Undergraduate Degree Program Catalogue | 2023-2024 |
دليل البرنامج الدراسي

Al-Furat Al-Awsat Technical University

Bachelor of Science Honours (B.Sc. Honours) –
Department: Healthy Physics and Radiation Therapy
بكالوريوس علوم – هندسةتقنيات الفيزياء الصحية والعلاج الاشعاعي

Table of Contents | جدول المحتويات

1. Mission & Vision Statement

Vision Statement

The Department of Department: Healthy Physics and Radiation Therapy Technical Engineering at Al-Furat Al-Awsat Technical University / Engineering Technical College Najaf seeks to be a major tributary in preparing highly qualified specialized cadres that will cover wide sectors of work in the medical, engineering and industrial fields in the public and private sectors

Mission Statement

Preparing distinguished engineers in the fields of Department: Healthy Physics and Radiation Therapy Technical Engineering to help build and develop the community and contribute to providing the community with research and applied scientific studies that address its developmental and developmental issues, as well as striving to strengthen the college's role in building institutions and developing engineering work in order to achieve the concept of comprehensive development within the framework of human values and concepts Finally, building and consolidating cooperation relations with all parties working in the engineering and medical fields, locally and internationally

2. Program Specification

Program code:		**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

The program covers a wide range of subjects at all levels, providing students with a strong foundation in both theoretical knowledge and practical skills. The curriculum is designed to meet the demands of the rapidly evolving medical device industry, ensuring that graduates are well-equipped to excel in their chosen careers.

Throughout the programmed, students will interact with modules covering various core topics. These units include: English for Academic Purposes: This module focuses on developing students' English language proficiency, enabling effective communication and comprehension in academic settings.

Computer Principles: Students will gain a basic understanding of computer systems, including hardware, software, and programming concepts relevant to medical devices.

Calculus (Calculus and Application): This unit introduces students to calculus, with an emphasis on calculus and its applications in solving engineering problems.

DC Electrical Circuits: Students will study direct current (DC) electrical circuits, including circuit analysis techniques, network theories, and circuit components relevant to medical devices.

Physics: This unit provides a grounding in the principles of classical physics, covering topics such as mechanics, thermodynamics and electromagnetism.

Engineering Drawing: Students will develop skills in basic drawing and artistic visualization techniques and the creation of engineering designs.

As students' progress through the programmed, they will delve deeper into advanced topics, thus enabling them to design and innovate medical devices.

In their final year, students will undertake a comprehensive research project, allowing them to apply their knowledge and skills to most medical devices, how they work and what causes them to malfunction. This final project is an opportunity for students to prove their competence and demonstrate their ability to contribute to the advancement of the field.

The Department of Healthy Physics and Radiation Therapy Technical Engineering program combines theoretical education, practical training, and research-oriented projects to provide students with a comprehensive education. Graduates will be prepared to pursue a variety of career paths in hospitals, research centers, laboratories, and more.

3. Program Goals

Due to the rapid scientific and technological progress in the medical device industry, the Department: Healthy Physics and Radiation Therapy Technical Engineering at the Engineering Technical College - Najaf is working on achieving clear strategic goals that will help it establish a prominent position within the academic community. These objectives are evident in the following:

1. Maintaining and improving the quality of curricula through:

• Integration of scientifically and internationally updated study materials in the field of medical devices industry and keep abreast of rapid scientific developments.

• Establishing direct contacts with international companies in the field of manufacturing medical devices all over the world and direct contact with colleges and institutes specialized in the field of manufacturing medical devices.

• Continuous evaluation and curriculum development

•Connecting student projects and research to the needs of the community.

• Increasing students' awareness through hospital field visits, study tours and training

1. Establishing state-of-the-art scientific laboratories equipped with the latest technical devices and equipment in the field of specialization, run by a team of skilled technicians.

2. Providing the best academic environment for faculty members.

3. Ensure the technical development of faculty members through:

• Encouraging participation

• Review and continuous evaluation of its activities.

• Encouraging the initiatives and achievements of faculty members.

1. Knowledge production through:
   - Conducting distinguished theoretical and applied research.
   - Promoting scientific publications and encouraging collaborative work among research groups in various specializations.
   - Striving to increase research funding sources through publications in international engineering journals.
2. Initiatives to reduce administrative routines and facilitate work procedures through educational guidance and enhancing the relationship between students and instructors.
3. Activating and strengthening connections with public government entities and the private sector through:
   - Organizing conferences, seminars, and educational courses.
   - Encouraging consultancy work and providing professional services in various engineering disciplines.

4. Student Learning Outcomes

1.The Department: Healthy Physics and Radiation Therapy Technical Engineering focuses on studying the functioning of the devices, how to operate them, and knowing the causes of their failure.

2. The Department: Healthy Physics and Radiation Therapy Technical Engineering curriculum is designed to provide students with a strong foundation in electronics and knowledge of aviation. They study topics such as computer principles, organic chemistry, biology, physiology, electromagnetic field, thermodynamics that are given to the student from a medical point of view, and engineering mechanics.

1.The department offers a Bachelor of Science degree in Health Physics Engineering and Radiotherapy, which equips students with the skills and knowledge required to excel in this field. Students have the opportunity to specialize in areas such as the design of medical devices as well as their maintenance

2. Through a combination of theoretical learning and practical training, students develop the technical skills needed to operate and maintain the equipment. They also gain a strong understanding of safety regulations, a sense of ethical responsibility, and a dedication to excellence in their work.

3. Upon graduation, the students of the Department of Health Physics Engineering and Radiotherapy are ready to enter the labor market and they possess high skills.

4. In addition, the department supports interdisciplinary collaboration and offers courses that benefit students from other departments.

5. In general, the Department of Health Physics Engineering and Radiotherapy is committed to producing qualified and responsible cadres who can meet the requirements of the development of the medical device industry.Upon graduation, students from the Department of Avionics Electronics Engineering are prepared to enter the workforce as highly skilled engineering technicians. They are equipped to contribute to the development

and advancement of electronic systems in the aviation industry, ensuring the safety and efficiency of aircraft operations.

5. Academic Staff

Academic staff of the department

6. Credits, Grading and GPA

Credits

	Name	Certificate			Mobile Number	
1	Abdullah ali qasim	M.Sc.	lecturer in Communications Eng.		+9647901165670	
2	Haider abbas herees	M.Sc.	Asst. lecturer physics		07800524008	
3	Nawfal mohammed baqer	Ph.D.	Lecturer Healthy Physics			
4	Ali yas khudhair	Ph.D.	Lecturer Healthy Physics		07803486612	
5	Sara abd al kareem mshrif	M.Sc.	Lecturer Department: Healthy Physics		07802592203	
6	Mohyman hyder mahdi	M.Sc.	Lecturer Department: Healthy Physics		07700179628	
7	Sherin Nadhim kadhim	M.Sc.	Lecturer Department: Healthy Physics			
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						

ATU 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 25 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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
NB 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 Grade Point Average (GPA)

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

   GPA of a 4-year B.Sc. degrees:

   GPA = [(1st module score x ECTS) + (2nd module score x ECTS) + ...] / 240

7. Curriculum/Modules

Semester 1 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU17011	English for Academic U	18	32	2.00	S	NO
ATU17012	Computer Principals	48	52	4.00	B	NO
ATU17013	General biology	108	42	6.00	C	NO
ATU17014	Workshop	63	62	5.00	B	NO
ATU17015	Organic chemistry	108	92	8.00	C	NO
ATU17016	Engineering Drawing	59	66	5.00	S	NO
Total		304	346	30.00		

Semester 2 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU17021	Human Right and Democracy	18	32	2.00	B	NO
ATU17022	Multi-variables calculus	63	37	4.00	B	NO
ATU17023	Biophysics	63	137	8.00	C	NO
ATU17024	Physical Optics	78	47	5.00	c	NO
ATU17025	Engineering Mechanics-Static	108	17	5.00	S	NO
ATU17026	Fundamentals of Electricity	108	42	6.00	B	
Total		438	312	30.00		

Semester 3 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU17031	Biochemistry	78	47	5.00	S	No
ATU17032	Fundamentals of Electronics	78	47	5.00	S	No
ATU17033	Nuclear and Radiation Physics	78	122	8.00	C	No
ATU17034	Thermodynamic-ides	48	52	4.00	S	No
ATU17035	Medical physics	78	22	4.00	C	No
ATU17036	advance Mathematics	48	52	4.00	S	No
Total		408	342	30.00		

Semester 4 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU17041	Professional ethics	33	42	3.00	S	No
ATU17042	Human Anatomy	93	32	5.00	C	No
ATU17043	Laser Principles	48	52	4.00	S	No
ATU17044	Atomic physics	78	122	8.00	C	No
ATU17045	Healthy Physics	63	87	6.00	C	No
ATU17046	Geometrical optics	78	22	4.00	S	
Total		393	357	30.00		

Semester 5 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU17051	Aerodynamic -Fundamentals	63	12	3.00	S	NO
ATU17052	logic circuit	93	7	4.00	S	NO
ATU17053	Nuclear medicine	48	152	8.00	C	NO
ATU17054	Physiology	63	87	6.00	C	NO
ATU17055	Biostatistics	48	77	5.00	C	NO
ATU17056	Control Systems	93	7	4.00	S	
Total		408	342	30.00		

Semester 6 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU17061	Aerodynamic -Applied	48	27	3.00	S	NO
ATU17062	Medical instrumentation	78	122	8.00	C	NO
ATU17063	Medical imaging	78	22	4.00	S	NO
ATU17064	Modern Physics	78	47	5.00	C	NO
ATU17065	Biomedical Electronics	78	72	6.00	C	NO
ATU17066	advance medical physics	48	52	4.00	S	
Total		408	342	30.00		

Semester 7 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU17071	Lasers in Medicine	48	2	2.00	C	NO
ATU17072	Biomedical sensors	78	122	8.00	C	NO
ATU17073	Physics of Radiotherapy	63	62	5.00	C	NO
ATU17074	Spectroscopy	63	12	3.00	C	NO
ATU17075	Optoelectronics	48	152	8.00	C	NO
ATU17076	Medical Image Analysis	93	7	4.00	S	NO
Total		393	357	30.00		

Semester 8 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU17081	advance Medical instrumentation	93	107	8.00	C	NO
ATU17082	Cell biology	48	127	7.00	C	NO
ATU17083	Quantum mechanics	48	2	2.00	C	NO
ATU17084	Engineering of Radiation Instrument	78	72	6.00	C	NO
ATU17085	Radio physics	63	37	4.00	C	NO
ATU17086	Final Project	63	12	3.00	C	
Total		393	357	30.00		

Total for all Semesters		3245	2755	240.0		

8. Contact

Program Manager:

Abdullah Ali Qasim | lecturer

Email:

alzubydea@atu.edu.iq

Mobile no.:

07901165670

ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي