

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



<h1>University of Technology-Iraq</h1>	
<p>Bachelor's level (First cycle) Honors Bachelor's degree in Applied Physics</p>	
<p>بكالوريوس العلوم التطبيقية - اختصاص الفيزياء التطبيقية</p>	



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1. Mission & Vision Statement

Vision Statement

The applied Physics academic staff of the Applied Physics Branch at the University of Technology-Iraq believe that students come to understand the discipline of applied Physics through a combination of coursework, laboratory experiences, research, and fieldwork. The combination of instructional methods leads students to a balanced understanding of the scientific methods used by physicists to make observations, develop insights and create theories about physical phenomena and devices. Small class sizes within the applied Physics program foster a close working relationship between academic staff and students in an informal and nurturing atmosphere.

Mission Statement

The applied Physics academic staff pursues a multifaceted charge at the University of Technology-Iraq. The Program seeks to provide all applied Physics students with fundamental knowledge of applied Physics, as well as a deeper understanding of a selected focus area within the applied physical sciences. The curriculum and advising have been designed to prepare graduates for their professional future, whether they choose to work as field physicists specializing in applied Physics or industrial fields or to pursue advanced degrees in the applied Physics sciences or medical Physics sciences. The applied Physics program also provides the necessary fundamental knowledge of the applied Physics sciences to support the electrical engineering degree, the medical studies degree, and the materials science and engineering studies degree. In addition, applied Physics courses provide a key laboratory science experience for those students seeking to complete the general education requirements.

2. Program Specification

Programme code:	BSc-PHY	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

Applied Physics is a wonderfully wide-ranging subject, and the University of Technology-Iraq, with one of Iraq's largest and most diverse applied Physics teaching groups, is well equipped to deliver. The emphasis of the programme is the whole phenomena to which everything is related, be it the atoms and molecules that form

materials and their interaction with the surrounding environment. The degree is popular - for some, it's the breadth of the subject that appeals, for others it's a path to specialization. All students have the opportunity to transfer onto our specialist degrees in solid-state Physics, optoelectronic Physics, medical Physics, nanotechnology, and thin film Physics at the end of the first year.

Level 1 exposes students to the fundamentals of applied Physics, suitable for progression to all programmes within the applied Physics programme group. Programme-specific core topics are covered at Level 2 preparing for research-led subject specialist modules at Levels 3 and 4. An Applied Physics graduate from the University of Technology-Iraq is therefore trained to appreciate how research informs teaching, according to the University and School Mission statements.

At Levels 2, 3, and 4 students will have their module credits with the proviso a range of modules are selected that reflect the complexity of applied Physics, through the applications of different concepts and technologies to populations to ensure the breadth of knowledge expected of a graduate with an applied Physics degree. This allows students to develop their own wide-ranging interests in applied Physics. Decisions on what to study are made with input from personal tutors.

The research ethos is developed and fostered from the start via practical, which are either embedded in lecture modules or taught in dedicated practical modules, research seminars and tutorials. There is a compulsory field course in Level 1, which students must pass in order to progress into Level 2, and optional field courses in Levels 2, 3 and 4. At Level 4 all students carry out an independent research project.

Academic tutorials are held at Levels 1 and 2 with the same tutor, who is also the personal tutor, providing continuity and progressive guidance. Level 1 and 2 tutorials include a number of workshops to teach skills, e.g. library use and presentation skills, followed by assessed exercises, e.g. essays and talks, as opportunities to practice these skills in a subject-specific context.

International years and Industrial placements are also offered and individual needs are discussed with the appropriate tutor and accommodated wherever possible.

3. Program Goals

1. To provide a comprehensive education in applied Physics that stresses scientific reasoning and problem solving across the spectrum of disciplines within applied Physics
2. To prepare students for a wide variety of post-baccalaureate paths, including graduate school, professional training programs, or entry level jobs in any area of applied Physics
3. To provide extensive hands-on training in electronic technology, statistical analysis, laboratory skills, and field techniques
4. To provide thorough training in written and oral communication of scientific information

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5. To enrich students with opportunities for alternative education in the area of applied Physics through undergraduate research, internships, and study-abroad

4. Student Learning Outcomes

Applied Physics involves the utilization of Physics principles to address scientific and engineering challenges. It serves as a link between Physics and engineering, acting as a connection that combines the two fields. The term "applied" distinguishes it from "pure" Physics, taking into account various factors such as researchers' motivation, attitude, and the impact of their work on technology or science. Although it is firmly grounded in the fundamental truths and basic concepts of the physical sciences, applied Physics focuses on employing scientific principles in practical devices and systems, as well as applying Physics in other scientific fields and advanced technology. Graduates obtain information on the historical, technical, and social aspects of applied Physics and utilize basic knowledge toward realizing broader concepts. The Branch offers a Bachelor of Science in Applied Physics with a concentration in General Applied Physics; Solid-State Physics; Medical Physics; Nanotechnology Physics and a minor in Secondary Education that leads to a Public Instruction License. Additionally, the Branch offers courses to a large number of students from other departments and supports pre-professional programs. The Applied Physics curriculum and experiences are designed to prepare students, in part, for entry into professional industrial and medical programs, graduate studies, technical careers, and education

Outcome 1

Identification of Complex Relationships

Graduates will be able to handle and explain the various applied physical phenomena and devices and explain how they interact and/or solve the related engineering and technology issues.

Outcome 2

Oral and Written Communication

Graduates will be able to formally communicate the results of applied physical investigations using both oral and written communication skills.

Outcome 3

Laboratory and Field Studies

Graduates will be able to perform laboratory experiments and field studies, by using scientific equipment and computer technology while observing appropriate safety protocols.

Outcome 4

Scientific Knowledge

Graduates will be able to demonstrate a balanced concept of how scientific knowledge develops, including the historical development of foundational theories and laws and the nature of science.

Outcome 5

Data Analyses

Graduates will be able to demonstrate scientific quantitative skills, such as the ability to conduct simple data analyses.

Outcome 6

Critical Thinking

Graduates will be able to use critical thinking and problem-solving skills to develop a research project and/or paper.

5. Academic Staff

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6. Credits, Grading and GPA

Credits

The University of Technology-Iraq 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 workloads, 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)

- 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 4-year B.Sc. degrees:

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

7. Curriculum/Modules

Semester 1 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
CLME111	Classical Mechanics I	93	107	8.00	C	
ELMA112	ELecturertricity and Magnetism I	93	107	8.00	C	
MATH113	Mathematics I	63	112	7.00	B	

WOTR114	Workshops and training	45	5	2.00	B	
CHEM115	Chemistry	63	12	3.00	B	
HURI116	Human Rights	31	19	2.00	S	

Semester 2 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
CLME121	Classical Mechanics II	93	107	8.00	C	
ELMA122	ELecturertricity and Magnetism II	93	107	8.00	C	
MATH123	Mathematics II	63	112	7.00	B	
WOTR114	Workshops and training	45	5	2.00	B	
COSC125	Computer Science	63	12	3.00	B	
ENLA126	English language	33	17	2.00	S	

Semester 3 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request

Semester 4 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request

Semester 5 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request

Semester 6 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request

Semester 7 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request

Semester 8 | 30 ECTS

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request

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