

**Ministry of Higher Education and Scientific Research  
Scientific Supervision and Scientific Evaluation Apparatus  
Directorate of Quality Assurance and Academic Accreditation  
Accreditation Department**



# **Academic Program and Course Description Guide**

**2024**

## **Introduction:**

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

## **Concepts and terminology:**

**Academic Program Description:** The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

**Course Description:** Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

**Program Vision:** An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

**Program Mission:** Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

**Program Objectives:** They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

**Curriculum Structure:** All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

**Learning Outcomes:** A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

**Teaching and learning strategies:** They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

## Academic Program Description Form

**University Name:** University of Mosul

**Faculty/Institute:** College of Dentistry

**Scientific Department:** N/A

**Academic or Professional Program Name:** Dentistry

**Final Certificate Name:** Bachelor's Degree in Oral and Maxillofacial Medicine and Surgery

**Academic System:** Annual

**Description Preparation Date:** 01 March 2024 for the 2023-2024 academic year

**File Completion Date:** 31 March 2024

**Signature:**

**Head of Department Name:**

**Assist. Prov. Dr.**

**Rayan Salem Hamed**

**Date:** 24/4/2024

**Signature:**

**Scientific Associate Name:**

**Assist. Prov. Dr**

**Ali Moayid Rasheed**

**Date:** 24.4.2024

**The file is checked by: Assist. Lec. Ahmed Dheyaa Fakhre**

**Department of Quality Assurance and University Performance**

**Director of the Quality Assurance and University Performance Department;**

**Date:** 21/4/2024

**Signature:**

*Ahmed*

*I authenticate the academic program  
for the academic year 2023-2024*

**Approval of the Dean**



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### 1. Program Vision

Program vision is written here as stated in the university's catalogue and website.

### 2. Program Mission

Program mission is written here as stated in the university's catalogue and website.

### 3. Program Objectives

The College of Dentistry was established in the academic year 1982-1983 to be another basic building block to be added to the rest of the colleges at the University of Mosul. It aims to prepare medical staff specialized in oral and maxillofacial medicine and surgery with a distinguished scientific and professional level. The college contains educational medical clinics in which students are trained. Clinically in modern clinics in all specialties and fields of dentistry (oral and maxillofacial surgery, dental industry, pediatric dentistry, preventive dentistry, orthodontics, dental treatment and periodontal diseases) and with the latest technologies. This is in addition to their teaching in various scientific and applied laboratories, and the duration of study in the college is five years.

### 4. Program Accreditation

Does the program have program accreditation? And from which agency?  
No

### 5. Other external influences

Is there a sponsor for the program?  
No

### 6. Program Structure

Program	Number of	Credit	Percentage	Reviews*
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Structure	Courses	hours		
<b>Institution Requirements</b>	N/A			
<b>College Requirements</b>	First year – 9	38	5%	
	Second year - 8	40	10%	
	Third year - 10	45	15%	
	Fourth year - 9	49	30%	
	Fifth year - 9	53	40%	
<b>Department Requirements</b>	N/A			
<b>Summer Training</b>	Forth year	80 hours		
	Fifth year	80 hours		

\* This can include notes whether the course is basic or optional.

<b>7. Program Description</b>				
<b>Year/Level</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Credit Hours</b>	
			<b>theoretical</b>	<b>practical</b>
<b>First year</b>	<b>101 MP</b>	Medical Physics	60	60
	<b>102 PROG</b>	Computer	30	60
	<b>103 MC</b>	Medical Chemistry	60	60
	<b>104 MBIO</b>	Medical Biology	60	60
	<b>105 DENA</b>	Dental Anatomy	60	60
	<b>106 HRD</b>	Human Rights and Democracy	30	N/A
	<b>107 ENG</b>	English Language and Dental Terminology	30	N/A
	<b>108 HUMA</b>	Human Anatomy	30	60
	<b>109 ARL</b>	Arabic Language	30	N/A

## 7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
Second year	<b>201 HUMA</b>	Human Anatomy	30	60
	<b>202 PROS</b>	Prosthodontics	30	120
	<b>203 GHIS</b>	General Histology	60	60
	<b>204 MPHS</b>	Medical Physiology	60	60
	<b>205 BICH</b>	Biochemistry	60	60
	<b>206 OHISE</b>	Oral Histology and Embryology	60	60
	<b>207 DM</b>	Dental Materials	30	60
	<b>208 BSBS</b>	Biosecurity and Biosafety	15	30

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
Third year	<b>301 PROS</b>	Prosthodontics	30	90
	<b>302 OSUR</b>	Oral Surgery	30	60
	<b>303 MICB</b>	Microbiology	60	60
	<b>304 GPATH</b>	General Pathology	60	60
	<b>305 PHAR</b>	Pharmacology	60	60
	<b>306 PCOD</b>	Preclinical Operative Dentistry	30	60
	<b>307 COMD</b>	Community Dentistry	30	60
	<b>308 DRAD</b>	Dental Radiology	30	60
	<b>309 PFP</b>	Preclinical Fixed Prosthodontics	30	60
	<b>310 DETH</b>	Dental Ethics	30	N/A

<b>7. Program Description</b>
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Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
Fourth year	<b>401 PERI</b>	Periodontology	30	90
	<b>402 ORTH</b>	Orthodontics	30	120
	<b>403 OSUR</b>	Oral Surgery	30	120
	<b>404 COND</b>	Operative and Esthetic Dentistry and Endodontics	30	180
	<b>405 OPATH</b>	Oral Pathology	60	90
	<b>406 PROS</b>	Prosthodontics	30	90
	<b>407 GMED</b>	General Medicine	30	60
	<b>408 GSUG</b>	General Surgery	30	60
	<b>409 PED</b>	Paediatric Dentistry	30	60

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
Fifth year	<b>501 PERI</b>	Periodontology	30	90
	<b>502 PRVD</b>	Preventive Dentistry	30	90
	<b>503 OSUR</b>	Oral Surgery	30	180
	<b>504 PROS</b>	Prosthodontics	30	180
	<b>505 CECP</b>	Clinical Endodontics and Clinical Fixed Prosthodontics	30	180
	<b>506 ORTH</b>	Orthodontics	30	120
	<b>507 PEDO</b>	Pedodontics	30	90
	<b>508 OMED</b>	Oral Medicine	30	120
	<b>509 RESP</b>	Research Project	30	N/A

8. Expected learning outcomes of the program
<b>A. Knowledge</b>



1. The student acquires comprehensive knowledge of the scientific terminology used in dentistry and the theoretical material.	1. Theoretical tests and practical tests.
2. Familiarize the students with different types of materials and devices used in dentistry.	2. Practical laboratories tests.
3. Enhancing the student's confidence to deal with all types of patients.	3. Practical mannequin skills tests.
4. Developing the student's ability to deal with different therapeutic cases.	4. Clinical tests on patients.
5. Strengthening the principle of participation students group discussions to discuss a medical condition and the method of its treatment.	5. Scientific reports and academic studies.
6. Providing the student with complete knowledge to enable him to prepare an integrated treatment plan for the patients.	6. Clinical tests on patients.
<b>B. Skills</b>	
1. Promoting professional ethics and patients' treatment approach between the graduates.	1. Clinical tests on patients.
2. Acquirement of various therapeutic skills for the students.	2. Clinical tests on patients.
3. Promoting the principle of continuous education to continue developing the dental profession.	3. Scientific reports and academic studies.
<b>C. Ethics</b>	
1. The skill of thinking according to the student's ability (let think about thinking	1. The student to believe in what is tangible (the student's ability) and to

ability).	understand when, what and how he should think and work to improve the ability to think reasonably.
2. Critical thinking skill.	2. Aims to pose a problem, analyze it logically, and reach the solution.
3. The balance between freedom and responsibility.	3. Enhances student's awareness of the necessity of balance between freedom and responsibility, to determine the best treatment for the patients.
4. Decision making ability	4. Enhances student's skill of making the right decision for the benefit of the patient based on logical thinking.

### 9. Teaching and Learning Strategies

- Giving lectures.
- Providing students with lectures on the college website.
- Educational videos.
- Utilization of projectors and digital cameras.
- Use of educational models.
- Training courses and workshops.
- Applied clinical education.
- Focused student group discussion.

### 10. Evaluation methods

- Theoretical tests.
- Oral exams.
- Laboratory practical tests.
- Practical mannequin tests.
- Practical tests on patients.
- Scientific reports and academic studies.
- Final year research project (Fifth year).

### 11. Teaching staff

Academic Rank	Specialization		Number of the teaching staff		
	General	Special	Skills	Staff	Temp

Professor	Science	Microbiology		1	0
Professor	Dentistry	Oral and dental pharmacology		2	0
Professor	Pharmacy	General pharmacology		2	0
Professor	Dentistry	Conservative dentistry		1	0
Professor	Veterinary medicine	Human anatomy		1	0
Professor	Dentistry	Orthodontics		1	0
Professor	Dentistry	Oral and maxillofacial surgery		2	0
Professor	Dentistry	Operative dentistry		1	0
Assistant professor	Statistics	Applicable statistics		2	0
Assistant professor	Science	Oral microbiology		2	0
Assistant professor	Science	Intelligence technology		1	0
Assistant professor	Dentistry	Conservative dentistry		7	0
Assistant professor	Science	Physics		1	0
Assistant professor	Dentistry	Oral pathology		1	0
Assistant professor	Dentistry	Orthodontics		15	0
Assistant professor	Dentistry	Oral and maxillofacial surgery		5	0
Assistant professor	Dentistry	Prosthodontics		10	0
Assistant professor	Dentistry	Preventive dentistry		2	0
Assistant professor	Dentistry	Oral medicine		1	0
Assistant professor	Science	Biochemistry		2	0
Assistant	Science	Industrial chemistry		1	0

professor					
Assistant professor	Science	Physiology		1	0
Assistant professor	Literature	Arabic language		1	0
Assistant professor	Dentistry	Operative dentistry		5	0
Lecturer	Dentistry	Oral microbiology		2	0
Lecturer	Pharmacology	Oral pharmacology		3	0
Lecturer	Dentistry	Dental radiology		2	0
Lecturer	Science	Microbiology (bacteria)		1	0
Lecturer	Dentistry	Anatomy and histology		1	0
Lecturer	Dentistry	Endodontics		2	0
Lecturer	Science	Medical physiology		1	0
Lecturer	Science	Chemistry		1	0
Lecturer	Science	Biochemistry		1	0
Lecturer	Dentistry	Periodontology		2	0
Lecturer	Dentistry	Oral histology		2	0
Lecturer	Science	Histology / physiology		2	0
Lecturer	Science	Biotechnology		1	0
Lecturer	Dentistry	Orthodontics		11	0
Lecturer	Dentistry	Oral and maxillofacial surgery		8	0
Lecturer	Dentistry	Prosthodontics		18	0
Lecturer	Dentistry	Preventive dentistry		1	0
Lecturer	Dentistry	Oral medicine		3	0
Lecturer	Dentistry	Conservative dentistry		8	0
Lecturer	Science	Biology		2	0
Lecturer	Science	Physics		1	0
Lecturer	Veterinary medicine	Veterinary physiology		1	0
Lecturer	Science	Medical physics		1	0
Lecturer	Science	Biochemistry		1	0
Lecturer	Science	Organic chemistry		1	0
Lecturer	Dentistry	Operative dentistry		6	0
Lecturer	Dentistry	Oral and maxillofacial		1	0

		tissue engineering			
Assistant lecturer	Business and administration	Strategic administration		1	0
Assistant lecturer	Biology	Oral microbiology		1	0
Assistant lecturer	Literature	Translation		1	0
Assistant lecturer	Economy and administration	Legal accountancy		1	0
Assistant lecturer	Dentistry	General pathology		1	0
Assistant lecturer	Dentistry	General histology		1	0
Assistant lecturer	Dentistry	Orthodontics		9	0
Assistant lecturer	Dentistry	Oral and maxillofacial surgery		9	0
Assistant lecturer	Dentistry	Prosthodontics		13	0
Assistant lecturer	Dentistry	Preventive dentistry		6	0
Assistant lecturer	Dentistry	Conservative dentistry		15	0
Assistant lecturer	Veterinary medicine	Veterinary medicine surgery		1	0
Assistant lecturer	Veterinary medicine surgery	Physiology		2	0
Assistant lecturer	Dentistry	Paediatric dentistry		1	0
Assistant lecturer	Science	Chemistry science		1	0
Assistant lecturer	Engineering	Medical devices engineering		2	0
Assistant lecturer	Engineering	Electrical and computer engineering		1	0

Assistant lecturer	Technical engineering	Medical devices electronic engineering		2	0
Assistant lecturer	Engineering	Computer engineering		2	0

## 12. Professional Development

### Mentoring new faculty members

The enrolment of our teaching staff in the teaching skills development courses held by the University of Mosul through teaching methodologies courses and teaching suitability tests.

The enrolment of our teaching staff in English and Arabic language development courses for teaching and promotion purposes organized by the University of Mosul.

The enrolment of our teaching staff in computer skills and medical statistics courses to develop their skills in using modern technologies in teaching.

### Professional development of faculty members

Continuously working to measure the performance level of the teaching staff and comparing it with their counterpart in similar educational institutions. Also, to evaluate the teaching staff performance continuously by logging it into integrated database that allows for proper feedback system, which ultimately contributes to the enhancement of the educational level, that is aiming at advancing the level of quality of services provided to patients.

Organizing continuing education programs for the teaching staff and practicing dentists from other health institutions to develop their scientific, professional and research capabilities. Hence, ensuring the continuous renewal of their information and intellectual capabilities through periodic specialized discussion groups.

## 13. Acceptance Criterion

Admission criteria include students who have a certain cumulative average according to the central admission system. Students who have the physical, mental, and social ability to manage any medical condition or practice required for study are also selected. Most dental schools require personal interviews with candidates to evaluate qualities such as the desire to help people, self-confidence, and ability to take on challenges, ability to work with people and ability to work independently.

### **11. The most important sources of information about the program**

1. The college and university websites.
2. The university guide booklet.
3. College books and scientific sources.

### **12. Program Development Plan**

Striving through twinning with corresponding dental colleges in prestigious universities locally, regionally and internationally to enhance the academic and scientific performance of the teaching staff and students in the college. Also, through the participation in the academic and scientific forums and meeting locally, regionally and internationally.

The continuous discussion to achieve the best benefit of the e-learning and to increase its impact on the education system to adopt it as adjunct to the traditional teaching methods. As well as, the continuous endeavour of the college to develop its teaching staff in order to advance the educational process to continue the advancement with the latest teaching methods.

Program Skills Outline															
				Required program Learning outcomes											
Year / Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First year	101 MP	Medical Physics	Basic	√	√			√	√	√	√	√	√	√	√
	102 PROG	Computer	Basic	√	√			√	√	√	√	√	√	√	√
	103 MC	Medical Chemistry	Basic	√	√			√	√	√	√	√	√	√	√
	104 MBIO	Medical Biology	Basic	√	√			√	√	√	√	√	√	√	√
	105 DENA	Dental Anatomy	Basic	√	√			√	√			√	√		
	106 HRD	Human Rights and Democracy	Basic	√	√			√	√	√		√	√	√	√
	107 ENG	English Language and Dental Terminology	Basic	√	√	√	√	√	√			√	√	√	√
	108 HUMA	Human Anatomy	Basic	√	√	√	√	√	√			√	√	√	√
	109 ARL	Arabic Language	Basic	√	√	√		√	√			√	√	√	√

√ Please tick the boxes corresponding to the individual program learning outcomes under evaluation.



Program Skills Outline															
				Required program Learning outcomes											
Year / Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Second year	201 HUMA	Human Anatomy	Basic	√	√	√		√	√		√	√	√		
	202 PROS	Prosthodontics	Basic	√	√			√	√		√	√	√	√	√
	203 GHIS	General Histology	Basic	√	√	√		√	√		√	√	√	√	
	204 MPHS	Medical Physiology	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	205 BICH	Biochemistry	Basic	√	√	√		√	√			√			
	206 OHISE	Oral Histology and Embryology	Basic	√	√			√	√			√	√		
	207 DM	Dental Materials	Basic	√	√			√	√	√	√	√	√	√	√
	208 BSBS	Biosecurity and Biosafety	Basic	√	√			√				√	√	√	

√ Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

Program Skills Outline															
				Required program Learning outcomes											
Year / Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Third year	301 PROS	Prosthodontics	Basic	√	√	√	√	√	√	√	√	√	√		
	302 OSUR	Oral Surgery	Basic	√	√	√	√	√	√		√	√	√		√
	303 MICB	Microbiology	Basic	√	√	√		√	√	√		√	√	√	
	304 GPATH	General Pathology	Basic	√	√			√	√			√	√		√
	305 PHAR	Pharmacology	Basic	√	√	√	√	√	√			√			
	306 PCOD	Preclinical Operative Dentistry	Basic	√	√	√		√	√	√	√	√	√		
	307 COMD	Community Dentistry	Basic	√	√	√		√	√	√		√	√	√	√
	308 DRAD	Dental Radiology	Basic	√	√			√	√	√	√	√	√	√	√
	309 PFP	Preclinical Fixed Prosthodontics	Basic	√				√	√		√	√			
	310 DETH	Dental Ethics	Basic	√				√	√			√			

√ Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

Program Skills Outline															
				Required program Learning outcomes											
Year / Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Fourth year	401 PERI	Periodontology	Basic	√	√	√		√	√			√	√		
	402 ORTH	Orthodontics	Basic	√	√	√	√	√	√			√	√		
	403 OSUR	Oral Surgery	Basic	√	√	√		√	√	√		√	√		
	404 COND	Operative and Esthetic Dentistry and Endodontics	Basic	√	√	√		√	√			√	√	√	
	405 OPATH	Oral Pathology	Basic	√	√	√		√		√		√			
	406 PROS	Prosthodontics	Basic	√	√	√		√	√			√	√		
	407 GMED	General Medicine	Basic	√	√	√		√	√	√		√	√	√	
	408 GSUG	General Surgery	Basic	√	√	√		√	√	√		√	√	√	
	409 PED	Paediatric Dentistry	Basic	√	√	√		√	√			√			

√ Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

Program Skills Outline															
				Required program Learning outcomes											
Year / Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Fifth year	501 PERI	Periodontology	Basic	√	√	√	√	√	√	√		√	√		
	502 PRVD	Preventive Dentistry	Basic	√	√	√		√	√	√		√	√		
	503 OSUR	Oral Surgery	Basic	√	√			√	√	√	√	√	√		
	504 PROS	Prosthodontics	Basic	√	√	√		√	√	√		√	√	√	√
	505 CECP	Clinical Endodontics and Clinical Fixed Prosthodontics	Basic	√	√	√		√	√	√		√	√		
	506 ORTH	Orthodontics	Basic	√	√	√	√	√	√	√	√	√	√	√	√
	507 PEDO	Pedodontics	Basic	√				√	√			√			
	508 OMED	Oral Medicine	Basic	√	√	√		√	√	√		√	√	√	
	509 RESP	Research Project	Basic	√	√	√		√	√	√		√	√		

√ Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

## Course Description Forms – First year

### Course Description Form

<b>1. Course Name:</b>					
Medical Physics					
<b>2. Course Code:</b>					
<b>101 MP</b>					
<b>3. Semester / Year:</b>					
First year					
<b>4. Description Preparation Date:</b>					
01 March 2024					
<b>5. Available Attendance Forms:</b>					
Theoretical and practical					
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>					
Theoretical: 60 hours, practical: 60 hours. Total units: 6					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
Name: Assistant professor Atyaf Subhi Alrawas Email: atyafalrawas@uomosuledu.iq					
<b>8. Course Objectives</b>					
<b>Course Objectives</b>	<ul style="list-style-type: none"> <li>- Introduction to basic physics.</li> <li>- Study of medical physics related to dentistry.</li> <li>- Practical experiments for physical properties and phenomena.</li> </ul>				
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>	<ul style="list-style-type: none"> <li>- Theory lectures and practical laboratories.</li> <li>- Educational videos and utilization of smart boards.</li> <li>- Use of educational models.</li> <li>- Focused student group discussion.</li> </ul>				
<b>10. Course Structure</b>					
<b>Week</b>	<b>Hr</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
1	2	Terms: Medical Physics, physical medicine, Health Physics, Radiological Physics, clinical physics.	Terminology	Theory lectures	Theory exam
2	2	Modeling, Accuracy, Precision, False Positive, False Negative.	Terminology	Theory lectures	Theory exam

3	2	Static forces :( type of levers with medical examples).	Force on &in body	Theory lectures	Theory exam
4	2	Dynamic forces (Centrifuge)	Force on &in body	Theory lectures	Theory exam
5	2	Bones:(Function of bones, Composition of bone, bone remodeling, compact and trabecular bone)	Physics of the skeleton	Theory lectures	Theory exam
6	2	Stress-strain curve: (compressive and tensile stress, young modulus). Bone joints: (Synovial fluid, coefficient of a joint).	Physics of the skeleton	Theory lectures	Theory exam
7	2	Physical basis of heat and temperature, Temperature scales, Converting Temperatures, Temperature in Dentistry, Thermal expansion, (Linear, Area, Volume Thermal Expansion).	Heat and cold in medicine	Theory lectures	Theory exam
8	2	Thermometry, Heat therapy, Thermography, Cold in medicine and cryosurgery. Thermal conductivity.	Heat and cold in medicine	Theory lectures	Theory exam
9	2	First law of thermodynamic. Energy change in the body (Met, Basal metabolic rate (BMR)).	Energy, work and power of the body	Theory lectures	Theory exam
10	2	Work and power. Efficiency heat losses from the body. Anaerobic phase and aerobic phase. Hypothalamus (body's thermostat).Heat lost by (radiation, convection, evaporation of sweat and respiration).	Energy, work and power of the body	Theory lectures	Theory exam
11	2	Definition, absolute pressure, gauge pressure, negative pressure, unit of pressure. Measurement of pressure in the body (Manometer).	Pressure	Theory lectures	Theory exam
12	2	Pressure inside the skull. Eye pressure. Pressure in the skeleton. Pressure in the urinary	Pressure	Theory lectures	Theory exam

		bladder. Boyle's law: (pressure while diving). HOT (hyperbaric oxygen therapy).			
13	2	Electrical potential of nerves (resting potential, action potential in myelinated and unmyelinated nerves) Electromyogram (EMG).	Electricity within the body	Theory lectures	Theory exam
14	2	Electrical potential in the heart (electrocardiogram Electroencephalogram (EEG).	Electricity within the body	Theory lectures	Theory exam
15	2	Properties of sound.	Sound in medicine	Theory lectures	Theory exam
16	2	Stethoscope (including heart sound), mechanism of hearing.	Sound in medicine	Theory lectures	Theory exam
17	2	(A-scan, B-scan, M-scan and Doppler effect).	Ultrasound	Theory lectures	Theory exam
18	2	Physiological effect of ultrasound in therapy.	Ultrasound	Theory lectures	Theory exam
19	2	Light nature, Planck Equation, (Reflection, Refraction and Absorption of Light, Properties of light).	Light in medicine	Theory lectures	Theory exam
20	2	Diffuse reflection, Specular reflection, Phototherapy, Application of ultraviolet and infrared light in medicine, Tanning and Skin Cancer.	Light in medicine	Theory lectures	Theory exam
21	2	What is laser? Application of laser in medicine. Atomic Transitions, Population inversion, Laser Typical Characteristics.	Laser in medicine	Theory lectures	Theory exam
22	2	General Applications of Laser, Laser Dental. Applications, Reshape gum tissue, Laser aided teeth whitening, Laser Drill.	Laser in medicine	Theory lectures	Theory exam
23	2	Focusing element of the eye (cornea, lens).	Physics of eye and vision	Theory lectures	Theory exam
24	2	Element of the eye (pupil, aqueous humor, vitreous humor, sclera). Visual acuity, Snellen chart, optical density.	Physics of eye and vision	Theory lectures	Theory exam
25	2	Properties of X-ray, production	Physics of	Theory	Theory

		of X-ray. Absorption of X-ray, contrast media-ray image (penumbra, grid, and intensifying screens).	diagnostic X-ray	lectures	exam
26	2	Radiation to patients from X-ray (filters).	Physics of diagnostic X-ray	Theory lectures	Theory exam
27	2	Radioactivity decay, half-life, units. Basic instrumentation and its medical application (GM-tube, Photomultiplier tube, scintillation detector, solid state detector).	Physics of nuclear medicine	Theory lectures	Theory exam
28	2	Therapy with radioactivity. Radiation doses in nuclear medicine.	Physics of nuclear medicine	Theory lectures	Theory exam
29	2	The dose units (Rad and Gray). Principles of radiation therapy.	Physics of radiation therapy	Theory lectures	Theory exam
30	2	Brach therapy, quality factor (QF).	Physics of radiation therapy	Theory lectures	Theory exam

#### 11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

#### 12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	



