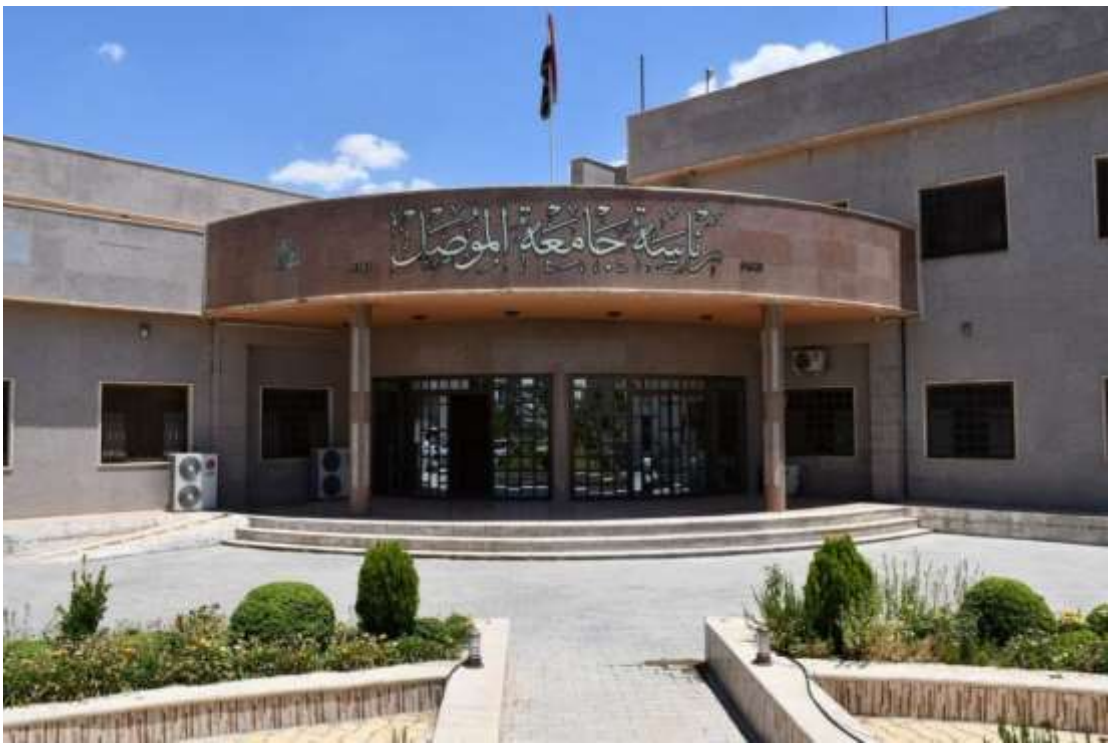
Program Catalogue | 2024-2025 |

University of Mosul
College of Science
Physics Department

First Cycle – Bachelor's degree (B.Sc.) – Physics



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1 . Mission & Vision Statement

- ***Vision Statement***

We seek for the Physics Department to be a pioneer in education and scientific research, contributing to achieving sustainable development and developing knowledge and physical applications that meet the needs of society, and for graduates of the Physics Department to be leaders and influencers in their fields, committed to the highest standards of professional and ethical responsibility, and keeping pace with the changing requirements of the labour market.

- ***Mission Statement***

The Physics Department at the College of Science seeks to provide high-quality education in the fields of basic and applied physics, and to promote pioneering scientific research that contributes to the advancement of scientific knowledge and solving societal problems. The department also seeks to prepare a generation of scientists capable of leading innovation in various fields of science, while adhering to the highest academic, ethical and professional standards, which qualifies them to contribute effectively to achieving sustainable development, and to provide the labour

market with physical competencies capable of leadership and innovation in various scientific and technical sectors.

2. Program Specification

Programme code:	BS-Phy.	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

Preparing qualified graduates with knowledge and creativity in the field of physics, who are able to interact with the requirements of the age and technology, and contribute to building Iraqi society on sound scientific and ethical foundations.

3. Program Objectives

The Department of Physics seeks to achieve the following objectives:

1. Developing the ability to innovate: Students will be able to analyze and formulate complex physical problems, using a precise scientific methodology, and apply the appropriate physical principles and mathematical models to solve them, while documenting the solution steps and results.

2. Linking theory to application and providing institutions with qualified graduates: The Department of Physics seeks to enhance its partnerships with industrial and research institutions to provide practical training for its students, enabling them to gain practical research and technical experience and meet the needs of the labor market

3. Improving the quality of scientific research and developing graduate programs: The Department of Physics aims to prepare a generation of physicist researchers by providing students with advanced research knowledge and skills. It focuses in particular on developing specialized graduate programs in future physics fields

4. Enhancing creative communication skills and promoting environmental sustainability: The Department of Physics focuses on developing students' creative communication skills through specialized courses, with the aim of enabling them to become ambassadors of science and knowledge

5. Enhancing ethical awareness and preparing a generation of scientists committed to the highest standards: The Department of Physics attaches great importance to enhancing students' ethical awareness, considering scientific ethics as the basis for graduating responsible scientists. To achieve this, the department organizes workshops on scientific ethics with the aim of instilling commitment to ethical and professional standards among students, and enabling them to contribute effectively and responsibly to serving science and society.

6. Encouraging effective teamwork and promoting international cooperation: The Physics Department focuses on instilling the value of teamwork in students from the early stages through courses that include group projects aimed at developing cooperation skills and exchanging experiences among students. The Physics Department is keen to build bridges of international cooperation with leading universities and research institutions.

7. Integrating modern technology: The Physics Department integrates artificial intelligence and nanotechnology into its curricula to keep pace with scientific developments, with the aim of preparing theoretically and practically qualified graduates who are able to contribute to research and the labour market.

4. Student Learning Outcomes

1. Ability to identify scientific problems: The student identifies, analyses, and they formulate complex physical problems in a precise scientific manner by applying physical principles and using experimental and theoretical methods to understand and explain physical phenomena.

2. Application of scientific knowledge: Employs physical knowledge in addressing problems in the fields of engineering, medicine, technology, and energy to provide sustainable solutions. It also contributes to developing innovative scientific solutions that meet the needs of society and the labour market.

3. Implementation of scientific tests: Designs accurate scientific experiments in line with scientific research standards using modern devices and software to collect and analyse physical data and interpret the results extracted from the experiments and compares them with approved physical theories.

4. Effective communication skills: Presents scientific presentations in a clear and convincing manner to an academic or industrial audience, and they write scientific reports and research articles according to approved academic standards.

5. Ethical and professional awareness: Commits to ethical practices in physical research and applications, takes into account environmental and social issues and labour market requirements when applying physical solutions, and contributes to spreading scientific awareness and social responsibility in society.

6. Teamwork: Participates effectively in scientific research and technological development teams, planning and implementing research projects in cooperation with colleagues to ensure achievement of objectives, identifying potential risks during laboratory or applied work, and taking appropriate measures to reduce them.

7. Keeping up with technological developments: Follows up on developments in the field of modern physical technologies such as artificial intelligence and computer modelling. Uses modern software and technological tools to analyze data and conduct simulations. It seeks to continuously develop his skills through self-learning and participation in scientific courses and workshops.

5. Academic Staff

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6. Credits, Grading and GPA

Credits

Mosul 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 25 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:				
The Decimal number placed 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:

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

5. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY1101	Mechanics and properties of matter I	108	92	8.00	C	
PHY1102	Electricity	108	92	8.00	C	
Sci-101	Mathematics I	33	17	2.00	B	
PHY1103	General Astronomy	93	107	8.00	C	
UOM104	Democracy &Human Right	33	17	2.00	B	
UOM101	Arabic Language	41	9	2.00	B	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY1214	Mechanics and properties of matter II	108	92	8.00	C	PHY1101
PHY1215	Magnetism	108	92	8.00	C	PHY1102
PHY1217	Mathematics 2	48	52	4.00	S	Sci-101
UOM103	Computers I	48	27	3.00	B	
PHY1206	General Chemistry	78	47	5.00	S	
UOM102	English Language	33	17	2.00	B	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY2308	Modern Physics I	79	71	6.00	C	
PHY2309	Heat and Thermodynamic	79	71	6.00	C	
PHY23010	Analytical Mechanics I	63	62	5.00	C	
PHY23011	Analog Electronics	64	61	5.00	C	
UOM2050	Baath Crimes	33	17	2.00	B	
UOM2050	English Language 2	33	17	2.00	B	
PHY23112	Mathematics 3	48	52	4.00	C	PHY1217

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY2032	Computers 2	63	12	3.00	B	
PHY24114	Modern Physics II	78	72	6.00	C	PHY2308
PHY24015	Thermodynamic and Statistical	78	72	6.00	C	
PHY24116	Analytical Mechanics II	63	62	5.00	C	PHY23010
PHY24017	Digital Electronics	78	47	5.00	C	
PHY24018	sound and wave motion	48	27	3.00	C	
UOM2012	Arabic Language 2	33	17	2.00	B	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY35019	Geometrical Optics	79	71	6.00	C	
PHY35020	Laser Physics I	79	71	6.00	C	
PHY35021	Quantum Mechanics I	48	52	4.00	C	
PHY35022	Material Physics I	64	61	5.00	C	
PHY35023	Mathematics 4	48	77	5.00	C	PHY24113
PHY35024	Spectra	63	37	4.00	C	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY36025	Physical Optics	94	81	7.00	C	
PHY36126	Laser Physics II	79	71	6.00	C	PHY35020
PHY36127	Quantum Mechanics II	48	52	4.00	C	PHY35121
PHY36128	Material Physics II	94	81	7.00	C	PHY35022
PHY36029	Molecular Physics	48	27	3.00	C	
PHY36030	Nano physics	48	27	3.00	C	

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY47031	Nuclaear Physics I	94	81	7.00	C	
PHY47032	Solid State Physics I	94	81	7.00	C	
PHY47033	Electromagnatics Theory I	49	51	4.00	C	
PHY47034	Research Methodology	48	52	4.00	C	
PHY47035	Elective1 (solar energy+Nuclear reactors)	48	52	4.00	E	
PHY47036	Bio-physics	47	53	4.00	C	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY48137	Nuclear Physics II	94	81	7.00	C	PHY47031
PHY48138	Solid State Physics II	94	81	7.00	C	PHY47132
PHY48139	Electromagnetics Theory II	49	51	4.00	C	PHY47033
PHY48040	plasma physics	48	52	4.00	C	
PHY48041	Research project	63	37	4.00	C	
PHY48042	Elective 2 (Special Relativity +Medical physics)	48	52	4.00	E	

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