University of Anabr

جامعة الانبار

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

بكالوريوس علوم - فيزياء

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1. About Department

The Physics Department was established in the faculty of Science in 1989. The study period in the department is four years. The department grants a bachelor's degree in general physics after the student has completed a systematic scientific preparation that qualifies him/her to keep pace with technical progress in the field of scientific research and to provide service to the public and private sectors.

The department includes laboratories for postgraduate and undergraduate such as Nano thin films, plasma ,advance materials as well as for radiation measurements that contain devices and equipment within international standards. Dozens of scientific research have been published in international journals with an impact factor and indexed in the Scopus classification.

The department included the following degrees: –

- **Bachelor's degree:**

This includes four stages; each stage includes two semesters meaning for the students to be graduated, they must have completed eight semesters. These includes BSc in general physics.

- **Master's degree**

It includes two stages, namely the preparatory year, and it is divided into two semesters (two courses), in the first semester, basic courses are given while in the second semester basic courses together with optional courses are given that are mostly specialized. The second stage includes conducting a scientific research, whether in the theoretical or practical side, and continues for a period of one calendar year, after which the student defend his research work (thesis) through a committee of specialists in order to grant him/her a higher degree that qualifies him/her to practice his work in that specialization.

- **PhD degree**

It includes two stages. The first stag is the preparatory stage of the PhD course, and this is divided into two semesters, in the first semester, advanced courses in physics are given while in the second semester advanced specialized courses together with optional courses in specified fields of physics (e.g. Nanoscience, medical physics, radiation physics…etc). The second stage includes conducting a scientific research spending at least two years. After completing the thesis, the student submits his these for final viva.

2. Mission & Vision Statement

- **Vision Statement**

The Department of Physics seeks to establish and develop scientific knowledge in the community and upgrading it by preparing specialized human cadres with high efficiency to use modern technology for use in the fields of scientific research and capable of serving society and science and providing the student with knowledge in the fields of physics because of its expansion and great connection with the rest of other sciences, whether in natural and industrial fields, and advanced research that have an effective impact on the development of scientific knowledge and the service of the labor market.

- **Mission Statement**

The mission of the department is to prepare students professionally and scientifically through a scientific program that focuses on the student's need for educational and learning tools and to work to meet one of the most important objectives upon which the faculty was founded, which is to qualify the student academically and scientifically in a way that is fully consistent with the requirements of the progress in science regarding basic sciences, which represent the basic of the rest of the sciences and the basis on which international scientific and knowledge development depends.

The basic tasks of the Physics Department are based on three essentials basics:

• The educational process: providing an excellent educational environment for students and equipping them with science to develop their intellectual level and abilities and make them responsible in society, especially with regard to scientific and applied matters.

• Scientific research: revitalizing scientific research through the participation of faculty members and students in conducting physics research and disseminating knowledge to contribute to the development of the local community as required by the labor market.

• Community service: Consolidating relations with state departments benefiting from their specializations by providing basic and applied research, as well as holding seminars and scientific lectures inside and outside the department, especially medical, agricultural, educational and environmental institutions.

3. Program Specification

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

Physics is one of the most important and leading science that has a wide range of applications in natural life that is a key in serving the community as a whole and individuals in specific. The physics also has its essential role in prompt development of recent technology.

Level 1 offers students the fundamentals of physics, suitable for progression in the all programs within the physics fields. Specific physics related core topics are covered at Level 2 preparing for research-led subject specialist modules at Levels 3 and 4. At Levels 3 and 4, students are free to select four modules with a range of modules that reflect cutting edge subjects. The research ability is developed and fostered from the start via practical coursework, which are either embedded in lecture modules or taught in dedicated practical modules (research seminars and tutorials). There is a compulsory physics course in Level 1, which students must pass in order to progress into Level 2. At Level 4 all students carry out an independent research project.

4. Program Goals

1. To provide a comprehensive education in physics that stresses scientific reasoning and problem solving across the spectrum of disciplines within 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 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

5. Student Learning Outcomes

The Department of Physics has been working on preparing specialized staffs in physics and scientific research as well as preparing professional and educational staffs for the different state directorates. One of the most important aims of the department in the Faculty of Sciences is working on qualifying the students academically and scientifically to completely cope with the modernized technology in physics. The department is also looking forward to developing the research skills of the students and get them acquainted with technology and programs throughout their research.

A student completing a major in Physics shall demonstrate the ability to:

1. Demonstrate conceptual understanding of fundamental physics principles
2. Communicate physics reasoning in oral and in written form
3. Solve physics problems using qualitative and quantitative reasoning including sophisticated mathematical techniques
4. Conduct independent research or work successfully in a technical position.

6. Academic Staff

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7. Credits, Grading and GPA

- **Credits**

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 follow

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:

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

8. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs (general physics)

Semester	No.	Module Code	Module Name in English	Language	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type
One	1	PHY-111	Mechanics I	English	94	81	175	7.00	C
	2	PHY-112	Electricity	English	79	96	175	7.00	C
	3	PHY-113	Mathematics I	English	63	62	125	5.00	B
	4	SCI-101	Computer Programming I	English	64	36	100	4.00	B
	5	UNI-103	Human Rights and democracy	Arabic	48	27	75	3.00	S
	6	UNI-102	Arabic Language	Arabic	48	52	100	4.00	S
				Total	396	354	750	30.00	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs (general physics)

Semester	No.	Module Code	Module Name in English	Language	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type
Two	1	PHY-121	Mechanics II	English	94	81	175	7.00	C
	2	PHY-122	Magnetism	English	94	81	175	7.00	C
	3	PHY-123	Mathematics II	English	48	77	125	5.00	B
	4	PHY-124	Computer Programming II	English	49	51	100	4.00	B
	5	PHY-125	General Astronomy	English	48	27	75	3.00	B
	6	UNI-101	English Language	English	63	37	100	4.00	S
				Total	396	354	750	30.00	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs (general physics)

Semester	No.	Module Code	Module Name in English	Language	SSWL	USSWL	SWL	ECTS	Module Type
					hr/sem	hr/sem	hr/sem		
Three	1	PHY-211	Modren Physics I	English	79	71	150	6.00	C
	2	PHY-212	Heat and Thermodynamic	English	79	71	150	6.00	C
	3	PHY-213	Analytical Mechanics I	English	48	52	100	4.00	C
	4	PHY-214	Analog Electronics	English	79	71	150	6.00	C
	5	PHY-215	MathematicsIII	English	48	52	100	4.00	B
	6	PHY-216	Numerical Analytic	English	63	37	100	4.00	B
				Total	396	354	750	30.00	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs (general physics)

Semester	No.	Module Code	Module Name in English	Language	SSWL	USSWL	SWL	ECTS	Module Type
					hr/sem	hr/sem	hr/sem		
Four	1	PHY-221	Modren Physics II	English	48	71	100	4.00	C
	2	PHY-222	Heat and Thermodynamic	English	79	71	150	6.00	C
	3	PHY-223	Analytical Mechanics II	English	63	37	100	4.00	C
	4	PHY-224	Digital Electronics	English	79	71	150	6.00	C
	5	PHY-225	MathematicsIIII	English	48	52	100	4.00	B
	6	PHY-226	Geometrical Optics	English	79	52	150	6.00	C
				Total	396	354	750	30.00	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs (general physics)

Semester	No.	Module Code	Module Name in English	Language	SSWL	USSWL	SWL	ECTS	Module Type
					hr/sem	hr/sem	hr/sem		
Five	1	PHY-311	Physical Optics	English	79	71	150	6.00	C
	2	PHY-312	Laser Physics I	English	79	71	150	6.00	C
	3	PHY-313	Quantum Mechanics II	English	63	37	100	4.00	C
	4	PHY-314	Material Physics I	English	79	71	150	4.00	C
	5	PHY-315	Semiconductor	English	79	71	150	5.00	C
	6	PHY-316	Mathematical Physics I	English	48	52	50	5.00	C
				Total	427	373	750	30.00	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs (general physics)

Semester	No.	Module Code	Module Name in English	Language	SSWL	USSWL	SWL	ECTS	Module Type
					hr/sem	hr/sem	hr/sem		
Six	1	PHY-321	sound and wave motion	English	79	71	100	4.00	C
	2	PHY-322	Laser applications	English	79	71	150	6.00	C
	3	PHY-323	Quantum Mechanics II	English	63	37	125	5.00	C
	4	PHY-324	statistical mechanics I	English	79	71	150	6.00	C
	5	PHY-325	Mathematical Physics II	English	63	37	125	5.00	C
	6	PHY-326	Modeling and simulation	English	33	67	100	4.00	E
				Total	396	354	750	30.00	

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs (general physics)

Semester	No.	Module Code	Module Name in English	Language	SSWL	USSWL	SWL	ECTS	Module Type
						hr/sem	hr/sem	hr/sem	
Seven	1	PHY-411	Nuclaear Physics I	English	94	81	175	7.00	C
	2	PHY-412	Solid State Physics I	English	94	81	175	7.00	C
	3	PHY-413	Electromagnatics Theory I	English	63	37	100	4.00	C
	4	PHY-414	Nanoscience I	English	63	37	100	4.00	B
	5	PHY-415	Nuclear spectrum	English	48	52	100	4.00	E
	6	PHY-416	statistical mechanics II	English	32	68	100	4.00	C
				Total	394	356	750	30.0	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs (general physics)

Semester	No.	Module Code	Module Name in English	Language	SSWL	USSWL	SWL	ECTS	Module Type
						hr/sem	hr/sem	hr/sem	
Eight	1	PHY-421	Nuclaear Physics II	English	79	96	175	7.00	C
	2	PHY-422	Solid State Physics II	English	79	96	175	7.00	C
	3	PHY-423	Electromagnatics Theory II	English	63	37	100	4.00	C
	4	PHY-424	medical Physics	English	63	37	100	4.00	C
	5	PHY-425	Particles Physics	English	63	37	100	4.00	C
	6	PHY-426	Research project	English	48	52	100	4.00	E
				Total	395	355	750	30.0	

9. Contact

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