

**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: Ibn Sina University of Medical and Pharmaceutical Sciences

Faculty/Institute: College of Dentistry

Scientific Department: Basic Science

Academic or Professional Program Name: Medical Physics

Final Certificate Name: Bachelor of Dentistry

Academic System: Year

Description Preparation Date: 2024/11/22

File Completion Date: 2024/11/25

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. Program Vision

The College of Dentistry seeks to be a distinguished institution in all practical and academic aspects, capable of providing the highest international standards of quality in teaching, training, and scientific research for college students. The college also aims to prepare students capable of working in the private and public sectors, and to contribute to providing advanced dental care in Iraq.

2. Program Mission

Working to prepare and graduate students according to modern curricula and educational centers that keep pace with global developments in dentistry, and graduate them as experienced and qualified dentists for the future who can provide the best medical and therapeutic services to citizens.

3. Program Objectives

Preparing the student to achieve a high level of scientific proficiency by establishing a solid foundation in the fundamental principles of physics.

4. Program Accreditation

5. Other external influences

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	180	180		Basic course
College Requirements	Yes			

Department Requirements	Yes			
Summer Training	No			
Other				

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

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
2024/2025		Medical physics	Theoretical	Practical
			180	180

8. Expected learning outcomes of the program
Knowledge
<ol style="list-style-type: none"> 1. Understand the fundamental concepts of physics and their applications in dentistry. 2. Identify the different types of rays, their interactions with matter, and how to utilize them for dental imaging. 3. Study the effects of X-rays on tissues and teeth, and establish safe radiation dose guidelines. 4. Learn the principles and applications of radiography in diagnosing diseases and dental issues. 5. Explore methods for prevention and safety when using X-rays in dentistry. 6. Stay informed about modern technologies and advancements in medical physics and their applications in dentistry.
Skills
<p>Skills Objectives for Students:</p> <ol style="list-style-type: none"> 1. Analysis and Interpretation Skills: Develop the ability to analyze physical phenomena related to dentistry and interpret their effects on dental tissues and teeth. 2. Measurement and Analysis Skills: Acquire skills to make accurate measurements and analyze physical data obtained from imaging and analytical devices. 3. Planning and Organization Skills: Learn to create effective plans for the optimal use of radiology and imaging in diagnosing dental conditions. 4. Interaction and Communication Skills: Cultivate the ability to communicate effectively with the medical team and patients, conveying information and explaining physical findings clearly. 5. Safety and Security Skills: Adhere to radiation safety rules and procedures, ensuring safe practices while using X-rays in dentistry. 6. Self-Learning Skills: Develop the ability to pursue ongoing learning and stay updated on recent developments and research in the field of medical physics.

Ethics

Motivation and Enthusiasm: Fostering a desire for students to learn medical physics, while encouraging them to actively engage in their studies and interact effectively with academic content.

Confidence and Pride: Building students' self-confidence in understanding and applying physical concepts relevant to the field of dentistry.

Critical Thinking: Promoting the development of students' abilities to think critically and evaluate information and physical results in a logical and thoughtful manner.

Inspiration and positivity: Motivating students to explore professional and research development opportunities in medical physics and inspiring them to achieve their personal and professional ambitions.

Respect and Collaboration: Promote the value of respect and cooperation among students, faculty, and clinical teams to achieve a collaborative and respectful learning environment.

Integrity and Responsibility: Promoting integrity and responsibility in using radiology and handling physical information and data carefully and safely.

9. Teaching and Learning Strategies

- Microsoft power point lecture method
- Discussion and seminars
- Report method and practical works

10. Evaluation methods

1. Semester exams
2. Shared homework
3. Student participation in classroom activities
4. Report creation
5. Mid-course grades

11.	12. Faculty		
	Faculty Members		
Academic Rank	Specialization	Special Requirements/ Skills (if applicable)	Number of the teaching staff

		General	Special		Staff	Lecturer
Theoretical	Lecturer	Applied physics sciences	Applied physics sciences		1	
	Assistant Lecturer	Physics sciences	Physics sciences		2	
Practical (Lab.)	Assistant Lecturer	Physics sciences	Physics sciences		4	
	Bachelor	Physics sciences	Physics sciences		1	

Professional Development
Mentoring new faculty members
Professional development of faculty members

13. Acceptance Criterion

14. The most important sources of information about the program

15. Program Development Plan
<ol style="list-style-type: none"> 1. Develop a study plan that aligns with the academic accreditation standards for your specialization. 2. Continuously update academic curricula to keep pace with advancements in science and scientific research.

3. Actively seek opportunities to connect with reputable universities through research collaborations, visits, and cultural exchanges, in order to enhance theoretical knowledge and gain valuable experience in the field of science.

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		Medical Physics	Basic												

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

Course Description Form

1. Course Name:
Medical Physics / 1 th class
2. Course Code:
3. Semester / Year:
Year
4. Description Preparation Date:
22/11/2024
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
180 hours / 6 credits
7. Course administrator's name (mention all, if more than one name)
Theoretical Name: Lect. Dr.Huda Najm Abed Email: Huda.najm@ibnsina.edu.iq Name: Ass.Lec. Abeer mohammed Email: Abeer.mohammed@ibnsina.edu.iq Name: Ass.Lec. Lubaba Abdulkareem Email: lubaba.abdulkareem.g@ibnsina.edu.iq Practical Name: Ass.Lec. Abdullah Mohammed Redha Email: abdullahalhusseiny@inbsina.edu.iq Name: Ass.Lec. Ola abd ulkareem nori Email: ola.abdulkareem@ibnsina.edu.iq Name: Ass.Lec. Ali Amir Qasim Email: ali.abdan@ibnsina.edu.iq Name: Ass.Lec. Nada Adnan Sabri Email: nada.adnan.sa@ibnsina.edu.iq Name: Thekra Ridha Hassien Email: thikraridhah@gmail.com
8. Course Objectives

1. **Fundamental Concepts:** To understand the core physical concepts and principles applied in the field of dentistry.
2. **Practical Applications:** To apply basic physical principles for an in-depth understanding of fundamental sciences through laboratory experiments.
3. **Safety and Security:** To learn radiation safety guidelines and adhere to safe practices when using radiological techniques in dentistry.
4. **Practical Utilization:** To apply acquired knowledge and skills in the field of dentistry, enhancing oral healthcare services.
5. **Updates and Development:** To stay updated with recent advancements in medical physics and its applications, aiming for continuous improvement in knowledge and performance.

These primary objectives comprehensively contribute to achieving the course goals, developing students' abilities to understand and effectively apply physical concepts related to dentistry in practical settings.

9. Teaching and Learning Strategies

Strategy	<ol style="list-style-type: none"> 1. Microsoft power point lecture method 2. Discussion method. 3. Report method. 4. The hip shop method. 5. Practical training in educational clinics located in the college.
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10. Course Structure

Week	Hours	Required Learning Outcomes		Unit or subject name	Learning method	Evaluation method
		Theory	Laboratory			
1	2 Theory 2 Lab.	lect.1 introduction to medical physics	The Graph	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam

2	2 Theory 2 Lab.	lect.2 Forces on and in the Body	Simple Pendulum	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
3	2 Theory 2 Lab.	lect.3 Mechanics of bones materials	Hook's law	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
4	2 Theory 2 Lab.	lect.4 Physics of the skeleton	The Stefan- Poltzman law	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
5	2 Theory 2 Lab.	lect.5 Heat and cold in medicine	Viscosity of Liquid	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
6	2 Theory 2 Lab.	lect.6 Heat and cold in medicine part 2	Ohm's law	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam

7	2 Theory 2 Lab.	lect.7 Electricity with in the human body part1	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
8	2 Theory 2 Lab.	lect.8 Electricity within the human body part 2	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
9	2 Theory 2 Lab.	lect.9 Energy work and power of the body	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
10	2 Theory 2 Lab.	lect.10 sound in medicine	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
11	2 Theory 2 Lab.	lect.11 Ultrasound in medicine	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam

12	2 Theory 2 Lab.	lect.12 Physics of hearing	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
13	2 Theory 2 Lab.	lect.12 Physics of hearing	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
14	2 Theory 2 Lab.	lect.13 Laser in medicine	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
15	2 Theory 2 Lab.	lect.14Physics of eye and vision	Refractive index of glass	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
16	2 Theory 2 Lab.	lect.15 pressure in medicine	The focal length of the convex lens	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam

17	2 Theory 2 Lab.	lect.16 physics of cardiovascular system	Diffraction laser light	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
18	2 Theory 2 Lab.	lect.17 Physics of lung and breathing part 1	Focal length of concave mirror	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
19	2 Theory 2 Lab.	lect.18 Physics of Diagnostic X- ray	The diffraction grating spectrometer	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
20	2 Theory 2 Lab.	Physics of Diagnostic X- ray -Part 2	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
21	2 Theory 2 Lab.	X-Ray Part 3	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam

22	2 Theory 2 Lab.	Physics of Nuclear Medicine-Part 1	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
23	2 Theory 2 Lab.	Physics of Nuclear Medicine-Part 2	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
24	2 Theory 2 Lab.	Radioactivity	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
25	2 Theory 2 Lab.	Radioactivity- Part 2	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
26	2 Theory 2 Lab.	Radioactivity- Part 3	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam

27	2 Theory 2 Lab.	Radioactivity- Part 4	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
28	2 Theory 2 Lab.	Physics of Radiation Therapy	Seminars	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
29	2 Theory 2 Lab.	Radiation Protection in Medicine	Review	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam
30	2 Theory 2 Lab.	Computers in Medicine	Review	Medical Physics	Microsoft power point lecture method, Discussion method., Report method, Practical works	Daily, weekly, monthly exam, midyear and final exam

11. Course Evaluation

Distributing the score out of 100 according to the followings: 20% first and second semesters. 20% mid year exam, 60% final exam (35% theory + 25% Laboratory)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Medical physics (John R. Cameron ,James G. Skofronick)
Main references (sources)	Medical physics (John R. Cameron ,James G. Skofronick)
Recommended books and references (scientific journals, reports...)	<p>1- Introduction to Radiological Physics and Radiation Dosimetry" by Frank H. Attix and Gene W. Almond.</p> <p>2- "The Essential Physics of Medical Imaging" by Jerrold T. Bushberg, John M. Boone, Edwin M. Leidholdt Jr., and Michael J. Leidholdt.</p> <p>3- "Radiation Detection and Measurement" by Glenn F. Knoll.</p>
Electronic References, Websites	<ol style="list-style-type: none">1. RadiologyInfo.org2. AAPM (American Association of Physicists in Medicine3. IAEA (International Atomic Energy Agency4. Radiopaedia.org5. MedicalPhysicsWeb6. eMedicine7. Khan Academy8. Physics in Medicine & Biology Journal

