – Pages: 508-526 (Textbook-1) Chapter: 8, 11, 14 – Pages 133-137, 239-242, 343-349 (Textbook-2)	4
15.	Breast Imaging	4





	Chapter: 10 – Pages 198-212 (Textbook-2)	
16.	Revision	4
Total		64

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Mid-Term Exam	6 th	30%
2.	Presentation	12 th	10%
3.	Practical Exam	14 th	10%
4.	Final Exam	17 th	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Textbook-1 MRI in practice Catherine Westbrook, John Talbot 5th edition Wiley Blackwell ISBN: 978-1-119-39200-2 Textbook-2 Handbook of MRI Technique Catherine Westbrook 3rd edition Wiley Blackwell ISBN: 978-1405160858
Supportive References	None
Electronic Materials	*Link for the course at Blackboard Learn Portal on Taif university webpage (https://lms.tu.edu.sa/webapps/login/). *Saudi Digital Library (SDL) on Taif University website (through the Electronic Services portal - academic systems services). * Radiopaedia.org , the peer-reviewed collaborative radiology resource
Other Learning Materials	None





2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms, MRI lab
Technology equipment (projector, smart board, software)	Data show, Blackboard and A/V
Other equipment (depending on the nature of the specialty)	MRI Simulator

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders	Direct
Effectiveness of Students assessment	Student	Indirect
Quality of learning resources	Student, Faculty	Indirect
The extent to which CLOs have been achieved	Faculty	Indirect
Other	Students, peer review	Direct, Indirect

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	11TH
DATE	24TH MAY 2022





Course Specification

— (Bachelor)

Course Title: **Nuclear Medicine Imaging Techniques**

Course Code: **374412-3**

Program: **Program of Bachelor in Radiological Sciences-374000-Level 6**

Department: **Department of Radiological Sciences**

College: **College of Applied Medical Sciences**

Institution: **Taif University**

Version: **3**

Last Revision Date: **4th September 2023**



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A. General information about the course:

1. Course Identification

1. Credit hours: (3)

2. Course type

A. University College Department Track Others

B. Required Elective

3. Level/year at which this course is offered: (7th Level / 4th year)

4. Course general Description:

The course provides subjects that describe the principles of nuclear medicine techniques and imaging. The course also demonstrates the nuclear medicine imaging procedures.

5. Pre-requirements for this course (if any):

- Nuclear Medicine Physics and Instrumentation (374322-3).
- Pathology (374314-4).

6. Co-requirements for this course (if any):

None

7. Course Main Objective(s):

The course is designed to provide student with the principles of nuclear medicine imaging technology.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	64	100%
2	E-learning	-	-
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 	-	-
4	Distance learning	-	-



3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	32
2.	Laboratory/Studio	32
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
Total		64

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment methods
1.0	Knowledge and understanding			
1.1	Describe the imaging protocols for the common radioisotope procedures.	K2	Lectures	Direct method: 1.Quiz 2.Midterm exam 3.Final exam Indirect method: Survey
1.2	Explain radiopharmaceuticals, their delivery and activity administrated.	K3	Lectures	Direct method: 1.Quiz 2.Midterm exam 3.Final exam Indirect method: Survey
2.0	Skills			
2.1	Plan for the appropriate radioisotope imaging procedures.	S1	Small group discussion	Direct method: 1.Case study 2.Practical Report Indirect method: Survey
2.2	Categorize radioisotope scanning findings (normal or abnormal).	S1	Small group discussion	Direct method: 1.Case study 2.Practical Report Indirect method: Survey
3.0	Values, autonomy, and responsibility			
3.1	Work collaboratively with patients and staff.	V2	Group work	Direct method: Oral examination Indirect method: Survey



C. Course Content

No	List of Topics	Contact Hours
1.	1. Introduction to radioisotope imaging. Chapter 2, Pages 23- 70	4
2.	2. The skeletal imaging: Bone scan. Chapter 8, Pages 271- 312	4
3.	The cardiovascular system: Myocardial perfusion imaging (1) Chapter 5, Pages 131 - 191	4
4.	The cardiovascular system: Myocardial perfusion imaging (2) Chapter 5, Pages 131 - 191	4
5.	The respiratory system: Lung perfusion scan. Chapter 6, Pages 195- 222	4
6.	The respiratory system: Lung ventilation scan. Chapter 6, Pages 195- 222	4
7.	The urinary system: Renal perfusion. Chapter 9, Pages 315- 328	4
8.	The urinary system: Radionuclide cystography. Chapter 9, Pages 339- 341	4
9.	Endocrine Imaging: Thyroid imaging. Chapter 4, Pages 99- 144	4
10.	Endocrine Imaging: Radionuclide thyroid uptake. Chapter 4, Pages 99- 144	4
11.	Endocrine Imaging: Radionuclide therapy. Chapter 4, Pages 99- 144	4
12.	The hepato-biliary system: Liver. Chapter 7, Pages 237- 245, 249 - 261	4
13.	The hepato-biliary system: Splenic. Chole-scintigraphy. Chapter 7, Pages 237- 245, 249 - 261	4
14.	The central nervous system: Conventional brain scan and Regional Cerebral Blood Flow Imaging. Chapter 3, Pages 71- 90	4
15.	The central nervous system: Brain PET scan. Chapter 3, Pages 71- 90	4
16.	General Revision	4
Total		64





D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz	6 th	10%
2.	Midterm written exam	8 th	30%
3.	Case study & Practical Report	14 th -15 th	10%
...	Final written Exam	18 th	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Essentials of nuclear medicine imaging Fred A. Mettler Jr., Milton J. Guiberteau. 6th Edition 2012 Saunders ISBN: 978-1-4557-0104-9
Supportive References	Nuclear Medicine and Pet/CT: Technology and Techniques David Gilmore, Kristen M. Waterstram-Rich Mosby August 29th, 2016 ISBN: 9780323356220
Electronic Materials	<ol style="list-style-type: none"> http://www.radiography.com/ http://www.radiologyinfo.org/glossary/ http://www.aeirs.org/resources.html http://www.emory.edu/X-RAYS/Sprawls/ http://www.dimag.com/
Other Learning Materials	https://www.radiologycafe.com/frcr-physics-notes/molecular-imaging/gamma-camera/

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ul style="list-style-type: none"> Lecture room with 30 seats. Equipment laboratory. Hot lab laboratory (Nuclear medicine department).
Technology equipment (projector, smart board, software)	Data Show.



Items	Resources
<p>Other equipment (depending on the nature of the specialty)</p>	<ul style="list-style-type: none"> • Radioactive generators. • Radioactive dose calibrators. • Radioactive detectors. • Radioactive sources. • Nuclear medicine imaging simulator.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment methods
Effectiveness of teaching	Program Leaders	Direct
Effectiveness of Students assessment	Students, peer review	Direct, Indirect
Quality of learning resources	Student, Faculty	Indirect
The extent to which CLOs have been achieved	Faculty	Direct
Other	N\A	N\A

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	11 TH
DATE	24 TH MAY 2022





Course Specification

— (Bachelor)

Course Title: **Radiotherapy Techniques**

Course Code: **374418-2**

Program: **Program of Bachelor in Radiological Sciences -374000-Level 6**

Department: **Department of Radiological Sciences**

College: **College of Applied Medical Sciences**

Institution: **Taif University**

Version: **3**

Last Revision Date: **4th September 2023**



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A. General information about the course:

1. Course Identification

1. Credit hours: (2)

2. Course type

A. University College Department Track Others
B. Required Elective

3. Level/year at which this course is offered: (7th Level/4th Year)

4. Course general Description:

The course prepares students to apply different radiation therapy modalities in treatment of different tumors through study of techniques used for simulation and treatment delivery, with attention given to technical details aimed at optimizing the dose delivery planned during simulation and accomplished during treatment.

5. Pre-requirements for this course (if any):

Basics of Radiotherapy 374329-2

6. Co-requirements for this course (if any):

None

7. Course Main Objective(s):

The course is designed to enable the student to:

1. Recognize the principles of clinical radiation therapy.
2. Applying different radiotherapy treatment techniques using different radiotherapy modalities for treatment of tumors.
3. Identify the healthy tissue tolerances and the possible side effects of radiotherapy treatment.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	32	100%-
2	E-learning	-	-
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 	-	-
4	Distance learning	-	-



3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	32
2.	Laboratory/Studio	-
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
Total		32

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Illustrate the principles of care and safety for clinical external and internal radiotherapy treatments.	K3	Lectures	Direct Written Exams(Quizzes, midterm and final exams).
2.0	Skills			
2.1	Choose appropriate radiotherapy techniques, planning, immobilization, localization, and treatment approaches.	S1	Small group discussion	Direct Assignment Indirect Survey
2.2	Analyze possible side effects of radiotherapy treatment, healthy tissue tolerances, and the psychological problems associated with a malignancy.	S2	Small group discussion	Direct Assignment Indirect Survey
3.0	Values, autonomy, and responsibility			





C. Course Content

No	List of Topics	Contact Hours
1.	Introduction and Overview of the curriculum	2
2.	Radiotherapy techniques for Skin and lip cancer I. (Chapter 20, page No 317-325 Textbook of Radiotherapy)	2
3.	Radiotherapy techniques for Skin and lip cancer II. (Chapter 20, page No 326-339 Textbook of Radiotherapy)	2
4.	Radiotherapy techniques for Head and neck cancer. (Chapter 21, page No 317-339 Textbook of Radiotherapy)	2
5.	Radiotherapy Techniques for Nasopharynx cancer. (Chapter 22, page No 341-355 Textbook of Radiotherapy)	2
6.	Radiotherapy techniques for Gastrointestinal cancer. (Chapter 24, page No 357-384 Textbook of Radiotherapy)	2
7.	Radiotherapy techniques for Breast cancer. (Chapter 26, page No 431-465 Textbook of Radiotherapy)	2
8.	Radiotherapy techniques for Gynecological cancer (Carcinoma of cervix). (Chapter 27, page No 467-477 Textbook of Radiotherapy)	2
9.	Radiotherapy techniques for Gynecological cancer (Endometrial Carcinoma) Chapter 27, page No 478-483 Textbook of Radiotherapy)	2
10.	Radiotherapy techniques for Prostate cancer. (Chapter 28, page No 493-499 Textbook of Radiotherapy)	2
11.	Radiotherapy techniques for Lymphoma. (Chapter 29, page No 511-527 Textbook of Radiotherapy)	2
12.	Radiotherapy techniques for Pediatric oncology I (Chapter 33, page No 585-593 Textbook of Radiotherapy)	2
13.	Radiotherapy techniques for Pediatric oncology II (Chapter 33, page No 594-600 Textbook of Radiotherapy)	2
14.	Radiation safety and quality assurance for radiotherapy techniques Radiation Safety: Quality Assurance in Radiotherapy. SESLHDPR/532. 2023	2
15.	Care of patients during radiotherapy Chapter 34, page No 601-609 Textbook of Radiotherapy)	2
16.	General Revision	2
Total		32

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm written exam	(7 th -8 th)	30%
2.	Assignment	5 th	10%
3.	Quizzes	12 th	10%
4.	Final written exam	(17 th - 18 th)	50%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).



E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Principles and Practice of Radiation Oncology Perez & Brady's 7th Edition Wolters Kluwer ISBN: 9781496386823 Practical Radiotherapy Planning Ann Barrett and Jane Dobbs Hodder Arnold 6 6 ISBN: 978 034 0927731
Supportive References	Textbook of Radiotherapy Walter and Miller's Paul Symonds, Charles Deehan, John A. Mills 7 th Edition Elsevier ISBN: 978 0 443 07486 8
Electronic Materials	https://apps.tu.edu.sa/sdl/default.aspx
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 30 seats.
Technology equipment (projector, smart board, software)	Black board, Projector and Smart Board.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders	Direct
Effectiveness of Students assessment	Students, peer review	Direct, Indirect
Quality of learning resources	Student, Faculty	Indirect
The extent to which CLOs have been achieved	Faculty	Direct
Others		
Course management and planning	Students	Indirect
Teaching and interaction with students	Students	Indirect

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)





G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	11 TH
DATE	24 TH MAY 2022





Field Experience Specification

Course Title: **Advanced Clinical Practice (1)**

Course Code: **374415-4**

Program: **Program of Bachelor in Radiological Sciences -374000-Level 6**

Department: **Department of Radiological Sciences**

College: **College of Applied Medical Sciences**

Institution: **Taif University**

Field Experience Version Number: **3**

Last Revision Date: **4th September 2023**



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A. Field Experience Details:

1. Credit hours: (4).

2. Level/year at which Field Experience is offered: (7th Level / 4th Year).

3. Time allocated for Field Experience activities

(16) Weeks	Wednesday for girls Sunday for boys	(8) Hours
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4. Corequisite (or prerequisites if any) to join Field Experience

Computerized Tomography Imaging Techniques (374317-3).
Ultrasound Imaging Techniques (374323-3).
Clinical Practice in Radiography (2) (374328-3).

5. Mode of delivery

In-person/onsite hybrid (onsite/online) Online

B. Field Experience Course Learning Outcomes (CLOs), Training Activities and Assessment Methods

Code	Learning Outcomes	Aligned PLO Code	Training Activities	Assessment Methods	Assessment Responsibility
1.0	Knowledge and understanding				
1.1	--				
2.0	Skills				
2.1	Communicate effectively with patient during CT, US procedures with or without contrast media in a skilled and safe way.	S4	Problem solving Problem-based learning Practical Training	Continuous Assessment. Logbook assessment Practical Exam OSPE	Department teaching staff. Field Supervisor. Students.
2.2	Choose appropriate techniques with proper care according to patient's condition.	S1	Problem solving Problem-based learning Practical Training	Continuous Assessment. Logbook assessment Practical Exam OSPE	Department teaching staff. Field Supervisor. Students.





Code	Learning Outcomes	Aligned PLO Code	Training Activities	Assessment Methods	Assessment Responsibility
2.3	assess images accurately with high quality for CT, US examinations.	S2	Problem solving Problem-based learning Practical Training	Continuous Assessment. Logbook assessment Practical Exam OSPE	Department teaching staff. Field Supervisor. Students.
2.4	Analyze informed decisions about clinical practice within the accepted departmental protocols.	S3	Problem solving Problem-based learning Practical Training	Indirect:- (survey)	Department teaching staff. Field Supervisor. Students.
2.5	Take part in operating CT, US machines properly.	S5	Problem-solving Problem-based learning Practical Training	Continuous Assessment. Logbook assessment Practical Exam OSPE	Department teaching staff. Field Supervisor. Students.
3.0	Values, autonomy, and responsibility				
3.1	Adapt the ethical profession as honesty, respect, patient care and infection control.	V1	Collaborative learning Self-learning	Presentation	Department teaching staff. Field Supervisor. Students.
3.2	Collaborate effectively with patients and health staff during basic radiation protection and safety measures	V2	Collaborative learning Self-learning	Presentation	Department teaching staff. Field Supervisor. Students.
...					

*Assessment methods (i.e., practical test, field report, oral test, presentation, group project, essay, etc.).

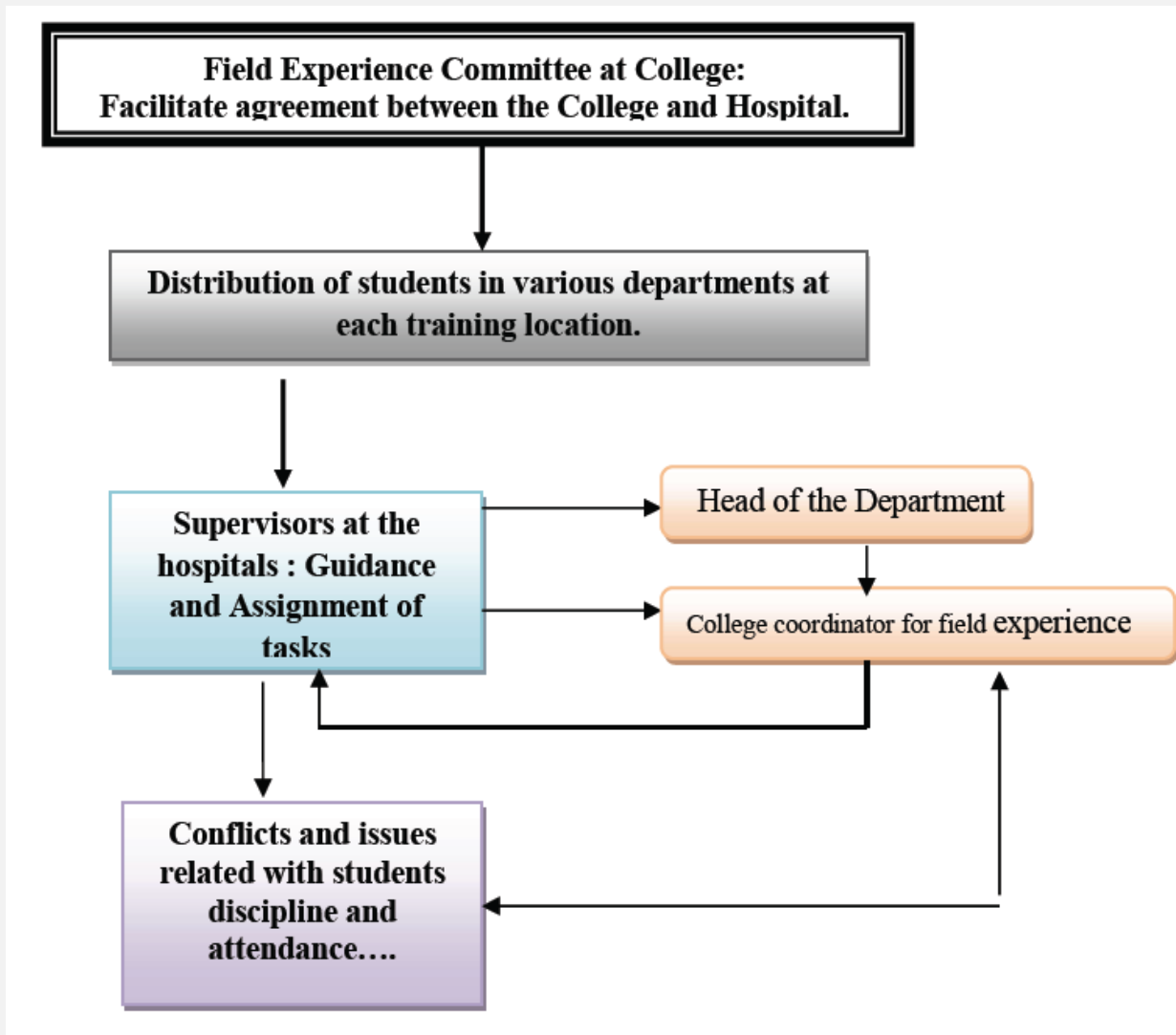


C. Field Experience Administration

1. Field Experience Flowchart for Responsibility

Including units, departments, and committees responsible for field experience identifying by the interrelations.

- Confidential instructor evaluation questionnaire on completion of the course.
- Student interview.
- Student feedback report to be analyzed by the course instructor and submit the results to the department head.
- External evaluators.



2. Distribution of Responsibilities for Field Experience Activities

Activities	Department or College	Teaching Staff	Student	Training Organization	Field Supervisor
Selection of a field experience site	√	√		√	√
Selection of supervisory staff	√	√		√	√
Provision of the required equipment	√	√		√	√
Provision of learning resources	√	√			√
Ensuring the safety of the site	√	√		√	√
Commuting to and from the field experience site			√		
Provision of support and guidance		√		√	√
Implementation of training activities (duties, reports, projects ...)		√			√
Follow up on student training activities		√		√	√
Monitoring attendance and leave		√		√	√
Assessment of learning outcomes		√			√
Evaluating the quality of field experience	√	√	√	√	√
Others (specify)	-	-	-	-	-

3. Field Experience Location Requirements

Suggested Field Experience Locations	General Requirements*	Special Requirements**
King Abdul-Aziz Specialist Hospital.	Training letter. Student ID. Medical Uniform. TLD. Proper appearance.	None.
King Faisal Specialist Hospital.		None.
Children's Hospital at Taif.		Infection control certificate.
Al-Hada Military Hospital.		Training application
Prince Mansoor Military Hospital.		Security check.
Prince Sultan Military Hospital.		Training application
		Security check.

*E.g. provides information technology, equipment, laboratories, halls, housing, learning sources, clinics ... etc.

** E.g. Criteria of the institution offering the training or those related to the specialization, such as safety standards, dealing with patients in medical specialties ... etc.



4. Decision-Making Procedures for Identifying Appropriate Locations for Field Experience

- Start with a meeting with the faculty teaching staff, discussing the main objectives of the trainee rounds and making some suggestions.
- Hospitals are chosen for capacity, availability of radiological modalities, and located within Taif city.
- Students are distributed according to the hospitals' capacity.

5. Safety and Risk Management

Potential Risks	Safety Actions	Risk Management Procedures
Isolation of highly infected patients.	<ul style="list-style-type: none"> - Avoid direct contact with the patient. - Avoid direct contact with contaminated areas (e.g. pressure ulcer). - Wear face mask, gloves, overhead and overshoes cover. 	<ul style="list-style-type: none"> - Enforce student's knowledge in infection control.
Radiation exposure.	<ul style="list-style-type: none"> - Always keep in shielded environment or wear shielding garment. - Keep a safe distance from the radiation source. - Minimize the exposure time as low as possible. - Apply ALARA (as low as reasonably achievable) principle. - Monitor your radiation dose regularly. 	<ul style="list-style-type: none"> - Enforce students' knowledge in radiation protection training. - Personal dosimeters.





D. Training Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching	Training Committee	Direct
The extent of achievement of course learning outcomes	Faculty	Direct
Quality of learning resources	Student, Faculty	Indirect
Course management and planning	Students	Indirect
Teaching and interaction with students	Students	Indirect
Effectiveness of Evaluation and exams	Students, peer review	Direct, Indirect
Safety	Teaching Staff, Field Supervisors	Direct
Training facilities/site	Students, Faculty	Direct, Indirect

Evaluation areas (e.g., Effectiveness of Training and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Supervisory Staff, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

E. Specification Approval Data

Council /Committee	DEPARTMENT COUNCIL
Reference No.	11 TH
Date	24 TH MAY 2022

