

URUK University

جامعة اوروك



***First Cycle – Bachelor's Degree (B.Sc.) – of Health
Physics and Radiation Therapy Engineering
Techniques Department***

بكالوريوس - قسم هندسة تقنيات الفيزياء الصحية والعلاج الإشعاعي



Academic Program Description

University Name: URUK University

Faculty/Institute: Technical Engineering College

Scientific Department: Health Physics and Radiation Therapy Engineering Techniques

Academic or Professional Program Name: Bachelor of Health Physics and Radiation therapy engineering techniques.

Final Certificate Name: Bachelor of Health Physics and Radiation therapy engineering techniques.

Academic System: Bologna System (First Level)

Description Preparation Date: 15/5/2026

File Completion Date: 1/11/2025

Signature: 

Head of Dep. Name:

Asst. prof. Dr. Mazin Shakir Jasim

Date: 29/8/2026

Signature: 

Scientific Associate Name:

Asst. Prof. Dr. Fali Hamzah Edan

Date: 29/8/2026

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Authentication by the Dean

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1. Program Vision

The vision of the Department of The Department of Health Physics and Radiation Therapy Engineering Techniques at Uruk University / Technical Engineering College seeks to be a fundamental contributor in preparing highly qualified specialized cadres. These cadres will serve broad sectors in the medical, engineering, and industrial fields in both public and private sectors.

2. Program Mission

To prepare distinguished engineers in the field of Health Physics and Radiation Therapy Engineering Techniques who contribute to community development, enhance scientific awareness, and provide solutions to developmental and technological challenges. The department also seeks to strengthen the role of the college in building institutions and advancing engineering practice to achieve comprehensive development within the framework of human values and concepts. It also aims to establish and reinforce cooperation with local and international engineering and medical institutions.

3. Program Goals

In light of rapid scientific and technological advancement in medical and engineering fields, the department works toward achieving strategic objectives that enable it to attain a distinguished position within health and medical communities.

Main objectives include:

1. Graduating qualified engineers in Health Physics and Radiation Therapy Engineering Techniques capable of analysis, solving practical problems, and efficiently handling advanced

technologies.

2. Preparing graduates for postgraduate studies inside and outside Iraq and for research center employment.
3. Participating in applied research in the field and contributing to community service.
4. Contributing effectively to community development, improving education and continuous training, organizing conferences and seminars, and adopting continuous improvement methodologies.

4. Program Student learning outcomes

A) Knowledge Outcomes

1. Ability to apply knowledge in medical sciences and engineering.
2. Understanding professional and ethical responsibilities.
3. Ability to evaluate course outcomes with faculty members, health practitioners, employers, and graduates for improvement.
4. Development of leadership skills and ethical commitment.

B) Program-Specific Skills

1. Ability to work in multidisciplinary teams.
2. Ability to design and conduct experiments and analyze medical and engineering data.
3. Ability to use modern technologies, tools, and medical equipment.
4. Ability to identify and formulate medical and engineering problems.

C) Value-Based Outcomes

1. Effective communication skills with professionals in medical and engineering fields
Recognition of the need for lifelong learning.
2. Recognition of the need for lifelong learning.
3. Awareness of contemporary issues in the field.
4. Understanding the global impact of medical and engineering solutions.

D) General and Transferable Skills

1. Ability to manage and operate medical and engineering equipment in hospitals.
2. Ability to design electronic systems for medical and engineering applications using modern design and simulation software under realistic constraints.

5. Teaching and learning strategies

1. explanation and clarification by mean of lectures.
2. e-learning on campus.

3. the way of displaying scientific materials with projectors: data show, smart boards, plasma screens.
4. self-learning through homework assignments and mini-projects within lectures.
5. applied education and Experimental Education (laboratories) and work within multiple groups in workshops.
6. graduation projects and case studies (graduation projects) in providing a description that includes scientific facts about an engineering problem and students are asked to analyze some information, diagnose the problem and describe the mathematical solution.
7. seminars held in the Department.

6. Evaluation Method

1. short exams (Quiz).
2. homework assignments and adherence to the specified deadline in the submission of assignments and research required by the student to submit.
3. quarterly and final exams for Theoretical and practical subjects quarterly and final tests are considered for commitment, knowledge and skill achievement.
4. small projects within the lesson.
5. interaction within the lecture and active participation in the classroom demonstrate the student's commitment and responsibility.
6. Reports.

7. Academic Staff

Academic Rank	Specialization		Special Requirements / Skills	Number of Teaching Staff	
	General	Special		Staff	Lecturer
Asst. Prof	Physical	Image Prosing	Head of Department	1	
Asst. Lecture	Electrical Eng.	Power Machine	Rapporteur Department	1	

8. Credits, Grading and GPA

Credits

URUK University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 30 hrs. student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

$$\text{CGPA} = [(1^{\text{st}} \text{ module score} \times \text{ECTS}) + (2^{\text{nd}} \text{ module score} \times \text{ECTS}) + \dots] / 240$$

9. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hr.

No.	Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
1	ATUU113	English Language	18	32	2.00	S	—
2	ATU1111	Computer	48	27	3.00	B	—
3	ATU17013	General Biology	78	97	7.00	C	—
4	ATU17014	Workshops	63	12	3.00	B	—
5	ATU17015	Organic Chemistry	93	82	7.00	C	—
6	ATU17016	Fundamentals of Electricity	108	42	6.00	S	—
7	ATUU111	Human Right and Democracy	33	17	2.00	B	—

Semester 2 | 30 ECTS | 1 ECTS = 25 hr.

No.	Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
1	ATUU112	Arabic Language	18	32	2	B	—
2	ATU17022	Single -Variables Calculus	63	37	4	B	—
3	ATU17023	Biophysics	63	137	8	C	—
4	ATU17024	Physical	78	72	6	C	—
5	ATU17025	Engineering Mechanics- Static	108	17	5	S	—
6	ATU17026	Engineering Drawing	63	62	5	B	—

Module	Module 1
Code	ATUU113
Course/Module Title	English Language
ECTS	2
Semester	1
Class (hr./w)	1
Lect./Lab./Pr./Tutor	1
SSWL (hr./sem.)	18
USSWL (hr./w)	32
Description	
The beginner English language course introduces essential language skills for beginners. It covers basic grammar, vocabulary, listening, speaking, reading, and writing exercises. The course focuses on developing foundational English proficiency and building confidence in using English in everyday situations.	

Module	Module 2
Code	ATU1111
Course/Module Title	Computer
ECTS	3
Semester	1
Class (hr./w)	1
Lect./Lab./Pr. /Tutor	2
SSWL (hr./sem.)	48
USSWL (hr./w)	27
Description	
This module provides a foundation in computer hardware, software, operating systems, and peripherals. It covers understanding operating systems, computer hardware, power options, and utilizing the control panel. Learners will explore software types, Microsoft Office (Word, Excel, Power Point and Outlook), and popular applications like G-Suite (Docs, Sheets, Slides, Gmail, Calendar).	

Module	Module 3
Code	ATU17013
Course/Module Title	General Biology
ECTS	7
Semester	1
Class (hr./w)	3
Lect./Lab./Pr./Tutor	2
SSWL (hr./sem.)	78
USSWL (hr./w)	97
Description	
This course introduces the fundamental concepts of Biology and the study of living organisms in their various forms. It focuses on the structure and development of cells in animals and plants, as well as vital life processes such as growth, movement, reproduction, adaptation, and transformation. The course also examines the relationships between organisms and their surrounding environment, in addition to the connection of Biology with other scientific fields. As a foundational subject, this course provides essential knowledge required for all branches of Biology.	

Module	Module 4
Code	ATU17014
Course/Module Title	Workshops
ECTS	3
Semester	1
Class (hr./w)	0
Lect./Lab./Pr./Tutor	4
SSWL (hr./sem.)	63
USSWL (hr./w)	12
Description	
The Mechanical, Electrical and Electronic Workshop module aims to provide students with hands-on experience and theoretical knowledge in mechanical and electrical engineering. Overall, this module aims to provide students with Practical skills and a theoretical understanding of Mechanical, Electrical and Electronic engineering, enabling them to work with machinery, manipulate metals, and work with electronic components and circuits.	

Module	Module 5
Code	ATU17015
Course/Module Title	Organic Chemistry
ECTS	7
Semester	1
Class (hr./w)	4
Lect./Lab./Pr./Tutor	2
SSWL (hr./sem.)	93
USSWL (hr./w)	87
Description	
This course introduces the fundamental principles of Organic Chemistry, focusing on chemical bonding, molecular structure, and the concepts of acidity and basicity in compounds such as acetylene, water, and ammonia. It covers the nomenclature, preparation, properties, and reactions of important organic compounds including alkanes, alkenes, dienes, alkyl halides, ethers, and alcohols. The course also develops problem-solving skills related to these topics and explains the theory of orientation in organic reactions. In addition, students study important reaction mechanisms such as nitration, sulfonation, halogenation, alkylation, nucleophilic substitution reactions (SN1 and SN2), and elimination reactions (E1 and E2).	

Module	Module 6
Code	ATU17016
Course/Module Title	Fundamentals of Electricity
ECTS	6
Semester	1
Class (hr./w)	4
Lect./Lab./Pr./Tutor	3
SSWL (hr./sem.)	108
USSWL (hr./w)	42
Description	
This course introduces the basic concepts of electrical circuits and develops students' problem-solving skills through the application of circuit analysis techniques. It focuses on understanding fundamental electrical quantities such as voltage, current, and power in different types of circuits. The course also covers essential laws and methods used in circuit analysis, including Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL), mesh analysis, and nodal analysis. As a foundational subject, this course	

provides the essential knowledge required for advanced studies in electrical and electronic engineering circuits.

Module	Module 7
Code	ATUU111
Course/Module Title	Democracy and Human Rights
ECTS	2
Semester	1
Class (hr./w)	2
Lect./Lab./Pr./Tutor	0
SSWL (hr./sem.)	33
USSWL (hr./w)	17
Description	
This course provides a comprehensive understanding of democracy as a way of life, its relationship with freedom, different public freedoms, and the traits, advantages, elements, and forms of democracy. It also covers election procedures and potential manipulation, Iraq's election laws, the development of democracy, constitutional and legal rights, human rights, and fostering a culture of dialogue and acceptance.	

Module	Module 8
Code	ATUU112
Course/Module Title	Arabic Language
ECTS	2
Semester	2
Class (hr./w)	2
Lect./Lab./Pr./Tutor	0
SSWL (hr./sem.)	18
USSWL (hr./w)	32
Description	
The course introduces the basic rules of the Arabic language, which can be used in the academic environment. The module involves teaching the concept of the Arabic language as a tool and means of communication between individuals. Introducing the student to the method of forming sentences using the tools of the Arabic language. Enabling the student to write using correct and basic linguistic and grammatical rules and their scientific applications.	

Module	Module 9
Code	ATU17022
Course/Module Title	Single -Variables Calculus
ECTS	4
Semester	2
Class (hr./w)	3
Lect./Lab./Pr./Tutor	1
SSWL (hr./sem.)	63
USSWL (hr./w)	37
Description	
This course introduces students to the fundamental and advanced principles of calculus, including differentiation, integration, and their various applications in science and engineering. It aims to develop students' analytical and problem-solving skills through solving mathematical exercises and	

practical applications. The course also emphasizes linking mathematical data and information to reach accurate solutions for different problems and applying these concepts in other related subjects.

Module	Module 10
Code	ATU17023
Course/Module Title	Biophysics
ECTS	8
Semester	2
Class (hr./w)	4
Lect./Lab./Pr./Tutor	0
SSWL (hr./sem.)	63
USSWL (hr./w)	137
Description	
This course introduces the interdisciplinary field of Biophysics, which combines principles of physics, biology, chemistry, and computational science to study biological systems at the molecular level. It focuses on the use of chemical and biochemical analysis, spectroscopic techniques, and computational methods to investigate the relationship between the physical properties of molecules and their biological functions. The course explains biological processes through molecular mechanisms, describing how individual molecules interact and function together as microscopic “nanomachines” to perform specific biological activities.	

Module	Module 11
Code	ATU17024
Course/Module Title	Physical
ECTS	6
Semester	2
Class (hr./w)	3
Lect./Lab./Pr./Tutor	2
SSWL (hr./sem.)	78
USSWL (hr./w)	72
Description	
This course provides students with a comprehensive understanding of fundamental physics concepts that form the basis for advanced engineering studies. It emphasizes the application of physics principles in electronic engineering and electronic circuit analysis. The course aims to develop students' analytical and problem-solving skills through practical and theoretical applications of physics. It also builds a strong scientific foundation to support advanced studies in electronic engineering while promoting interdisciplinary understanding and experimental approaches in the design and analysis of electronic circuits.	

Module	Module 12
Code	ATU17025
Course/Module Title	Engineering Mechanics- Static
ECTS	5
Semester	2
Class (hr./w)	5
Lect./Lab./Pr./Tutor	2
SSWL (hr./sem.)	108
USSWL (hr./w)	17
Description	
This course introduces students to the fundamental concepts of Engineering Mechanics with emphasis on statics and force analysis. It reviews the basic principles of scalar and vector mathematics, unit conversion, and their engineering applications. The course covers force systems and their applications in two- and three-dimensional analysis to determine resultants, couples, and moments and their effects on mechanical systems. It also focuses on the conditions of equilibrium for particles and rigid bodies in both two- and three-dimensional systems. In addition, students study structural frames and internal force analysis, providing the foundational knowledge necessary for the design and analysis of engineering components and structures in advanced engineering courses.	

Module	Module 13
Code	ATU17026
Course/Module Title	Engineering Drawing
ECTS	5
Semester	2
Class (hr./w)	0
Lect./Lab./Pr./Tutor	4
SSWL (hr./sem.)	63
USSWL (hr./w)	62
Description	
This course teaches engineering drawing fundamentals and AutoCAD usage, covering menus, toolbars, commands, and dimensioning techniques. Students learn to create accurate drawings following engineering drawing conventions and apply them in AutoCAD. They also explore the valuable utilities offered by AutoCAD for engineering drawing and study orthogonal projection in both traditional geometry and AutoCAD.	

10.Contact

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