



# Course Specification

— (Bachelor)

**Course Title:** Special Radiographic Techniques

**Course Code:** 374316-3

**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:** 4 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: (5<sup>th</sup> Level / 3<sup>rd</sup> Year)

#### 4. Course general Description:

This course is designed to enable the students to practice contrast media examination, as well as focusing on pharmacology principles, physiology of the vascular system, types and makeup of various types of contrast media, routes of contrast media administration, administration of contrast guidelines, reactions to contrast media and emergency treatments of contrast media reactions..

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

- Diagnostic Radiography Instrumentation (374226-3).

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

None

#### 7. Course Main Objective(s):

The course is designed to provide the students with the knowledge necessary to perform contrast media imaging procedures for all body systems. Consideration is given to the evaluation of optimal diagnostic images.

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	48	100%
2	E-learning	-	-
3	Hybrid <ul style="list-style-type: none"> <li>• Traditional classroom</li> <li>• E-learning</li> </ul>	-	-
4	Distance learning	-	-





### 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	48
2.	Laboratory/Studio	-
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
<b>Total</b>		<b>48</b>

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

Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Outline different types of contrast media used in radiology department and state special considerations for contrast media reactions.	<b>K1</b>	Lectures	Direct method: written exam (Quiz, mid and final exams) and assignment
1.2	Summarize the clinical indications, standard terminology, and abbreviations of positioning of all examinations with contrast media.	<b>K2</b>	Lectures	Direct method: written exam (Quiz, mid and final exams).
1.3	Demonstrate the contrast media radiographic procedures and know the normal and abnormal radiographic appearance of performed examination.	<b>K3</b>	Lectures	Direct method: written exam (Quiz, mid and final exams) and
<b>2.0</b>	<b>Skills</b>			
2.1	Utilize all basic and modified radiographic examinations with contrast media and interpret radiographic positioning according to the patient medical condition.	<b>S1</b>	Small group discussion	Indirect method: - Surveys.
2.2	Identify the correct instructions for patient positioning to help for	<b>S2</b>	Problem based learning	Direct: - Assignment



Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
	radiation protection and improve image quality during examinations with contrast media.			
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
-	-	-	-	-

### C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Special Radiographic Techniques: a. Fluoroscopic equipment. b. Patient preparation and patient care. c. Radiation protection. Section 1 (pages 11-29) Textbook 2	3
2.	Drugs and contrast agents in Radiography Chapter 2 (pages 30-46) Textbook 2	3
3.	Genitourinary system (1): IVU: <ul style="list-style-type: none"> <li>Anatomy.</li> <li>Procedures.</li> </ul> Chapter 14 (pages 526-561) Textbook 1	3
4.	Retrograde urography Chapter 14 (pages 526-561) Textbook 1	3
5.	Genitourinary system (2): HSG: <ul style="list-style-type: none"> <li>Anatomy.</li> <li>Procedures.</li> </ul> Chapter 19 (pages 718 -722) Textbook 1	3
6.	The digestive system (1) UGIT: <ul style="list-style-type: none"> <li>Barium swallow.</li> <li>Barium meal.</li> </ul> Chapter 12 (pages 453-487) Textbook 1	3
7.	The digestive system (2) LGIT: <ul style="list-style-type: none"> <li>Barium follow-through.</li> </ul> Chapter 13 (pages 489 -597) Textbook 1	3





8.	The digestive system (2) LGIT: • Barium enema. Chapter 13 (pages 400 -524) Textbook 1	3
9.	The biliary system: a. Anatomy. b. Procedures. Chapter 12 (pages 446-449) Textbook 1	3
10.	Arthrogram Chapter 19 (pages 711 -717) Textbook 1	3
11.	Myelogram Sialogram Chapter 19 (pages 718 -727) Textbook 1	3
12.	Angiographic procedures. Chapter 17 (pages 650-669) Textbook 1	3
13.	Angiographic procedures. Chapter 17 (pages 657-673) Textbook 1	3
14.	Lymphography procedures. Chapter 17 (pages 660-682) Textbook 1	3
15.	DEXA scan. Chapter 20 (pages 766 -771) Textbook 1	3
16.	Revision	3
<b>Total</b>		<b>48</b>

#### D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz.	10 <sup>th</sup>	10%
2.	Mid-term Examination.	7 <sup>th</sup>	30%
3.	Assignment (Long essays).	14 <sup>th</sup>	10%
4.	Final Examination.	18 <sup>th</sup>	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

<b>Essential References</b>	Bontrager`s, Textbook for Radiographic Positioning & Related Anatomy John P. Lampignano, Leslie E. Kendrick,
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	9th Edition Elsevier 2018 ISBN: 978-0-323-39966-1
<b>Supportive References</b>	None.
<b>Electronic Materials</b>	Saudi Digital Library (SDL) on Taif University website (through the Electronic Services portal - academic systems services).
<b>Other Learning Materials</b>	<ol style="list-style-type: none"> <li>1. <a href="http://www.radiologyinfo.org/glossary/">http://www.radiologyinfo.org/glossary/</a></li> <li>2. <a href="http://www.radsciresearch.org">http://www.radsciresearch.org</a></li> <li>3. <a href="http://www.radiography.com/">http://www.radiography.com/</a></li> <li>4. <a href="http://www.jrcert.org">http://www.jrcert.org</a></li> <li>5. <a href="http://www.emory.edu/X-RAYS/Sprawls/">http://www.emory.edu/X-RAYS/Sprawls/</a></li> </ol>

## 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 30 seats.
<b>Technology equipment</b> (projector, smart board, software)	Projector. Smart Board.
<b>Other equipment</b> (depending on the nature of the specialty)	Samples of different contrast media types..

## 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

<b>COUNCIL /COMMITTEE</b>	DEPARTMENT COUNCIL
<b>REFERENCE NO.</b>	11 <sup>TH</sup>
<b>DATE</b>	24 <sup>TH</sup> MAY 2022





# Course Specification

— (Bachelor)

Course Title: **Computerized Tomography Imaging Techniques**

Course Code: **374317-3**

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: **4<sup>th</sup> 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: (5<sup>th</sup> Level / 3<sup>rd</sup> Year)

#### 4. Course general Description:

The course is designed to develop knowledge and skills necessary to perform computerized tomography procedures that include, patient history and assessment, indications for procedure, patient education, scan preparation, preferred orientation and positioning, contrast media use, selectable scan parameters, scout image, filming and archiving of image. The imaging technique for each organ/ region to match the criteria for diagnostic image and modification of technique in clinical condition that affects image quality. Evaluation of image for any artifact, quality, anatomy and pathology. Assignment to CT facility to provide students with the opportunity to observe, assist and perform CT procedures under supervision and guidance of qualified CT specialist.

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

- Computerized Tomography Physics and Instrumentation (374222-3).
- Pathology (374314-4).

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

None

#### 7. Course Main Objective(s):

This course aims to estimate the appropriate CT procedures according to the patient condition explain the purpose, indication, and necessary patient preparation for each type of CT examinations and illustrate effective communication skills with the patient and other health staff and explain the concepts of principle of each procedure to the patient.

### 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"> <li>• Traditional classroom</li> <li>• E-learning</li> </ul>		
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)	-
<b>Total</b>		<b>48</b>

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

Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Explain computerized tomography principles and recall the important patient preparation prior to compute tomography procedures.	<b>K1</b>	Lectures	Indirect: Survey.
<b>2.0</b>	<b>Skills</b>			
2.1	Apply the appropriate technique according to the patient condition.	<b>S1</b>	Lectures Small group discussion	Direct: Assignments. Indirect: Survey.
2.2	Communicate effectively when explaining the purpose, indication, and necessary patient preparation information for each type of CT examinations	<b>S4</b>	Lectures Small group discussion	Direct: Assignments. Indirect: Survey
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	Collaborate effectively with the patient and other health staff.	<b>V2</b>	Small group discussion	Direct: Presentation. Indirect: Survey



## C. Course Content

No	List of Topics	Contact Hours
1.	Introduction (Chapter: (1, 2, 3, 12, 13) - Pages 03 - 40 and 120 - 142 (Computed Tomography for Technologist).	4
2.	Procedure's element. & Contrast Media. Practical session Chapter: (1, 2, 3, 12, 13) - Pages 03 - 40 and 120 - 142 (Computed Tomography for Technologist)	4
3.	CT Skull Techniques (1). Practical session Chapter: 15 - Pages 183 - 204 (Computed Tomography for Technologist).	4
4.	CT Skull Techniques (2) Practical session Chapter 19 - Pages 239 - 250 (Computed Tomography for Technologist)..	4
5.	CT Neck. Practical session. Chapter 16 - Pages 204 - 214 (Computed Tomography for Technologist).	4
6.	CT Neck. Practical session. Chapter 16 - Pages 204 - 214 (Computed Tomography for Technologist).	4
7.	Trunk CT (1): Chest Scan. Practical session. Chapter 20 - Pages 267 – 299 (Computed Tomography for Technologist)	4
8.	Cardiac CT Practical session. Chapter 20 - Pages 267 – 299 (Computed Tomography for Technologist)	4
9.	Trunk CT (2): Abdomen. Practical session. Chapter 21 - Pages 300 - 324 (Computed Tomography for Technologist)	4
10.	Trunk CT (3): Pelvis Scan. Practical session. Chapter 21 - Pages 325 - 335 (Computed Tomography for Technologist).	4
11.	Musculoskeletal CT. Chapter: 17 - Pages 215 - 224 (Computed Tomography for Technologist).	4
12.	Vertebral Column:	4





	Practical session. Chapter: 22 - Pages 335 - 345 (Computed Tomography for Technologist).	
13.	Vertebral Column: Practical session. Chapter: 22 - Pages 335 - 345 (Computed Tomography for Technologist).	4
14.	Advanced CT techniques (1). Practical session. Chapter: 23 - Pages 345 - 348 (Computed Tomography for Technologist).	4
15.	Advanced CT techniques (2). 2. Practical session. Chapter: 23 - Pages 345 - 348 (Computed Tomography for Technologist).	4
16.	Advanced CT techniques.(3) 2. Practical session. Chapter: 23 - Pages 345 - 348 (Computed Tomography for Technologist).	4
<b>Total</b>		<b>64</b>

#### D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Mid-term written exam	7 <sup>th</sup> & 8 <sup>th</sup>	30%
2.	Assignment	10 <sup>th</sup>	10%
3.	Final practical exam	17 <sup>th</sup>	20%
...	Final written exam	18 <sup>th</sup> - 19 <sup>th</sup>	40%

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

#### E. Learning Resources and Facilities

##### 1. References and Learning Resources

<b>Essential References</b>	Computed Tomography for Technologist: a comprehensive text Lois E. Romans. 1st Edition Publisher: Wolters Kluwer Health Lippincott Williams & Wilkins ISBN: 978-0-7817-7751-3 Published Date: 2011
<b>Supportive References</b>	Computed tomography: physical principles, clinical applications, and quality control. Euclid Seeram. 3rd edition. Publisher: Elsevier





	ISBN: 978-1-4160-2895-6 Published Date: 2009
Electronic Materials	*Link for the course at Blackboard Learn Portal on Taif university webpage ( <a href="https://lms.tu.edu.sa/webapps/login/">https://lms.tu.edu.sa/webapps/login/</a> ). *Saudi Digital Library (SDL) on Taif University website (through the Electronic Services portal - academic systems services).
Other Learning Materials	Nona

## 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom with 25 seats
<b>Technology equipment</b> (projector, smart board, software)	Blackboard. Projector
<b>Other equipment</b> (depending on the nature of the specialty)	Videos

## 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.	11 <sup>TH</sup>
DATE	24 <sup>TH</sup> MAY 2022





# Course Specification

— (Bachelor)

**Course Title:** General Radiographic Techniques and Radiographic Anatomy (2)

**Course Code:** 374313-4

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

**Department:** Department of Radiological Sciences

**College:** College of Applied Medical Sciences

**Institution:** Taif University

**Version:** 3

**Last Revision Date:** *Pick Revision Date.*



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## A. General information about the course:

### 1. Course Identification

1. Credit hours: ( 4 )

#### 2. Course type

A.  University  College  Department  Track  Others  
 B.  Required  Elective

3. Level/year at which this course is offered: (5<sup>th</sup> Level / 3<sup>rd</sup> Year)

#### 4. Course general Description:

The course is designed to provide the student with the knowledge base necessary to perform standard imaging procedures with certain terminologies and abbreviations for the cranium, chest (upper airway, heart and lungs) and abdominal viscera. The contents also provide the students with the skills to perform facial and dental radiography and mammography as well.

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

General Radiographic Techniques and Radiographic Anatomy (1) (374221-4).

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

None

#### 7. Course Main Objective(s):

- Demonstrate routine radiographic procedures with standard terminologies and abbreviations of positioning and identify the basic and alternative radiographic examinations for the cranium, chest (upper airway, heart and lungs) and abdominal viscera, facial and dental radiography and mammography as well.
- State and project to identify the anatomical structures of cranium, chest (upper airway, heart and lungs) and abdominal viscera, facial and dental radiography and mammography.

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	7	100%
2	E-learning	-	-
3	Hybrid <ul style="list-style-type: none"> <li>• Traditional classroom</li> </ul>	-	-



No	Mode of Instruction	Contact Hours	Percentage
	• E-learning		
4	Distance learning	-	-

### 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	48
2.	Laboratory/Studio	32
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	-
<b>Total</b>		<b>80</b>

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

Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Recall the routine radiographic examinations and radiographic anatomy for the skull, chest, abdomen, dental radiography, and mammography.	<b>K1</b>	<b>Lectures</b>	Direct method: written exam (Quiz, mid and final exams)
1.2	Demonstrate the clinical indications, technical factors, standard terminologies, and abbreviations of positioning the basic, and special radiographic examinations for skull, chest, abdomen, dental radiography, and mammography.	<b>K2</b>	<b>Lectures</b>	Direct method: written exam (Quiz, mid and final exams)





Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
...				
<b>2.0</b>	<b>Skills</b>			
2.1	Apply routine and alternative radiographic examinations and how to read the medical requests properly	<b>S1</b>	<b>Lectures &amp; case study</b>	Indirect method survey
2.2	Choose the correct instructions to help in positioning the patient to obtain high quality images in-line with the clinical condition of the patient.	<b>S2</b>	<b>Lectures and practical session</b>	Direct Method exam and Assignment
2.3	illustrate the normal radiographic anatomical structures for the skull, chest, abdomen, dental radiography, and mammography	<b>S3</b>	<b>Lectures and practical session</b>	<b>Exams and practical reports</b>
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	Develop professionalism in working carefully and safely with conventional X-ray machines	<b>V1</b>	<b>Collaborative learning</b>	Indirect method survey

### C. Course Content

No	List of Topics	Contact Hours
1.	1. Chest Anatomy. 2. Radiographic Technique Considerations. Chapter 2 (pages 70-88) Textbook 1	5
2.	1. Chest radiography. 2. Practical demonstration on X-ray machine. Chapter 2 (pages 92- 103) Textbook 1	5
3.	1. Anatomy of the abdomen. 2. Positioning Considerations. Chapter 3 (pages 105- 109) Textbook 1	5
4.	1. Abdomen radiography. 2. Practical demonstration on X-ray machine. Chapter 3 (pages 110- 126) Textbook 1	5



5.	Cranium: a. Skull anatomy. b. Skull landmarks. Chapter 11 (pages 375- 382) Textbook 1	5
6.	Cranium: 1. Skull procedures (1) 2. Practical demonstration Chapter 15 (pages383- 390) Textbook 1	5
7.	Cranium: 1. Skull procedures (2) 2. Practical demonstration Chapter 11 (pages 383- 390) Textbook 1	5
8.	1. Facial bones radiography (1): a. Facial bone b. Practical demonstration . Chapter 11 (pages 391- 400) Textbook 1	5
9.	1. Facial bones radiography (2): a. Orbits. b. mandible Practical demonstration. Chapter 11 (pages 402- 414) Textbook 1	5
10.	1. Facial bones radiography (3): a. Zygoma b. PNS. 2. Practical demonstration. Chapter 11 (pages 315- 432) Textbook 1	5
11.	1. Dental radiography (1): dental anatomy and land marks Section 10 (pages280 -391) Textbook 2	5
12.	1. Dental radiography (1): a. Intraoral radiography Section 10 (pages292 -305) Textbook 2	5
13.	1. Dental radiography (2): a. Extraoral radiography. Section 10 (pages 306 -328) Textbook 2	5
14.	1. Mammography 1. Chapter 20 (pages 758 765) Textbook 1	5
15.	1. Mammography 2. Section 15 (pages 436 -363) Textbook 2	5
16.	<b>Revision</b>	5
<b>Total</b>		<b>80</b>





## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz	3 <sup>rd</sup>	10
2.	Mid-term exam	7 <sup>th</sup>	30
3.	Activity (Radiographic anatomy)	10 <sup>th</sup>	10
...	Practical exam	14 <sup>th</sup>	10
	Final theoretical exam	18 <sup>th</sup>	40

\*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	Bontrager's, Textbook for Radiographic Positioning & Related Anatomy John P. Lampignano, Leslie E. Kendrick, 9th Edition Elsevier 2018 ISBN: 978-0-323-39966-1
Supportive References	s 2. CLARK'S Positioning in Radiography WITHLEY Taylor & Francis group 13th Edition 2016 ISBN: 9780429167133
Electronic Materials	1. <a href="http://www.radiologyinfo.org/glossary">http://www.radiologyinfo.org/glossary</a> 2. <a href="http://www.radsciresearch.org">http://www.radsciresearch.org</a> 3. <a href="http://www.radiography.com/">http://www.radiography.com/</a> 4. <a href="http://www.jrcert.org">http://www.jrcert.org</a> 5. <a href="http://www.emory.edu/X-RAYS/Sprawl">http://www.emory.edu/X-RAYS/Sprawl</a>
Other Learning Materials	

### 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms, laboratories, demonstration rooms/labs
<b>Technology equipment</b> (projector, smart board, software)	Data show projectors
<b>Other equipment</b> (depending on the nature of the specialty)	Conventional / Digital X-ray machine

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching		





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

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

**Assessment Methods** (Direct, Indirect)

### G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	<b>DEPARTMENT COUNCIL</b>
<b>REFERENCE NO.</b>	<b>11<sup>TH</sup></b>
<b>DATE</b>	<b>24<sup>TH</sup> MAY 2022</b>





# Course Specification

— (Bachelor)

Course Title: **Ultrasound Physics and Instrumentation**

Course Code: **374312-3**

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: **4<sup>th</sup> September 2023**



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## A. General information about the course:

### 1. Course Identification

<b>1. Credit hours: (3)</b>					
<b>2. Course type</b>					
A.	<input type="checkbox"/> University	<input type="checkbox"/> College	<input checked="" type="checkbox"/> Department	<input type="checkbox"/> Track	<input type="checkbox"/> Others
B.	<input checked="" type="checkbox"/> Required		<input type="checkbox"/> Elective		
<b>3. Level/year at which this course is offered: (5<sup>th</sup> Level / 3<sup>rd</sup> year)</b>					
<b>4. Course general Description:</b>					
This course introduces principles of ultrasound physics and instrumentation, transducers construction and characteristics, sound beam formation, characteristics and interaction with matter, 2D image formation and display, Doppler principles, artifacts, biological effects and quality control of ultrasound machines.					
<b>5. Pre-requirements for this course (if any):</b>					
Diagnostic Radiography Instrumentation (374226-3).					
<b>6. Co -requirements for this course (if any):</b>					
None					
<b>7. Course Main Objective(s):</b>					
The course is designed to enable the student to outline and discuss the basics physics of medical ultrasound instrumentation including knobology, operation and basic principles quality control of ultrasound machines.					

### 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"> <li>• Traditional classroom</li> <li>• E-learning</li> </ul>	-	-
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)	
<b>Total</b>		<b>64</b>

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

Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Explain the basic principles of sound wave, interaction of sound with matter, pulsed and continuous doppler, beam intensity and potential bioeffects.	K1	Lectures Brainstorming	Direct method: Written exam Indirect method: Survey
1.2	Describe the various types and functions performed by the transducers and how to manipulate them for the best ultrasound image quality	K2	Lectures Brainstorming	Direct method: Written exam Indirect method: Survey
1.3	Identify acoustic artifacts on 2D and doppler images, and the processes involved in performing quality assurance tests on ultrasound system.	K3	Lectures Brainstorming	Direct method: Written exam Indirect method: Survey
<b>2.0</b>	<b>Skills</b>			
2.1	Operate properly all types of ultrasound machines and transducers for different ultrasound imaging examinations.	S5	Problem-based learning	Direct method Practical exam Indirect method Survey
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	Commit to the ethical and professional standards to ensure patient and equipment safety and proper usage of ultrasound machines.	V1	Collaborative Learning	Direct method Presentation Indirect method survey





### C. Course Content

No	List of Topics	Contact Hours
1.	<b>1. Introduction:</b> a. Units. b. Sound waves. Chapter; 1. Pages 1-3. (Textbook-1)	4
2.	<b>1. Principles of ultrasound physics (1):</b> a. Pulse and echo. Acoustic variable. Chapter; 1. Pages 4-13. (Textbook-1)	4
3.	<b>1. Principles of ultrasound physics (1):</b> a. Parameters of Sound. b. Pulse wave and duty factor Chapter; 1. Pages 4-13. (Textbook-1)	4
4.	<b>1. Principles of ultrasound physics (2)</b> a. Wave interference. b. Attenuation. Chapters; 1 Pages 14-23 (Textbook-1)	4
5.	<b>1. Principles of ultrasound physics (2)</b> a. Absorption. b. Reflection and refraction. Chapters; 1 Pages 14-23 (Textbook-1)	4
6.	<b>1. Principles of ultrasound physics (cont.)</b> <b>Acoustic interfaces and terminology.</b> Chapter; 2. Pages 32-34(Textbook-1)	4
7.	<b>1. Principles of ultrasound physics (cont.)</b> Sound beam and resolution. Chapter; 2. Pages 32-34. (Textbook-1)	4
8.	<b>1. Pulse echo imaging:</b> a. A-Mode. b. B-Mode. c. M-Mode. Chapter; 3. Pages 65-83. (Textbook-1)	4
9.	<b>1. Ultrasound instrumentations:</b> Image optimization (Knobology). Chapter; 2. Pages 37-57. (Textbook-1)	4





10.	<b>1. Ultrasound instrumentations:</b> Transducers. Chapter; 2. Pages 37-57. (Textbook-1)	4
11.	<b>Basic principles of ultrasound images artifacts.</b> Chapter; 3 Pages 83-93. (Textbook-1)	4
12.	<b>Principles of Doppler ultrasound I.</b> Chapter; 4. Pages 95-112. (Textbook-1)	4
13.	<b>Principles of Doppler ultrasound II.</b> Chapter; 4. Pages 95-112. (Textbook-1)	4
14.	<b>Biological effects of ultrasound.</b> Chapter; 6 PageS 155-161. (Textbook-1)	4
15.	<b>Quality control tests.</b> Chapter; 5 PageS 137-143. (Textbook-1)	4
16.	<b>General Revision</b>	4
<b>Total</b>		<b>64</b>

#### D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Presentation & Assignments	4 <sup>th</sup> & 10 <sup>th</sup>	20%
2.	Midterm written exam	8 <sup>th</sup>	30%
3.	Final practical exam	17 <sup>th</sup>	10%
4.	Final written Exam	18 <sup>th</sup>	40%

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

#### E. Learning Resources and Facilities

##### 1. References and Learning Resources

<b>Essential References</b>	<p>- Examination Review for Ultrasound: Sonography Principles and Instrumentation (Sonographic Principles and Instrumentation (Spi). Steven M. Penny, Traci B. Fox, Cathy H. Godwin, RDMS. 1st Edition. 2011 Chapters; 1-5. Pages;1-137. Lippincott Williams and Wilkins. ISBN-13: 978-1608311378.</p>
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	- Essentials of ultrasound physics James A.Zagzebski. 1st edition 1996. Chapters; 1-5. Pages; 1-220. Mosby. ISBN-13: 978-0815198529.
<b>Supportive References</b>	- Diagnostic Ultrasound: Principles and Instruments. Fredrick W. Kremkau, 7th Edition. 2010. Saunders. Chapters; 1-3. Pages;1-125.
<b>Electronic Materials</b>	1. <a href="http://www.radsciresearch.org">http://www.radsciresearch.org</a> 2. <a href="http://www.radiography.com/">http://www.radiography.com/</a>
<b>Other Learning Materials</b>	None

## 2. Required Facilities and equipment

Items	Resources
<b>Facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom. Ultrasound lab contains ultrasound scanners equipped with color doppler, printers, phantoms and acoustic gel for practical sessions.
<b>Technology equipment</b> (projector, smart board, software)	Data show. Phantoms for teaching purposes. LCD screen for practical sessions demonstration.
<b>Other equipment</b> (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	NA	NA

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

**Assessment Methods** (Direct, Indirect)





## G. Specification Approval

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





# Field Experience Specification

Course Title: **Clinical Practice in Radiography (1)**

Course Code: **374318-3**

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

Department: **Department of Radiological Sciences**

College: **College of Applied Medical Sciences**

Institution: **Taif University**

Field Experience Version Number: **3**

Last Revision Date: **4<sup>th</sup> September 2023**



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## A. Field Experience Details:

1. Credit hours: (3).

2. Level/year at which Field Experience is offered: (5<sup>th</sup> Level / 3rd Year).

3. Time allocated for Field Experience activities

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

Patient Care and Ethics in Radiology (374216-2).  
General Radiographic Techniques and Radiographic Anatomy (1) (374221-4).  
Diagnostic Radiography Instrumentation (374226-3).

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	--				
1.2	--				
2.0	Skills				
2.1	Communicate effectively with patient during the radiographic procedure (for upper and lower extremities, vertebral spine, and bony thorax) 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 technique with proper care according to the patient's condition.	S1	Problem solving Problem-based learning Practical Training	Continuous Assessment. Logbook assessment	Department teaching staff. Field Supervisor. Students.





Code	Learning Outcomes	Aligned PLO Code	Training Activities	Assessment Methods	Assessment Responsibility
				Practical Exam OSPE	
2.3	assess images accurately with high quality for upper and lower extremities, vertebral spine, and bony thorax.	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 X-ray machine properly.	S5	Problem-solving Problem-based learning Practical Training	Continuous Assessment. Logbook assessment Practical Exam OSPE	Department teaching staff. Field Supervisor. Students.
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>				
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.).

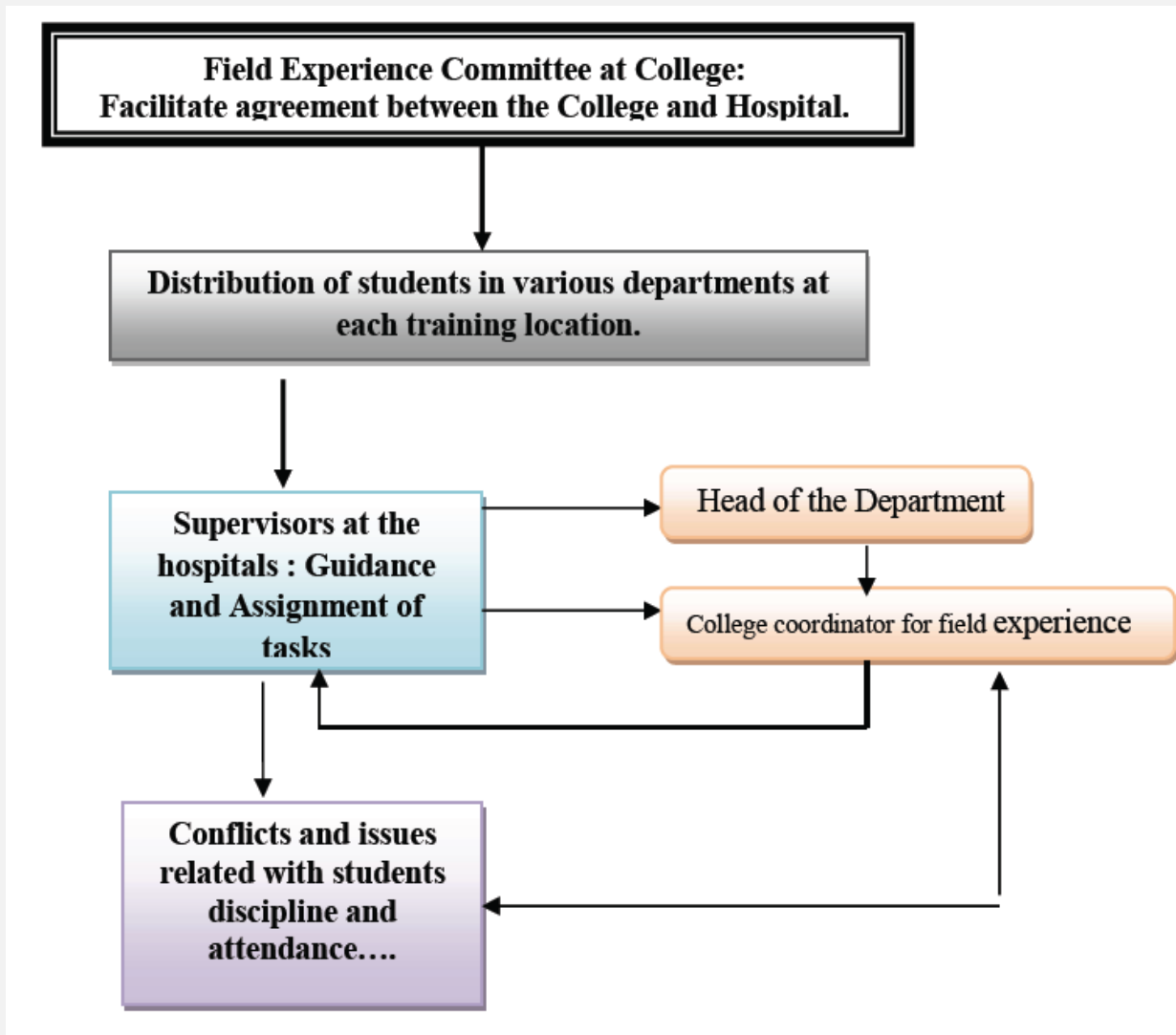


## C. Field Experience Administration

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



## 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 <sup>TH</sup>
Date	24 <sup>TH</sup> MAY 2022

