

Ministry of Education  
King Saud University (KSU)  
Deanship of Graduate Studies



College of Applied Medical  
Sciences  
Department of Radiological  
Sciences

# **Master of Sciences in Radiological Sciences**

## **(Thesis Option / Non-thesis Option)**

- **Introduction:**

College of Applied Medical Sciences is one of the health colleges at King Saud University, was established in 1396 AH corresponding to 1977G. The College is the first applied medical science college established in the Kingdom and aims to prepare leading health professionals with high professional and research skills through providing distinguished academic programs according to quality standards.

The Department of Radiological Sciences was established in the College of Applied Medical Sciences in the year 1400AH corresponding to 1990 G. The undergraduate program in Radiological Sciences is the first program in the Middle East. Since its establishment, the program has graduated more than 1500 students. The program received international accreditation from the German Accreditation Commission for Health Sciences (AHPGS) in the year 2011.

Radiological science covers multiple techniques for the diagnosis of diseases affecting the human body, including diagnostic radiography, Nuclear Medicine(NM), ultrasound (US), Computerized Tomography (CT), and Magnetic Resonance Imaging (MRI), where technologists perform radiographic procedures, apply radiation protection principles, evaluates images quality with practicing profession and patient care. Technologists who graduated from the program can find jobs in hospitals, clinics, and industrial companies.

The Department of Radiological Sciences at the College of Applied Medical Sciences has the availability of qualified teaching staff and research laboratories that support the conduct of scientific research in various fields of specialization. Over the past five years, the department research groups have published more than 120 scientific papers in international scientific peer reviewed journals in the following fields:

- ❖ Nuclear medicine and Molecular Imaging
- ❖ Magnetic Resonance Imaging Technology
- ❖ Medical Ultrasonography
- ❖ Medical Radiation Protection

On the other hand, the health care sector in the Kingdom of Saudi Arabia, including the public and private sectors, reveals rapid growth in the number and type of health facilities, in particular the qualitative and quantitative developments in radiological sciences and medical imaging over the last decade. This program has been proposed to meet this need and meet the needs of the radiological sciences and medical imaging sector in Saudi Arabia.

- **Degree's Name:**

- ❖ Nuclear medicine and Molecular Imaging
- ❖ Magnetic Resonance Imaging Technology
- ❖ Medical Ultrasonography

❖ Medical Radiation Protection

- **Program's Language:**

❖ English language

- **Program's Vision**

Regional leadership with International Reputation in Radiologic Sciences and Medical Imaging

- **Program's Mission**

To contribute in the advancement of Health care for the community through qualifying competitive professionals in Radiologic Sciences and Medical Imaging, to provide an environment that encourages learning and creativity, and to produce researches that contribute in building the knowledge community.

- **Program's Objectives**

The objectives for MSc program in radiological sciences are as follows:

1. To provide in depth advanced knowledge and skills of radiological sciences in the field of subspecialty: nuclear Medicine and Molecular Imaging, MRI Technique, Diagnostic Medical US or Medical Radiation Protection.
2. To prepare the highly qualified graduates in the field of radiological sciences to contribute in fulfilling the new demands of radiological specialties in health sectors and academic radiological sciences departments in KSA.
3. To develop a generation of distinguished researchers in the field of radiological sciences.

- **Program's Outcomes**

**A- Knowledge and Comprehension:**

1. Acquiring advanced knowledge related to the subspecialty of radiological sciences in evidence-based practice.
2. Deepening knowledge that related to the subspecialty of radiological sciences.
3. Understanding the ethics of scientific research related to subspecialty of radiological sciences.

**B- Mental Skills:**

1. Strengthen fundamental skills in radiological sciences specialties for excellence in medical imaging technology specialists.
2. Optimal design of radiological sciences subspecialties protocols.
3. Identify, analyses, and solve problems related to the subspecialty of radiological sciences.

**C- Professional and Practical Skills:**

1. Effective performance of radiological sciences protocols related to the subspecialty.

2. Using up-to-date technologies and advanced experiences in radiological sciences subspecialty.
3. Professional management, teamwork and responsibility in the field of radiological sciences subspecialties
4. Applying the ethics of scientific research in the field of radiological sciences
5. Skills of effective teaching and training for students in the subspecialties of radiological sciences

**D- General Skills:**

1. Realize and expand new knowledge in radiological sciences specialties that contribute to improve the quality of health care.
2. Improve the leadership and education skills in the field of radiological sciences.
3. Effective communication and team-work with highly qualified medical staff

● **Program Beneficiaries:**

- ❖ Radiological Sciences Graduates
- ❖ Radiological Specialists in hospitals, medical institutions and research centers

● **Employment Opportunities Available:**

- ❖ Governmental and private Hospitals
- ❖ Public and Private Universities
- ❖ Health Research centers
- ❖ Health Institutions and Organizations

● **Requirements for obtaining the Degree:**

❖ **Thesis Option**

- Passing (27) study units of master's courses
- Successful completion of master's dissertation

❖ **Non-thesis option**

- Passing (32) study units of Master's courses including the research project

● **Program's Tracks:**

1. Nuclear medicine and Molecular Imaging
2. Magnetic Resonance Imaging Technology
3. Medical Ultrasonography
4. Medical Radiation Protection

● **Program General Structure:**

❖ **Thesis Option**

- Number of required units is (27) units in addition to (6) thesis units as follows:

Type of Courses	No. of Courses	No. of Units Required
<b>Core courses</b>	(9) courses for each Track	(24) Study unit
<b>Elective courses</b>	(1) for each Track	(3) Study unit
<b>Thesis</b>	(1)	(6) Study unit
<b>Total</b>	<b>(11)</b>	<b>(27) Study unit + (6) study units for thesis</b>

❖ **Non-thesis Option**

- Number of units required is (32) including the project as follows:

Type of Courses	No. of Courses	No. of Units Required
<b>Core courses</b>	(10) courses for each Track	(25) Study unit
<b>Elective courses</b>	(1) for each Track	(3) Study unit
<b>Research project</b>	(2)	(4) Study unit
Total	<b>(13)</b>	<b>(32) Study unit</b>

- **Study Plan for Program Tracks:**

- ❖ **Nuclear medicine and Molecular Imaging Track**

- A/ Thesis Option**

- **First Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	511 RAD	Pathophysiology	3(2+2)	
2	513 RAD	Radiation Detection and Measurements	3(2+2)	
3	515 RAD	Physical Principles of Non-Ionizing Radiation	3(2+2)	
<b>Total</b>			<b>(9) Units</b>	

- **Second Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	517 RAD	Medical Image Processing	3(2+2)	
2	519 RAD	Quality Assurance in Radiology	2(1+2)	
3	531 RAD	Radiopharmaceutical Sciences	3(2+2)	
<b>Total</b>			<b>(8) Units</b>	

- **Third Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	533 RAD	Radiation safety and dosimetry in NM	3(2+2)	513 RAD
2	535 RAD	Radionuclide therapy	3(2+2)	531 RAD
3	596 RAD	Thesis Proposal Preparation	One unit	(13) units
4	---- RAD	Elective Course (1)	3(2+2)	
<b>Total</b>			<b>(10) Units</b>	

- **Fourth Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	600 RAD	Thesis	(6) Units	596 RAD
<b>Total</b>			<b>(6) Units</b>	

- **List of elective courses (student must select single course from the following):**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	537 RAD	Advanced Clinical Nuclear Medicine	3(2+2)	
2	539 RAD	Preclinical NM Techniques	3(2+2)	

## B/ Non-Thesis Option

### ○ First Level:

#	Course Code	Name	No. of Study Units	Pre-requisite
1	511 RAD	Pathophysiology	3(2+2)	
2	513 RAD	Radiation Detection and Measurements	3(2+2)	
3	515 RAD	Physical Principles of Non-Ionizing Radiation	3(2+2)	
<b>Total</b>			<b>(9) Units</b>	

### ○ Second Level:

#	Course Code	Name	No. of Study Units	Pre-requisite
1	517 RAD	Medical Image Processing	3(2+2)	
2	519 RAD	Quality Assurance in Radiology	2(1+2)	
3	531 RAD	Radiopharmaceutical Sciences	3(2+2)	
<b>Total</b>			<b>(8) Units</b>	

### ○ Third Level:

#	Course Code	Name	No. of Study Units	Pre-requisite
1	533 RAD	Radiation safety and dosimetry in NM	3(2+2)	513 RAD
2	534 RAD	Seminar in Nuclear Medicine (1)	1(1+0)	
3	535 RAD	Radionuclide therapy	3(2+2)	531 RAD
4	598 RAD	Research Project (1)	2(2+0)	
<b>Total</b>			<b>(9) Units</b>	

### ○ Fourth Level:

#	Course Code	Name	No. of Study Units	Pre-requisite
1	---- RAD	Elective Course (1)	3(2+2)	
2	536 RAD	Seminar in Nuclear Medicine (2)	1(1+0)	534 RAD
3	599 RAD	Research Project (2)	2(2+0)	598 RAD
<b>Total</b>			<b>(6) Units</b>	

### ○ List of elective courses (student must select single course from the following):

#	Course Code	Name	No. of Study Units	Pre-requisite
1	537 RAD	Advanced Clinical Nuclear Medicine	3(2+2)	
2	539 RAD	Preclinical NM Techniques	3(2+2)	

**❖ Study Plan for Magnetic Resonance Imaging Technology Track  
A/ Thesis Option**

○ **First Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	511 RAD	Pathophysiology	3(2+2)	
2	513 RAD	Radiation Detection and Measurements	3(2+2)	
3	515 RAD	Physical Principles of Non-Ionizing Radiation	3(2+2)	
<b>Total</b>			<b>(9) Units</b>	

○ **Second Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	517 RAD	Medical Image Processing	3(2+2)	
2	519 RAD	Quality Assurance in Radiology	2(1+2)	
3	541 RAD	MRI Physics and instrumentation	3(2+2)	
<b>Total</b>			<b>(8) Units</b>	

○ **Third Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	543 RAD	Fundamental MRI procedures	3(2+2)	541 RAD
2	545 RAD	Body and Vascular MRI procedures	3(2+2)	541 RAD
3	596 RAD	Thesis Proposal Preparation	One unit	(13) units
4	---- RAD	Elective Course (1)	3(2+2)	
<b>Total</b>			<b>(10) Units</b>	

○ **Fourth Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	600 RAD	Thesis	(6) Units	596 RAD
<b>Total</b>			<b>(6) Units</b>	

○ **List of elective courses (student must select single course from the following):**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	547 RAD	Advanced Neurological MRI procedures	3(2+2)	
2	549 RAD	Advanced cardiovascular MRI procedures	3(2+2)	



## B/ Non-Thesis Option

○ **First Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	511 RAD	Pathophysiology	3(2+2)	
2	513 RAD	Radiation Detection and Measurements	3(2+2)	
3	515 RAD	Physical Principles of Non-Ionizing Radiation	3(2+2)	
<b>Total</b>			<b>(9) Units</b>	

○ **Second Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	517 RAD	Medical Image Processing	3(2+2)	
2	519 RAD	Quality Assurance in Radiology	2(1+2)	
3	541 RAD	MRI Physics and instrumentation	3(2+2)	
<b>Total</b>			<b>(8) Units</b>	

○ **Third Level**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	543 RAD	Fundamental MRI procedures	3(2+2)	541 RAD
2	544 RAD	Seminar in MRI (1)	1(1+0)	
3	545 RAD	Body and Vascular MRI procedures	3(2+2)	541 RAD
4	598 RAD	Research Project (1)	2(2+0)	
<b>Total</b>			<b>(9) Units</b>	

○ **Fourth Level**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	---- RAD	Elective Course (1)	3(2+2)	
2	546 RAD	Seminar in MRI (2)	1(1+0)	544 RAD
3	599 RAD	Research Project (2)	2(2+0)	598 RAD
<b>Total</b>			<b>(6) Units</b>	

○ **elective courses (student must select single course from the following):**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	547 RAD	Advanced Neurological MRI procedures	3(2+2)	
2	549 RAD	Advanced cardiovascular MRI procedures	3(2+2)	

❖ **Study Plan for Medical Ultrasonography Track**

**A/ Thesis Option**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	511 RAD	Pathophysiology	3(2+2)	
2	513 RAD	Radiation Detection and Measurements	3(2+2)	
3	515 RAD	Physical Principles of Non-Ionizing Radiation	3(2+2)	
<b>Total</b>			<b>(9) Units</b>	

○ **Second Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	517 RAD	Medical Image Processing	3(2+2)	
2	519 RAD	Quality Assurance in Radiology	2(1+2)	
3	551 RAD	Ultrasound Physics and instrumentation	3(2+2)	
<b>Total</b>			<b>(8) Units</b>	

○ **Third Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	553 RAD	Abdominal Sonography	3(2+2)	551 RAD
2	555 RAD	Superficial Parts Sonography	3(2+2)	551 RAD
3	596 RAD	Thesis Proposal Preparation	One unit	(13) units
4	---- RAD	Elective Course (1)	3(2+2)	
<b>Total</b>			<b>(10) Units</b>	

○ **Fourth Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	600 RAD	Thesis	(6) Units	596 RAD
<b>Total</b>			<b>(6) Units</b>	

○ **List of elective courses (student must select single course from the following):**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	557 RAD	Vascular Sonography	3(2+2)	
2	559 RAD	Obs/Gyn Sonography	3(2+2)	

## B/ Non-Thesis Option

### ○ First Level:

#	Course Code	Name	No. of Study Units	Pre-requisite
1	511 RAD	Pathophysiology	3(2+2)	
2	513 RAD	Radiation Detection and Measurements	3(2+2)	
3	515 RAD	Physical Principles of Non-Ionizing Radiation	3(2+2)	
<b>Total</b>			<b>(9) Units</b>	

### ○ Second Level:

#	Course Code	Name	No. of Study Units	Pre-requisite
1	517 RAD	Medical Image Processing	3(2+2)	
2	519 RAD	Quality Assurance in Radiology	2(1+2)	
3	551 RAD	Ultrasound Physics and instrumentation	3(2+2)	
<b>Total</b>			<b>(8) Units</b>	

### ○ Third Level

#	Course Code	Name	No. of Study Units	Pre-requisite
1	553 RAD	Abdominal Sonography	3(2+2)	551 RAD
2	554 RAD	Seminar in Medical Ultrasound (1)	1(1+0)	
3	555 RAD	Superficial Parts Sonography	3(2+2)	551 RAD
4	598 RAD	Research Project (1)	2(2+0)	
<b>Total</b>			<b>(9) Units</b>	

### ○ Fourth Level

#	Course Code	Name	No. of Study Units	Pre-requisite
1	---- RAD	Elective Course (1)	3(2+2)	
2	556 RAD	Seminar in Medical Ultrasound (2)	1(1+0)	554 RAD
3	599 RAD	Research Project (2)	2(2+0)	598 RAD
<b>Total</b>			<b>(6) Units</b>	

### ○ List of elective courses (student must select single course from the following):

#	Course Code	Name	No. of Study Units	Pre-requisite
1	557 RAD	Vascular Sonography	3(2+2)	
2	559 RAD	Obs/Gyn Sonography	3(2+2)	

**❖ Study Plan for Medical Radiation Protection Track**  
**A/ Thesis Option**

○ **First Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	511 RAD	Pathophysiology	3(2+2)	
2	513 RAD	Radiation Detection and Measurements	3(2+2)	
3	515 RAD	Physical Principles of Non-Ionizing Radiation	3(2+2)	
<b>Total</b>			<b>(9) Units</b>	

○ **Second Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	517 RAD	Medical Image Processing	3(2+2)	
2	519 RAD	Quality Assurance in Radiology	2(1+2)	
3	561 RAD	Instrumentations In Radiation Protection	3(2+2)	
<b>Total</b>			<b>(8) Units</b>	

○ **Third Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	563 RAD	Radiation Protection Legislation	3(2+2)	561 RAD
2	565 RAD	Dosimetry and Radiobiology	3(2+2)	561 RAD
3	596 RAD	Thesis Proposal Preparation	One unit	(13) units
4	---- RAD	Elective Course (1)	3(2+2)	
<b>Total</b>			<b>(10) Units</b>	

○ **Fourth Level:**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	600 RAD	Thesis	(6) Units	596 RAD
<b>Total</b>			<b>(6) Units</b>	

○ **List of elective courses (student must select single course from the following):**

#	Course Code	Name	No. of Study Units	Pre-requisite
1	567 RAD	Radiation Protection in Diagnostic Radiology	3(2+2)	
2	569 RAD	Radiation Protection in Radiotherapy	3(2+2)	

## B/ Non-Thesis Option

### ○ First Level:

#	Course Code	Name	No. of Study Units	Pre-requisite
1	511 RAD	Pathophysiology	3(2+2)	
2	513 RAD	Radiation Detection and Measurements	3(2+2)	
3	515 RAD	Physical Principles of Non-Ionizing Radiation	3(2+2)	
<b>Total</b>			<b>(9) Units</b>	

### ○ Second Level:

#	Course Code	Name	No. of Study Units	Pre-requisite
1	517 RAD	Medical Image Processing	3(2+2)	
2	519 RAD	Quality Assurance in Radiology	2(1+2)	
3	561 RAD	Instrumentations In Radiation Protection	3(2+2)	
<b>Total</b>			<b>(8) Units</b>	

### ○ Third Level:

#	Course Code	Name	No. of Study Units	Pre-requisite
1	563 RAD	Radiation Protection Legislation	3(2+2)	561 RAD
2	564 RAD	Seminar in Medical Radiation Protection (1)	1(1+0)	
3	565 RAD	Dosimetry and Radiobiology	3(2+2)	561 RAD
4	598 RAD	Research Project (1)	2(2+0)	
<b>Total</b>			<b>(9) Units</b>	

### ○ Fourth Level

#	Course Code	Name	No. of Study Units	Pre-requisite
1	---- RAD	Elective Course (1)	3(2+2)	
2	566 RAD	Seminar in Medical Radiation Protection (2)	1(1+0)	564 RAD
3	599 RAD	Research Project (2)	2(2+0)	598 RAD
<b>Total</b>			<b>(6) Units</b>	

### ○ List of elective courses (student must select single course from the following):

#	Course Code	Name	No. of Study Units	Pre-requisite
1	567 RAD	Radiation Protection in Diagnostic Radiology	3(2+2)	
2	569 RAD	Radiation Protection in Radiotherapy	3(2+2)	