



Jordan University of Science and Technology

Faculty of Applied Medical Sciences

Department of Allied Medical Sciences

2016

Study Plan of Bachelor Degree in Radiologic Technology

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Vision:

The vision of the department is to lead, through academic and research excellence, regional and national health care delivery in the field of radiological sciences.

Mission:

Consistent with the mission of J.U.S.T. our mission is to be a premier in improving radiological sciences through graduating fully qualified graduates to fulfill the need in the community and the region.

Objectives:

1. To provide students with the required skills for producing high quality medical images.
2. To provide students with theoretical and practical knowledge on different medical imaging modalities, such as computed tomography, magnetic resonance imaging, and nuclear medicine.
3. To introduce the student to the ethics of the radiography career.

Job Opportunities: the Allied Medical Sciences Department prepares the graduate students in the radiologic technology program to work in hospitals and radiologic centers in the following fields:

1. General x-ray, fluoroscopy, computed tomography, magnetic resonance imaging, ultrasound, vascular catheterization, nuclear medicine technologist.
2. Radiation therapist.
3. Quality management and radiation protection technician.

Study Plan of Bachelor degree in Radiologic Technology

Numbering and coding system of courses of the study plan.

Course Coding

The following codes are used to designate courses:

Department		Level/year	Field	Sequence
A	B	x	y	z

The Department codes are as follows:

Code	Department	Code	Department
RA	Radiologic Technology	AS	Audiology and Speech Therapy
PT	Physical Therapy	PARA	Paramedic
OT	Occupational Therapy	ADS	Allied Dental Sciences
OPT	Optometry	LM	Medical Laboratory Sciences
TDEN	Dental Technology		

Course Numbering

- The Radiologic Technology courses are tabulated and numbered in such a manner to recognize each course regarding its subject area, year or level, and semester offered.
- Ex. RA xyz: The **RA** symbol in the course number denotes Radiologic Technology and (xyz) is a 3-digits number:

A. The first digit denotes the year level of the course according to student's study plan as follows:

Code	Level/year
1	First
2	Second
3	Third
4	Fourth

B. The second digit denotes the course field subject as follows:

Number	Specialization
0	Introductory and basic radiologic sciences
1	Principles of radiation physics
2	Conventional x-ray
3	Radiographic anatomy
4	Diagnostic radiology management
5	Advanced x-ray applications
6	Cross-sectional imaging
7	Nuclear medicine and radiation therapy
8	Clinical training

C. The third digit denotes sequence of semester during which the course is offered according to the study plan. In a way that odd numbers are given to the first and summer semesters while even numbers are given to second semesters. Example: RA 102 Introduction to Radiologic Technology means:

RA	1	0	2
Radiologic Technology	Level (first year)	Field (Introductory and basic radiologic sciences)	Sequence (second semester)

A Bachelor of Science (B.Sc.) degree in Radiologic Technology at JUST is awarded in accordance with the statute stated by JUST regulations for B.Sc. awarding issued by the Dean's Council based on the adjusted 1987 law for awarding scientific degrees and certifications at JUST after completing (137) credit hours successfully.

The study plan composed of the following:

Classification	Credit hours		
	Compulsory	Elective	TOTAL
University requirements	12	15	27
Faculty requirements	21	-	21
Department requirements	75	14	89
TOTAL	108	29	137

A. University Requirements (27 Credit Hours)

1. Compulsory University Courses (12 Credit Hours) as below:

Course No.	Course title	Credit hours	Theoretical	Practical
ARB 101	Arabic language	3	3	-
HSS 119	Entrepreneurship and innovation	2	2	-
LG 112(**)	English language 2	3	3	-
HSS 110	Social Responsibility	3	2	1
MS 100(*)	Military sciences	3	3	-
HSS 129	General Skills	2	2	LG 112

* The course is compulsory for Jordanian students only and is considered on a pass/ fail basis. Non-Jordanian students have to register for an alternative course selected from the list of university elective courses; grades for this course will be considered in the overall accumulative average of the student. In accordance with Higher Education Council's resolution 1561 dated 22.6.1998, students who have graduated from military institutions are exempted from this course. The exemption includes the following categories:

- Graduates of The Royal Military College, Mu'tah University – and similar international military institutions.
- Officers who have taken basic courses in military operations
- Students who have obtained a statement from the Directorate of Military Training verifying that the student is eligible for exemption.

** This course will be waived for students who have a TOEFL certificate with a score not less than 500.

NOTICE: Non-Arabic speaking students must register for the following Arabic language course:

Course Code	Course Name	Cr. Hr.	Theoretical	Practical	Prerequisite
ARB 101 A	Arabic language for None Arabic speakers	3	3	-	-

2. Elective courses: (15) Credit hours selected by the students from the following list:

	Course No.	Course title	Credit hours	Theoretical	Lab
Group One: Humanities					
1.	ARB 200	Appreciation of literary texts	3	3	-
2.	HSS 103	The Palestinian issue	3	3	-
3.	HSS 115	Islam and recent problems	3	3	-
4.	HSS 116	Economic system in Islam	3	3	-
5.	HSS 121	Principles of sociology	3	3	-
6.	HSS 126	Principles of psychology	3	3	-
7.	HSS 127	Educational technology	3	3	-

8.	HSS 131	Islamic civilization	3	3	-
9.	HSS 132	The history of the city of Jerusalem	3	3	-
10.	HSS 133	Civilization and recent cultures	3	3	-
11.	HSS 135	Islamic culture	3	3	-
12.	HSS 137	Human rights	3	3	-
13.	HSS 153	Islam and contemporary challenges	3	3	-
14.	HSS 161	Contemporary problems	3	3	-
15.	HSS 211	Sociology (in English)	3	3	-
16.	HSS 213	Individual and society	3	3	-
17.	HSS 221	Introduction to psychology (in English)	3	3	-
18.	HSS 231	History of science in Islam	3	3	-
19.	HSS 251	Music tasting	3	3	-
20.	LG 106	Basic German language	3	3	-
Group two: Scientific and Agricultural					
21.	ES 103	Environnement protection (for non environnent sciences students)	3	3	-
22.	ME 102	Introduction to renewable energy	3	3	-
23.	ME 211	Fundamentals of automobile engineering (for non-ME students)	3	3	-
24.	CHE 191	Introduction to the Nanotechnology	3	3	-
25.	NF 177	Food preservation (in English)	3	3	-
26.	AP 200	Farm animal products (for non-agriculture and veterinary students)	3	3	-

27.	PP 200	Home gardens (for non-plant production and soil and irrigation students)	3	3	-
28.	PP 201	Beekeeping (for non-plant production students)	3	3	-
29.	NR 200	Natural resources and human (for non-plant production and soil and irrigation students)	3	3	-
30.	NR 207	Plant earth problems & solutions (for non-agriculture students)	3	3	-
31.	NE 200	Principles in nuclear energy and its peaceful applications	3	3	-
Group Three: Health					
32.	NUR 100	Health promotion (for non-medicine, non-nursing, and non-midwifery students)	3	3	-
33.	ADS 100	Oral and dental health (for non-dentistry and non-dentistry sciences students)	3	3	-
34.	PH 104	Community health and nutrition (for non-medicine, non-nursing, and non-midwifery students)	3	3	-
35.	NUR 109	Family health (for non-medicine, non-nursing, and non-midwifery students)	3	3	-
36.	VM 211	Animal health (not for veterinary medical and agriculture students)	3	3	-
37.	VM 212	Pet animal care (not for veterinary medical students)	3	3	-
38.	VM 213	Animal behavior and welfare	3	3	-
39.	PT 100	Wellness and life styles (for non-physical and occupational therapy students)	3	3	-
40.	OT 100	Disability and the society(not allowed for rehabilitation science dep. students)	3	3	-

* This course does not count as a university elective course for forensic Science students.

** Students will be exempted from this course, in case a student passes the computer admission exam, or presents the International Computer Driving License (ICDL) certificate or the Cambridge International Diploma for IT skills.

B. Faculty Requirements: (21 credit hours) distributed as follows:

Course No.	Course title	Credit hours	Theoretical	Lab	Prerequisite or co-request
ADS 491	Administration and quality assurance in applied medical sciences	3	3	-	--
BT 103	General biology	3	3	-	--
BT107	General biology lab	1	-	1	BT 103 (or co)
CHEM 103	General chemistry	3	3	-	--
CHEM107	General chemistry lab	1	-	1	CEM 103 (or co)
PT 218	Gross anatomy and histology	3	2	1	BT 103, BT 107
MED 230A	Human physiology	3	3	-	BT 103
MED 230B	Human physiology lab	1	-	1	MED 230A (or co)
PH 311	Biostatistics	2	2	-	--
PARA 391	Ethics in applied medical careers	1	1	-	--
TOTAL		21	17	4	

C. Department requirements: (89 Credit Hours) distributed as follows:

1. Department required courses from the Faculty of Science and Arts (10 credit hours); distributed as follows:

Course No.	Course title	Credit hours	Theoretical	Lab	Prerequisite (or Co)
PHY 103	General physics	3	3	-	--
MATH 102a	Calculus (for Bio.Sci.Students)	3	3	-	--
CHEM 262	Biochemistry	3	3	-	CHEM 103, BT 103
CHEM 266	Biochemistry lab	1	-	1	CHEM 262 (or Co)
TOTAL		10	9	1	

2. Department required courses from the Faculty of Medicine (3 credit hours); distributed as follows

Course No.	Course title	Credit hours	Theoretical	Lab	Prerequisite (or Co)
LM 202	Pathology	3	3	-	PT 218, MED 230b
TOTAL		3	3	-	

4. Department required courses from the department of Allied Medical Sciences (62 credit hours); distributed as follows:

Course No.	Course title	Credit hours	Theoretical	Lab	Prerequisite	Co-requisite
RA 102	Introduction to radiologic technology	1	1	-	--	--
RA 211	Physics of radiology	3	3	-	PHY 103, RA 102	--
RA 212	Digital image processing and analysis	1	1	-	RA 211	--
RA 214	Digital image processing and analysis lab	1	-	1	--	RA 212
RA 216	Principles of diagnostic imaging 1	2	2	-	RA 211	--
RA 218	Principles of diagnostic imaging 1 lab	1	-	1	--	RA 216
RA 224	Peripheral osseous system radiography	2	2	-	PT 218	--
RA 226	Peripheral osseous system radiography lab	1	-	1	--	RA 224
RA 311	Principles of diagnostic imaging 2	2	2	-	RA 218	--
RA 313	Principles of diagnostic imaging 2 lab	1	-	1	--	RA 311
RA 327	Central osseous system radiography	2	2	-	RA 226	--
RA 329	Central osseous system radiography lab	1	-	1	--	RA 327
RA 334	Radiographic cross sectional anatomy	2	2	-	RA 335	--
RA 336	Radiographic cross sectional anatomy lab	1	-	1	--	RA 334

RA 343	Patient care in radiology department	2	2	-	RA 202	--
RA 345	Patient care in radiology department lab	1	-	1	--	RA 343
RA 350	Mammography	1	1	-	RA 313, RA 345	--
RA 352	Fluoroscopic imaging	2	2	-	RA 345	--
RA 354	Fluoroscopic imaging lab	1	-	1	--	RA 352
RA 362	Ultrasound	3	3	-	RA 313	--
RA 383	Clinical training1	3	-	3	RA 226	--
RA 386	Clinical training 2	3	-	3	RA 383	--
RA 413	Quality management in medical imaging	2	2	-	RA 313	--
RA 415	Quality management in medical imaging lab	1	-	1	--	RA 413
RA 416	Scientific research methods	1	1	-	PH 311	--
RA 444	Evidence-based Imaging	3	3	-	RA 465, RA 469	--
RA 463	Magnetic resonance imaging	2	2	-	RA 336	--
RA 465	Magnetic resonance imaging lab	1	-	1	--	RA 463
RA 467	Computed tomography	2	2	-	RA 336	--
RA 469	Computed tomography lab	1	-	1	--	RA 467

RA 475	Nuclear medicine and radiation therapy	3	3	-	RA 211, RA 336	--
RA 487	Clinical training 3	3	-	3	RA 386	--
RA 488	Clinical training 4	6	-	6	RA 487	--
TOTAL		62	36	26		

5. Department elective courses from the department of Allied Medical Sciences (14 credit hours); distributed as follows:

Course No.	Course title	Credit hours	Theoretical	Lab	Prerequisite	Co-requisite
RA 202	Introduction to radiation biology and radiation protection	3	3	-	RA 102	--
RA 333	Radiographic surface anatomy	2	2	-	PT 218	--
RA 335	Radiographic surface anatomy lab	1	-	1	--	RA 333
RA 346	Radiologic pathology	3	3	-	LM 202	--
RA 356	Dental radiography	1	1	-	RA 329	--
RA 358	Dental radiography lab	1	-	1	--	RA 356
RA 453	Vascular imaging	2	2	-	RA 354	--
RA 455	Vascular imaging lab	1	-	1	--	RA 453
RA 489	Special topics in Magnetic Resonance Imaging	3	2	1	--	--

RA 490	Special topics in Computed Tomography	3	2	1	--	--
RA491	Special topics in Radiographic Contrast Media	2	2	-	--	--
RA 492	Radiotherapy	2	2	-	--	--
RA 493	Radiotherapy lab	1	-	1	--	--
RA 494	Computer in Medical Imaging	2	2	-	--	--
TOTAL		27	21	6		

Study Plan

FIRST YEAR													
First semester						Second semester							
Course No.	Course name	Total credits	Weekly hours		Prerequisite	Corequisite	Course No.	Course name	Total credits	Weekly hours		Prerequisite	Corequisite
			Lecture	Lab						Lecture	Lab		
HSS 110	Social Responsibility	3	2	1	--	--	PT 218	Gross anatomy and histology	3	2	2	BT 103 BT 107	--
BT 103	General biology	3	3	-	--	--	PT 230A	Human physiology	3	3	-	BT 103	--
BT 107	General biology practical	1	-	2	BT 103 (or Co)	--	MED 230B	Human physiology lab	1	-	2	MED 230A (or Co)	--
CHEM 103	General chemistry	3	3	-	--	--	HSS 119	Entrepreneurship and innovation	2	2	-	-	--
CHEM 107	General chemistry lab	1	-	2	CHEM 103 (or Co)	--	MS 100	Military sciences	3	3	-	--	--
PHY 103	General physics	3	3	-	--	--	MATH 102a	Calculus (for Bio.Sci.Students)	3	3	-	--	--
LG 112	English language 2	3	3	-	Passing LG 099 or passing English Language Placement Test with a grade > 50%	--	RA 102	Introduction to radiologic technology	1	1	-	--	--
TOTAL		17	15	4			TOTAL		15	14	3		

SECOND YEAR													
First semester							Second semester						
Course No.	Course name	Total credits	Weekly hours		Prerequisite	Corequisite	Course No.	Course name	Total credits	Weekly hours		Prerequisite	Co-requisite
			Lecture	Lab						Lecture	Lab		
CHEM 262	Biochemistry	3	3	-	CHEM 103, BT 103	--	LM 202	Pathology	3	3	-	PT 218, MED 230b	--
CHEM 266	Biochemistry (Lab)	1	-	3	CHEM 262 (or Co)	--	RA 224	Peripheral osseous system radiography	2	2	-	RA 102	--
HSS 129	General skills	2	2	-	LG 112	--	RA 212	Digital image processing and analysis	1	1	-	RA 211	--
PH 311	Biostatistics	2	2	-	--	--	RA 214	Digital image processing and analysis lab	1	-	2	--	RA 212
RA 211	Physics of radiology	3	3	-	PHY 103, RA 102	--	RA 216	Principles of diagnostic imaging 1	2	2	-	RA 211	--
	University elective	3	3	-	--	--	RA 218	Principles of diagnostic imaging 1 lab	1	-	2	--	RA 216
ARB 101	Arabic language	3	3	-	--	--	RA 226	Peripheral osseous system radiography lab	1	-	2	--	RA 224
TOTAL		17	16	3			TOTAL		14	11	6		

THIRD YEAR													
First semester							Second semester						
Course No.	Course name	Total credits	Weekly hours		Prerequisite	Co-requisite	Course No.	Course name	Total credits	Weekly hours		Prerequisite	Co-requisite
			Lecture	Lab						Lecture	Lab		
RA 311	Principles of diagnostic imaging 2	2	2	-	RA 218	--	RA 334	Radiographic cross sectional anatomy	2	2	-	RA 335	--
RA 313	Principles of diagnostic imaging 2 lab	1	-	2	--	RA 311	RA 336	Radiographic cross sectional anatomy lab	1	-	2	--	RA 334
RA 327	Central osseous system radiography	2	2	-	RA 226	--	--	Department elective course	3	3	-	--	--
RA 329	Central osseous system radiography lab	1	-	2	--	RA 327	RA 350	Mammography	1	1	-	RA 313, RA 345	--
--	Department elective course	2	2	-	--	--	RA 352	Fluoroscopic imaging	2	2	-	RA 345	--
--	Department elective course	1	-	2	--	RA 333	RA 354	Fluoroscopic imaging lab	1	-	2	--	RA 352
RA 343	Patient care in radiology department	2	2	-	RA 202	--	--	Department elective course	1	1	-	--	--
RA 345	Patient care in radiology department lab	1	-	2	--	RA 343	--	Department elective course	1	-	2	--	RA 356
RA 383	Clinical training 1	3	-	6	RA 226	--	RA 362	Ultrasound	3	3	-	RA 313	--
LM 491	Scientific research methods	1	1	-	PH 311	LM 491							
PARA 391	Ethics in applied medical careers	1	1	-	--	--	RA 386	Clinical training 2	3	-	6	RA 383	--
TOTAL		17	10	14			TOTAL		18	12	12		

FOYRTH YEAR													
First semester							Second semester						
Course No.	Course name	Total credits	Weekly hours		Prerequisite	Co-requisite	Course No.	Course name	Total credits	Weekly hours		Prerequisite	Co-requisite
			Lecture	Lab						Lecture	Lab		
RA 411	Quality management in medical imaging	2	2	-	RA 313	--	ADS 491	Administration and quality assurance in applied medical sciences	3	3	-	--	--
RA 415	Quality management in medical imaging lab	1	-	2	--	RA 413	RA 444	Evidence-based imaging	3	3	-	RA 465, RA 469	--
RA 463	Magnetic resonance imaging	2	2	-	RA 336	--	RA 488	Clinical training 4	6	-	12	RA 487	--
RA 465	Magnetic resonance imaging lab	1	-	2	--	RA 463	LM 493	Research project	2	-	2	LM 491	LM 493
RA 467	Computed tomography	2	2	-	RA 336	--		University elective	3	3	-	--	--
RA 469	Computed tomography lab	1	-	2	--	RA 467							
RA 475	Nuclear medicine and radiation therapy	3	3	-	RA 211, RA 336	--							
RA 487	Clinical training 3	3	-	6	RA 386	--							
--	Department elective course	2	2	-	--	--							
--	Department elective course	1	-	2	--	RA 453							
TOTAL		18	12	12			TOTAL		17	9	14		

Course Description

RA 102 Introduction to radiologic technology (1 C.H) (Prerequisite: NA)

Introduces the student to the profession of radiologic technology. It includes the profession's policies and regulations and provides the student with the relevant medical terminology. In addition, the history of ionizing radiation and its interactions with the matter are covered briefly.

RA 202 Introduction to radiation biology and radiation protection (3 C.H) (Prerequisite: RA 102)

Comprehensive study of radiobiology and radiation protection measures. It covers biological tissue radio-sensitivity, short and long term radiation effects, responsive curves, how to calculate the doses and their effect on the body, and lethal doses. In addition, radiation detection and monitoring devices are described.

RA 211 Physics of radiology (3 C.H) (Prerequisite: PHY 103, RA 102)

Study of the physical principles of ionizing radiation including structure of atoms, electricity, magnetism, motors, transformers, electromagnetism, x-ray production, interactions of x-ray with matter, x-ray circuitries and digital signal processing.

RA 212 Digital image processing and analysis (1 C.H) (Prerequisite: RA 211)

An introduction onto using image processing and analysis programs dedicated to improve the quality of the image for diagnostic purposes, and how to adjust the image properties.

RA 214 Digital image processing and analysis lab (1 C.H) (Co-requisite: RA 212)

Applying the theoretical knowledge obtained in RA 214 in lab-based practice sessions to allow the students to grasp the skills of digital image manipulation.

RA 216 Principles of diagnostic imaging 1 (2 C.H) (Prerequisite: RA 211)

Summary of interactions that produce radiation, the properties of electromagnetic waves, installation of films and their properties and types, films emulsion, quality image (image details, contrast, sharpness, ...), how to prepare technique chart in the radiology department to adjust the imaging protocols.

RA 218 Principles of diagnostic imaging 1 lab (1 C.H) (Co-requisite: RA 216)

Identify sizes and types of the x-ray films, cassettes sizes and screens, processing and imaging device in the laboratory.

RA 224 Peripheral osseous system radiography (2 C.H) (Prerequisite: PT 218)

Patient positioning and imaging of upper and lower extremities, abdomen and pelvis, image signs of excellence and exposure factors of each part in the body.

RA 226 Peripheral osseous system radiography lab (1 C.H) (Co-requisite: RA 224)

Using simulated human body doll to practice patient positioning of the upper limbs and lower limbs as a preclinical training before hospitals.

RA 311 Principles of diagnostic imaging 2 (2 C.H) (Prerequisite: RA 218)

Completes the principles of diagnostic radiology 1, includes principles in tomography imaging and fluoroscopy, old imaging principles and modern methods, image magnification principles.

RA 313 Principles of diagnostic imaging 2 lab (1 C.H) (Co-requisite: RA 311)

Exposure factors changing that affect the quality of the images through the control panel in addition to the application of digital radiology equipment.

RA 327 Central osseous system radiography (2 C.H) (Prerequisite: RA 226)

Patient positioning and imaging of skull, vertebral column and facial bones, image signs of excellence and exposure factors of each part in the body.

RA 329 Central osseous system radiography lab (1 C.H) (Co-requisite: RA 327)

Using simulated human body doll to practice patient positioning of the of skull, vertebral column and facial bones as a preclinical training before hospitals.

RA 333 Radiographic surface anatomy (2 C.H) (Prerequisite: PT 218)

Identify the anatomical parts in the radiographic images, and knowledge of the main body landmarks, combine body landmarks with the patient positioning according to the x-ray passage through the body parts.

RA 334 Radiographic cross sectional anatomy (2 C.H) (Prerequisite: RA 335)

A Cross section appearance of various body parts, as they projected by different modalities such as CT and MRI scanning.

RA 335 Radiographic surface anatomy lab (1 C.H) (Co-requisite: RA 333)

Identify anatomical parts through x-ray images, bony and soft tissue land marks for patient positioning.

RA 336 Radiographic cross sectional anatomy lab (1 C.H) (Co-requisite: RA 334)

Identify anatomical cross sectional parts through CT and MRI images for the whole body.

RA 343 Patient care in radiology department (2 C.H) (Prerequisite: RA 202)

Procedures and techniques used in the care of the diagnostic imaging patient, different routes and methods of drug/contrast administration, identify drug categories, accurate procedure for venipuncture and categories of drug reactions and drugs indications and contraindications.

RA 346 Radiologic pathology (3 C.H) (Prerequisite: LM 202)

The appearance of various diseases in the x-ray, MRI and CT images and the impact of imaging methodology on the pathological appearance.

RA 345 Patient care in radiology department lab (1 C.H) (Co-requisite: RA 343)

Application of the skills and methods of patient care, identify means of drugs injection into the body.

RA 350 Mammography (1 C.H) (Prerequisite: RA 313, RA 345)

Mammography imaging device properties and the principles of the imaging procedure, breast anatomy, justifications of patient imaging.

RA 352 Fluoroscopic imaging (2 C.H) (Prerequisite: RA 345)

Means of contrast studies imaging, digestive and urinary tract, contrast properties of the material, indications and contraindications to use, side effects, and instructions to the patients before and after leaving the radiology department.

RA 354 Fluoroscopic imaging lab (1 C.H) (Co-requisite: RA 352)

Contrast imaging methods and postures for the digestive system, urinary tract and other additional views and displaying x-rays to know the reasons of imaging through the cases.

RA 356 Dental radiography (1 C.H) (Prerequisite: RA 329)

Identify the imaging device and films used for dental imaging, risks of dental rays, the methods used to reduce exposure to radiation when imaging teeth, and quality assurance program in dental radiology.

RA 358 Dental radiography lab (1 C.H) (Co-requisite: RA 356)

Training students on oral and dental imaging and the ability to assess and determine the quality of the images, highlight some oral and dental diseases and radiological appearances.

RA 362 Ultrasound (3 C.H) (Prerequisite: RA 313)

Ultrasound physics, ultrasonic wave imaging, the device definition and preparation of the patient and the instructions for the examination, the methods and examination positions, knowledge of the diseases that prefers the use of ultrasound and learn about the latest technologies in this field.

RA 383 Clinical practice 1 (3 C.H) (Prerequisite: RA 226)

Introduces students to the radiology department, equipment and instruments, practical training in hospitals for the peripheral osseous system under the supervision of technicians.

RA 386 Clinical practice 2 (3 C.H) (Prerequisite: RA 383)

Practical training in hospitals for the central osseous system and others from the previous course under the supervision of technicians.

RA 413 Quality management in medical imaging (2 C.H) (Prerequisite: RA 313)

Covers all the technical and administrative processes to ensure that radiographic equipment performs according to the manufacturer standards, quality control of film processors, fluoroscopic, CT scanning and repeat film analysis.

RA 415 Quality management in medical imaging lab (1 C.H) (Co-requisite: RA 413)

Practical applications for various quality control procedures.

RA 416 Scientific research methods (1C.H) (Prerequisite: PH 311)

Students will learn modern research methods and undergo practical or theoretical research and discuss it together which will develop their skills. Topics are mainly in an experimental basis. The group is required to review articles, books or any resources relevant to their topic, in addition to the practical work that they will be asked to do. At the end of the semester, they will submit a report about the topic selected and present their work in an assigned date.

RA 444 Evidence-based imaging (3 C.H) (Prerequisite: RA 465, RA 469)

Identify the methodological framework to understand the best options for imaging and patient care and understanding of the key points that support clinical applications include patient selection, imaging strategies, test performance, cost, and applicability.

RA 453 Vascular imaging (2 C.H) (Prerequisite: RA 354)

Angiography, imaging of the lymphatic system, justifications of the blood vessels and the lymphatic system imaging, the instructions given to the patient before and after leaving the radiology department.

RA 455 Vascular imaging lab (1 C.H) (Co-requisite: RA 453)

Identify the equipment and tools used in the imaging and treatment of blood vessels, display x-rays to know the reasons of imaging through the cases.

RA 463 Magnetic resonance imaging (2 C.H) (Prerequisite: RA 336)

Magnetic resonance physics, the principles of electricity and magnets, magnetic resonance image configuration, protocols used in magnetic resonance imaging, means of safety in the magnetic resonance, and comparison between the advantages and disadvantages of MRI with other devices.

RA 465 Magnetic resonance imaging lab (1 C.H) (Co-requisite: RA 463)

The system and protocols used in magnetic resonance imaging, display images to know the reasons of imaging through the cases.

RA 467 Computed tomography (2 C.H) (Prerequisite: RA 336)

The physics and the imaging equipment, history of tomography, mathematical calculations upon which the operation of the device, imaging protocols, patient preparations for examinations and advantages and limitations in comparison to other modalities.

RA 469 Computed tomography lab (1 C.H) (Co-requisite: RA 467)

The system and protocols used in computed tomography imaging, display images to know the reasons of imaging through the cases.

RA 475 Nuclear medicine and radiation therapy (3 C.H) (Prerequisite: RA 211, RA 336)

Physics of radioactivity and radiation decay, detection methods for radioactivity, the use of radioactive materials in the detection of biological problems in the body, patient dose and care, methods and properties of radiation therapy, positive and negative effects of the treatment of various types of radiation, and the principles and components of physical equipment used in this field.

RA 487 Clinical practice 3 (3 C.H) (Prerequisite: RA 386)

Practical training in hospitals for fluoroscopic and contrast imaging studies and others from the previous course under the supervision of technicians.

RA 488 Clinical practice 4 (6 C.H) (Prerequisite: RA 487)

Practical training in hospitals for the MRI, CT, nuclear medicine, ultrasound and others under the supervision of technicians.

RA 489 Special topics in Magnetic Resonance Imaging (3 C.H)

This subject introduces the imaging modality of magnetic resonance imaging (MRI). It covers the MRI physics and instrumentation, detailed examination of pulse sequences, scan techniques and protocols utilised in clinical practice. It also considers quality assurance, magnetic and RF safety issues and departmental planning.

RA 490 Special topics in Computed Tomography (3 C.H)

This subject introduces the physics, instrumentation, techniques, protocols and clinical applications utilised in computed tomography in clinical practice. Instrumentation areas will include an introducing the principles of CT, as well as any relevant regulations, quality assurance, department planning and radiation/hazard protection involved in the equipment's operation. The study of clinical applications consists of an emphasis on the clinical indications and the procedural techniques of CT examinations, together with the pathology demonstrated and overall patient management.

RA 491 Special topics in Radiographic Contrast Media (2 C.H)

Students are further acquainted with procedures in radiography involving the use of contrast media. Detailed information is provided on the equipment and media used, and on the reactions and contradictions to these media. Critiques of radiographic films are conducted in the classroom/laboratory.

RA 492 Radiotherapy (2 C.H)

This course provides the student with instruction in comprehensive development of the concepts and practical skills of radiation therapy treatment and planning relevant to advanced and emerging radiation therapy procedures. Students will apply these knowledge and skills in practical situations and critically consider relevant aspects of patient care and professional practice.

RA 493 Radiotherapy lab (1 C.H)

Practical skills of radiation therapy treatment and planning relevant to advanced and emerging radiation therapy procedures

RA 494 Computer in Medical Imaging (2 C.H)

This course will introduce the student to fundamental principles of computer technology, and its role in medical imaging. Computerized tomography and MRI will be discussed. Equipment and its application will be investigated. This course is designed to introduce computers with medical applications as it relates to the radiology department.