



UMST
UNIVERSITY

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Faculty of Radiological Sciences

B.Sc. (Honors) in Radiological Sciences

Curriculum

2018

**The Curriculum was written on 2005 and reviewed on 2018, 2022
by Curriculum Development and Assessment Committee and approved by
the Curriculum Update Workshop**

Faculty Establishment:

The Faculty of Radiological Sciences FRS is an integral element of the University of Medical Science and Technology UMST. The faculty was established in 2005, and offers 4-year Bachelor's Degree program in Radiological Science.

Faculty Mission:

The mission of the Faculty of Radiological Sciences is to train and educate skillful, knowledgeable and committed Diagnostic Radiographic **Specialist** who has breadth of knowledge, competence in Diagnostic **Specialist**, who shall adhere to professional ethics, and who can contribute successfully as Technologists in the health care team. The Faculty also aims to contribute to the development of the profession and allied health services in Sudan, by providing consultancy and other services.

Faculty Objectives :

1. To develop, monitor, evaluate, review and maintain an undergraduate curriculum that provides: An essential core of knowledge and skills as well as Opportunities to develop clinical competence.
2. To foster the requisite professional attitudes and values in students, who shall adhere to professional ethics and demonstrate concern, responsibility and the ability to interact appropriately with other care providers, administrators, patients and their families.
3. To provide students with the necessary support and guidance in terms of counseling, and feedback on academic and clinical performance.
4. To develop and provide post-graduate programs, short courses, lectures, workshops and seminars.
5. To recruit well qualified and experienced teaching and support staff who will act as role models for students and keep themselves abreast with scientific advances in the field and apply the state-of-the- art in all endeavors: teaching, curriculum development and assessment, research, clinical supervision and community service.
6. To provide consultancy services to hospitals and clinics.

Programmer outcomes:

When this program is successfully completed, the graduate will be able to

1. Use the outputs of basic medical and scientific courses.
2. Apply the principles of radiation protection.
3. Conduct regular, special and advanced radiological examinations
4. Conduct diagnostic X- ray examinations tests
5. Implementing comprehensive quality assurance systems at X-ray department.
6. Work in accordance with ethics and professionalism
7. Participate actively within the team work.
8. Continue to learn and communicate with others.

Programs:

The course of 4 academic years (8 Semesters) leads to a B.Sc. (Honors) in Radiological Sciences.

The program requires a minimum number of contact hours, essential for attaining the requisite professional competence. In addition to lectures, the students get extensive hands-on experience at the university clinical x-ray departments. English is the language of instruction.

Career Opportunities:

Radiological Sciences is the profession whose members have the responsibility to provide skilled technical expertise in Diagnostic X-Ray Departments.

The second senior radiology Specialist is the professional, whose role is to produce radiographs of various body parts and systems, submitting them to the radiologist for diagnostic interpretation.

The graduate's professionals form part of the health care team, headed by a medical doctor, and their professionalism and understanding of the care requirements make their role imperative in health care system. As a Radiological **Specialist**;

1. Graduates find employment in academic hospitals, community health centers, private and public practice.
2. Graduates in diagnostic radiography can also start independent private practices.
3. Other opportunities include post-graduate study

Admission Requirements:

Minimum percentage to be admitted to the faculty by Sudan School Certificate or (Equivalent after evaluation) is 70 %

The Curriculum:

The curriculum includes radiation sciences, radiological imaging, patient care, quality assurance, biostatistics, and research methodology. Responsibilities include the manipulation of sophisticated equipment including computer reconstructed imaging. Graduates possess the skills to assume positions as Radiological **Specialist** and quality assurance co-coordinators and, with experience, positions as manager or instructors in radiology.

The goal of the program is to produce competent, skilled practitioners who can assume positions in hospitals, clinics, research laboratories, industry, and government agencies. To achieve this goal students are enrolled in a course of study that includes anatomy, Physiology, physical, computer and radiation sciences in addition to clinical training in the teaching hospitals and clinics.

The curricular needs are periodically evaluated, and any major changes must go through the Faculty Curriculum Development and Assessment Committee for endorsement and subsequent approval by the University Senate Committee. The total number of credit hours required for graduation is 200 CH.

Examination Regulations

These regulations are supplementary to the General Examination regulation of the University.

1. The award of degrees:

- a. Only registered students who have satisfactorily completed the prescribed courses and passed the Faculty Final Examination shall be eligible for the award of B.Sc. Honors in Radiological Sciences.
- b. A transferred student shall not be awarded the University Certificate unless he/she has spent a minimum period of 50% of the prescribed course duration at the University.

2. Degrees:

B.Sc. (Honors') in Radiological Sciences.

3. Examinations in any subject shall be as follows:

- a. Mid Semester Examinations.
- b. Final Semester Examinations.
- c. Supplementary Examinations.
- d. Substitute Examinations.

4. Debarring:

- a. No candidate shall be admitted to the final examination in any subject unless he/she has obtained a minimum of 85% of attendance in the subject.
- b. A candidate failing to satisfy the examiners in the prescribed course works for any subject may be debarred from the final examination in that subject.
- c. A candidate who fails in one component of a subject, but overall scores are 50% or more may be awarded a pass (at the discretion of the Faculty Board).
- d. The decision of debarring a student from the final examination in any subject is the responsibility of the Faculty Board.
- e. A student who has been debarred from taking an examination in any subject shall be deemed to have failed in that subject.
- f. A student debarred on the ground of article (4.b) may be allowed to sit for a supplementary examination in that specified subject provided that the causes of debarring have been remedied.

5. Examinations, timetable and results approval:

- a. The examinations timetable shall be published at least two weeks in advance of the examinations.
- b. Provisional lists of names, including registration numbers of candidates registered for the Final examinations shall be published at least two weeks in advance. Such publication does not signify the right of entry to the examination, which remains subject to article (4).
- c. Final lists of candidates registered for the final examinations shall be published at least seventy-two (72 hours) in advance.
- d. Examinations and assessment shall be conducted by means of written question paper and/or oral examinations and/or assignments and/or practical examinations. In every case the examiners shall be at liberty to set oral questions to any candidate.

- e. All examination results shall first be presented to the Faculty Board for discussion prior to the University Senate for the final approval.
- f. The decision of the University Senate shall be final in all matters relating to the award of the degree.

6. Total Marks:

A. The total marks for final assessment each subject.

- Mid Semester **30%**
- Final Semester Examination **70%**

1. Theoretical subject without practical hours.

- Test and assignments 15%
- Practical and/or Laboratory 0%
- Final 85%
- Total **100%**

II. Theoretical subject with practical hours.

- Test and assignments 15%
- Practical and/or Laboratory 20%
- Final 65%
- Total **100%**

III. Clinical Practice

- Continuous assessment examination 60%
- Final Examination 40%

Clinical I (10%) + Clinical II (10%) + Clinical III (10%) + Clinical IV (70%)

100% = (log book 20% + OSCE 30 % + Attendance 10% + Final exam 40%)

B. Total marks for final assessment for stop and continuous subjects:

- I. If the course extends for only one semester the marks will be as mentioned in article (6a).
- II. If the course extends for more than one semester marks will be as follows:

1. 70% of the marks will be taken from the Final semester mark of 100% as described in article (6).
2. 30% of the marks will be taken from the previous semester.
3. All continuous subjects shall be terminated in one academic year.
4. The pass mark for any subject shall be 50%.
5. The pass mark of the clinical practice shall be 60%.
6. Where a student is absent for valid reasons at the time of the test, assignment, class work, mid-semester examination etc., an opportunity may be given for the student to demonstrate that he/she has achieved the objectives tested by assessment. Any mark awarded shall be carried forward for calculating the overall subject result.

7. Warnings:

- a. The Grade Point Average (GPA) for the academic year shall be calculated according to the number or credit hours in each course in each academic year.
- b. The GPA shall be calculated to three decimal places and then rounded up two decimal places.
- c. All courses taught shall be included in the GPA calculation (except the Religious Studies, Sudanese Studies and Arabic Language).
- d. After sitting for the final examination of semester 1, a student who scores a GP A less than 2.50 points shall receive a warning. The second warning shall be given after the results of the subsequent final examination and if no improvement as judged by the University Senate is shown after that, the student shall be discontinued from the UMST.
- e. A student who absents himself/herself from the classes or from the final examinations or any semester without reason shall be considered to have failed in all courses and shall be discontinued from the University.
- f. The minimum requirement to pass the academic year shall be grade D without any F, or cGPA <2.50.
- g. A candidate shall obtain a minimum GPA of 2.50 without an F in order to pass or to proceed to the next semester.
- h. If a candidate receives an F, he/she shall sit for the supplementary examination in that course.
- i. Final Examination results showing grades obtained in each subject, GPA and cGPA shall be published following the final approval by the University Senate.

8. Supplementary examinations:

- A.** Phase 1 examination: Phase 1 comprises semesters (1) and (2).
A student shall be allowed to sit for supplementary examinations in 50% or the total number of subjects he/she has failed in the final examination or semester (1) & (2).
- B.** Phase II examination: Phase II comprises second, third & fourth year.
 1. A student shall be allowed to sit for supplementary examination in 50% of the total number of subject he/she has failed in the final examination of the two semesters of each academic year.
 2. If a student fails more than 50% of the total number of subjects of the final examinations of two semesters he/she shall be advised to repeat the academic year.
 3. The University requirements (Religious Studies, Sudanese Studies and Arabic Language) shall be excluded from the calculations of the number of subjects a student shall be allowed to sit for supplementary exams.
 4. A student who fails his/her supplementary examination shall be advised to repeat the academic year.
 5. A student who passes his/her supplementary examinations but fails to attain the required cGPA of 2.50 he /she be advised to repeat the academic year.

6. A student shall not be allowed to repeat the same academic year more than once.
7. A student shall not be allowed to repeat more than twice throughout his study course.
8. The discontinued student shall not be registered again in the Faculty.

9. Grading System:

A rating scale of letters shall be used in all official transcripts:

A+	=	90-100%	} Distinction
A	=	80-89%	
B+	=	70-79%	Very Good
B	=	60-69%	Good
C	=	55-59%	Pass
D	=	50-54%	
F	=	<49.99%	

10. Classification of Final degree (Honors'):

First Class	cGPA 4.50-5.00
Second Class, Division One	cGPA 4.00-4.49
Second Class, Division Two	cGPA 3.50-3.99
Class Three	cGPA 2.50-3.49

- A.** A candidate who fails to attain the pass mark in his / her final semester 8 examinations shall sit for a supplementary.
- B.** cGPA shall be the criteria for the final degree award for Faculties adopting GPA system except in the case of a student who has to repeated his final academic year, where his classification shall be brought one step down.

11. Faculty Prizes:

Faculty Prizes List

Semester	Subject
Semester 5	Digital Image Acquisition & Display Diagnostic Equipment & Maintenance Radiographic Techniques & Related Positioning
Semester 6	Advanced Radiographic Techniques Advanced Radiographic Anatomy
Semester 7	Computerized Tomography Technique Magnetic Resonance Imaging Technique Medical Ultrasound Imaging Technique
Semester 8	Nuclear Medicine Imaging Technique Radiographic Pathology Thesis Best Final Student

Subject prize shall be awarded to the student who scores the highest mark in stop subjects at final semester examination provided that the mark scored is not less than grade (A) and that the rest of the result is not marred by any (F) grade. Each subject prize is to the value or 100US\$ or its equivalent.

Best Final Student Prize

Prize shall be awarded to the best final student who scores the best aggregated throughout his/her academic years. The prize is to the value of US\$ 300 or its equivalent.

Coding System:

The following coding system is adopted where, for example, the code **BS 123**:

BS: stands for Basic Science.

1: stands for the first academic year.

2: stands for second semester.

3: stands for the serial number of the subject.

L — Lecture

TUT — Tutorial

PRA — Practical

CH — Credit Hours

ARB—Arabic Language

REL—Religious Studies

NGL— English language

BS — Basic Science

MS — Medical Science

RAD—Radiology

HUM—Humanity

CURRICULUM SHEET

Semester 1

Course Code	Course Title	Hours/ Week			CH	Exam hours
		L	TUT	PRA		
NGL 111	English Language I *	2	-	-	2	2
MS 112	Medical Terminology	2	-	-	2	2
MS 113	Nursing Skills & First Aid	2	-	2	3	3
BS 114	Computer Application I*	2	-	2	3	3
BS 115	General Chemistry	2	1	2	3	3
BS 116	General Physics *	2	1	2	3	3
BS 117	Biology	4	-	2	5	3
Total		16	2	10	21	-

Semester 2

Course Code	Course Title	Hours/ Week			CH	Exam hours
		L	TUT	PRA		
NGL 121	English Language I	2	-	-	2	2
RAD 122	Fundamental of Radiology	2	-	2	3	2
BS 123	Organic Chemistry	2	-	2	3	3
BS 124	Computer Application II	2	-	2	3	3
MS 125	Human Anatomy *	4	-	2	5	3
BS 126	General Physics	2	-	2	3	3
BS 127	Mathematics	2	-	-	2	2
Total		16	-	10	21	-

Semester 3

Course Code	Course Title	Hours/ Week			CH	Exam hours
		L	TUT	PRA		
NGL 211	English language II *	2	-	-	2	2
MS 212	Biochemistry	2	-	2	3	3
BS 213	Advance Computer	2	-	2	3	3
MS 214	Human Anatomy ☐	4	-	2	5	3
RAD 215	Patient Care & Medical Ethics	2	-	-	2	2
RAD 216	Radiation Physics	2	-	2	3	3
RAD 217	Medical Electronics	2	-	2	3	3
Total		16	-	10	21	-

Semester 4

Course Code	Course Title	Hours/ Week			CH	Exam hours
		L	TUT	PRA		
NGL 221	English language II ☐	2	-	-	2	2
MS 222	Physiology *	2	1	2	3	3
MS 223	General Pathology *	2	1	-	2	2
RAD 224	Radiographic Techniques & Related Positioning *	4	-	2	5	3
RAD 225	Radiographic Anatomy *	2	-	-	2	2
RAD 226	Digital Image Acquisition & Display*	2	-	2	3	3
RAD 227	Diagnostic Equipment & Maintenance *	2	-	2	3	3
RAD 228	Radiation Biology	2	-	2	3	3
RAD 229	Radiation Protection	2	-	2	3	3
Total		20	2	12	26	-

Semester 5

Course Code	Course Title	Hours/ Week			CH	Exam hours
		L	TUT	PRA		
NGL 311	English language III *	2	-	-	0	2
MS 312	Physiology ☐	2	1	2	3	3
MS 313	Introduction to community medicine	2	2	-	3	3
RAD 314	Radiographic Techniques & Related Positioning ☐	4	-	2	5	3
RAD 315	Radiographic Anatomy ☐	2	-	-	2	2
RAD 316	Digital Image Acquisition & Display☐	2	-	2	3	3
RAD 317	Diagnostic Equipment & Maintenance ☐	2	-	2	3	3
MS 318	General Pathology ☐	2	-	-	2	2
RAD 319	Clinical Practice I*	-	-	16	5	3
Total		18	3	24	26	-

Semester 6

Course Code	Course Title	Hours/ Week			CH	Exam hours
		L	TUT	PRA		
NGL 321	English language III ☐	2	-	-	0	2
BS 322	Biostatistics & Research Methodology	2	-	2	3	3
RAD 323	Advanced Radiographic Techniques	2	-	2	3	3
RAD 324	Advanced Radiographic Anatomy	2	-	2	3	3
RAD 325	Computerized Tomography Physics & Instrumentation	2	-	2	3	3
RAD 326	Medical Ultrasound Imaging Physics & Instrumentation	2	-	2	3	3
RAD 327	Magnetic Resonance Imaging Physics & Instrumentation	2	-	2	3	3
RAD 328	Seminar	-	-	2	1	-
RAD 329	Clinical Practice II*	-	-	16	5	3
Total		14	-	30	24	-

Semester 7

Course Code	Course Title	Hours/ Week			CH	Exam hours
		L	TUT	PRA		
NGL 411	English language IV *	2	-	-	0	2
RAD 412	Interventional Radiology	2	-	-	2	2
RAD 413	Computerized Tomography Technique	2	-	2	3	3
RAD 414	Magnetic Resonance Imaging Technique	2	-	2	3	3
RAD 415	Medical Ultrasound Imaging Technique	2	-	2	3	3
RAD 416	Sectional Anatomy *	2	2	-	3	3
RAD 417	Nuclear Medicine Imaging Physics & Instrumentation	2	-	-	2	2
RAD 418	Radiographic Pathology *	2	-	-	2	2
RAD 419	Graduation Project*	-	-	4	0	0
RAD 410	Clinical Practice III*	-	-	18	6	3
Total		16	2	28	24	-

Semester 8

Course Code	Course Title	Hours/ Week			CH	Exam hours
		L	TUT	PRA		
NGL 421	English language IV ☐	2	-	-	0	2
RAD 422	Sectional Anatomy ☐	2	2	-	3	3
RAD 423	Graduation Project ☐	-	-	8	6	3
RAD 424	Radiographic Pathology ☐	2	2	-	3	3
RAD 425	Nuclear Medicine Imaging Technique	2	-	-	2	2
RAD 426	Quality Management in Diagnostic Radiology	2	-	2	3	3
RAD 427	Direct Study	-	-	2	1	-
RAD 428	Clinical Practice IV ☐	-	-	18	6	3
Total		10	4	30	24	-

Program credit Hours	Program contact Hours		
	Total	Theoretical	Lab and clinical practice
187	293 x 14 = 4102	126 x 14 = 1764	167x 14 = 2338
	%	43%	57%