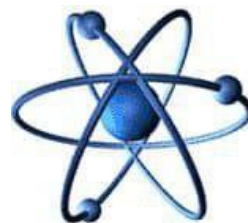


## Department of Physics

قسم الفيزياء



*Bachelor's degree (B.Sc.) – physics and medical physics*

بكالوريوس الفيزياء والفيزياء الطبية



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### 1. Mission & Vision Statement

#### *Vision Statement*

The Department of Physics in the College of Science for Girls seeks to achieve excellence in the field of teaching physics and medical physics through the application of quality standards in a climate characterized by independence and stimulation of ambition and creativity, thus contributing to the preparation of female graduates who produce knowledge and have a positive role in the process of development and comprehensive construction and lead.

#### *Mission Statement*

The Physics Science Department at the College of Science for Women supports the mission of the University of Baghdad through its teaching and research. Preparing female graduates with a solid scientific level, extensive scientific experience, and personal capabilities that qualify them to keep pace with scientific and technological development and to engage in various fields of work.

### 2. Program Specification

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

Physics Science is a wonderfully wide-ranging subject and is well-equipped to deliver, This is through the adoption of the academic system and curricula that achieve the sober scientific level that distinguishes international institutions.

**Level 1** exposes students to the fundamentals of Physics science. Programmed-specific core topics are covered at **Level 2** preparing for research-led subject specialist modules at **Levels 3 and 4**. In Levels **1** and **2** the student learns about the basics of Physics, as well as the basics of programming language and logical thinking, as well as the basics of mathematics so that the student is prepared for more specialized modules in the following levels .At Levels **3** and **4**, students are free to choose the specialization they want. This allows students to develop their own wide-ranging interests in different aspects of physical science .

The research ethos is developed and fostered from the start via practicals, either embedded in lecture modules or taught in dedicated practical modules, research seminars, and tutorials. At Level 4, all students carry out an independent research project, Which may be theoretical or applied in various fields such as solar cells or nanomaterials and their applications or in the field of medical physics and other various physics applications required in the labor market

### **3. Program Objectives**

1. Adopting the academic system and curricula that achieve the sober scientific level that distinguishes international institutions.
2. Upgrading the level of postgraduate studies and scientific research to address the challenges and contribute to the development of developmental, environmental, economic, and social programs.
3. Adopting modern learning methods, means, and resources.
4. Implementing educational programs that support self-confidence, and developmental abilities, and stimulate ambition to achieve success in personal and academic life.
5. Organizing extra-curricular activities that contribute to the development of the student's personality, promoting virtuous moral principles, developing a sense of responsibility, and contributing to community service.

### **4. Student Learning Outcomes**

A student completing a major in Physics shall demonstrate the ability to: Demonstrate a conceptual understanding of fundamental physics principles Communicate physics reasoning in oral and in written form, Solve physics problems using qualitative and quantitative reasoning including sophisticated mathematical techniques, and, Conduct independent research or work successfully in a technical position.

#### **Outcome 1**

Identification of Complex Relationships

Graduates will be able to explain the structure and properties of the prepared materials and explain

how to apply them in the different labor markets.

### **Outcome 2**

Oral and Written Communication

Graduates will be able to formally communicate the results of physics 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**

Southern Baghdad university/Collage of Science for Women/ Department of Physics is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 25 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
<b>Fail Group (0 – 49)</b>	FX – Fail	راسب قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
<b>Note:</b>				
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)**

- 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:

$$\text{CGPA} = [ (1^{\text{st}} \text{ module score} \times \text{ECTS}) + (2^{\text{nd}} \text{ module score} \times \text{ECTS}) + \dots ] / 201$$

## **7. Curriculum/Modules**

### **1. Physics**

**Year 1 - Semester 1 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY 1101	Mechanics I	4	94	200	8.00	
PHY 1102	Electricity	4	94	200	8.00	
COS-1103	Mathematics I	3	63	125	5.00	
UOB-104	Human Rights and democracy	3	33	50	2.00	
COS-1105	General Chemistry	4	64	125	5.00	
UOB-102	English Language I	3	33	50	2.00	

**Year 1–Semester 2 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY 1207	Mechanics II	94	81	7.00	C	
PHY 1208	Magnetism	94	81	7.00	C	
COS-1210	Mathematics II	63	62	5.00	C	
UOB103	Computer 1	48	27	3.00	B	
PHY 1211	Geometric Optics	94	56	6.00	B	
UOB101	Arabic Language	33	17	2.00	S	

**Year 2 - Semester 3 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY 2313	Modern Physics I	94	56	6.00	C	
PHY 2314	Heat and Thermodynamic	94	56	6.00	C	
PHY 2315	Analytical Mechanic II	63	87	6.00	C	
PHY 2316	Analog Electronics	94	56	6.00	C	
PHY-2317	Mathematics III (Differential)	63	12	3.00	B	
UOB207	Computer 2	48	27	3.00	B	

**Year 2 - Semester 4 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY 2419	Modern Physics II	94	56	6.00	C	
PHY 2420	Thermodynamic and Statistical	94	56	6.00	C	
PHY 2421	Analytical Mechanic II	63	62	5.00	C	
PHY 2422	Digital Electronics	94	31	5.00	C	
COS 2423	Mathematics IIII (Complex analysis)	63	37	4.00	B	
UOB 206	English Language II	33	17	2.00	S	

**Year3 - Semester 5 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY-3526	physical optics	63	62	5.00	C	
PHY-3527	Laser physics	94	56	6.00	C	
PHY-3528	Quantum Mechanics I	63	62	5.00	C	
PHY-3529	Material Physics I	94	56	6.00	C	
UOB-309	Research Methodology	18	7	1.00	C	
PHY-3531	Optional I	63	87	5.00	E	



**Year3 - Semester 6 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY-3632	Mathematical Physics	63	87	6.00	C	
PHY-3633	Laser Physics II	94	56	6.00	C	
PHY-3634	Quantum Mechanics II	63	37	4.00	C	
PHY-3635	Material Physics II	94	56	6.00	S	
PHY-3636	Molecular Physics	48	2	2.00	C	
PHY-3637	Optional II	63	87	5.00	C	

**Year 4 - Semester 7 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY-4738	Nuclear Physics I	94	56	6.00	C	
PHY-4739	Solid State Physics I	94	31	5.00	C	
PHY-4740	Electromagnetic Theory I	63	62	5.00	C	
PHY-4741	Nano Science	63	62	5.00	B	
PHY-4742	Option III	63	62	5.00	E	
PHY-4743	Research Project I	63	37	4.00	C	

**Year 4 - Semester 8 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY-4844	Nuclear Physics II	94	56	6.00	C	
PHY-4845	Solid State Physics II	94	56	6.00	C	
PHY-4846	Electromagnetic Theory II	63	37	4.00	C	
PHY-4847	Plasma Physics	63	62	5.00	C	
PHY-4848	Option IIII	63	62	5.00	C	
PHY-4849	Research Project II	63	37	4.00	E	

## 1. Medical Physics

Year 1 - Semester 1 | 25 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY 1101	Mechanics I	94	106	8.00	C	
PHY 1102	Electricity	94	106	8.00	C	
COS-1103	Mathematics I	63	62	5.00	B	
UOB-104	Human Rights and democracy	33	17	2.00	S	
COS-1105	General Chemistry	64	61	5.00	B	
UOB-102	English Language I	33	17	2.00	S	

Year 1-Semester 2 | 25 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY 1207	Mechanics II	94	81	7.00	C	
PHY 1208	Magnetism	94	81	7.00	C	
COS-1210	Mathematics II	63	62	5.00	C	
UOB103	Computer 1	48	27	3.00	B	
PHY 1211	Geometric Optics	94	56	6.00	B	
UOB-101	Arabic Language	33	17	2.00	S	

**Year 2 - Semester 3 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY 2313	Modern Physics I	94	56	6.00	C	
PHY 2314	Heat and Thermodynamic	94	56	6.00	C	
PHY 2315	Analytical Mechanic I	63	87	6.00	C	
PHY 2316	Analog Electronics	94	56	6.00	C	
PHY-2317	Mathematics III (Differential)	63	12	3.00	B	
UOB-207	Computer 2	48	27	3.00	B	

**Year 2 - Semester 4 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
PHY 2419	Modern Physics II	94	56	6.00	C	
PHY 2420	Thermodynamic and Statistical	94	56	6.00	C	
PHY 2421	Analytical Mechanic II	63	62	5.00	C	
PHY 2422	Digital Electronics	94	31	5.00	C	
COS 2423	Mathematics IIII (Complex analysis)	63	37	4.00	B	
UOB 206	English Language II	33	17	2.00	S	
UOB-205	Baath Regime Crimes in iraq	33	17	2.00	S	

**Year3 - Semester 5 | 25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MPH-3526	Physiology and anatomy	94	31	5.00	C	
MPH-3527	Medical Physics I	94	31	5.00	C	
MPH-3528	Medical imaging I	94	31	5.00	C	
MPH-3529	physical optics	94	56	6.00	C	
MPH-3530	Laser Basics	94	31	5.00	C	
MPH-3531	Optional 1	63	37	4.00	E	

**Year3 - Semester 6 |25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MPH-3632	Medical imaging II	94	31	5.00	C	
MPH-3633	Medical physics II	94	56	6.00	C	
MPH-3634	Laser in Medicine	94	56	6.00	C	
MPH-3635	Quantum Mechanics in medicine	63	87	6.00	S	
UOB-309	Research Methodology	18	7	1.00	C	
MPH-3637	Optional II	63	87	6.00	E	

**Year 4 - Semester 7 |25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MPH-4738	Medical Instrumentation I	94	56	6.00	C	
MPH-4739	Solid State Physics	94	31	5.00	C	
MPH-4740	Nuclear physics	94	56	6.00	C	
MPH-4741	Mathematical physics	63	62	5.00	B	
MPH-4742	Option IIII	63	62	5.00	E	
MPH-4743	Research Project I	63	12	3.00	C	

**Year 4 - Semester 8 |25 ECTS | 1 ECTS = 25 hrs**

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MPH-4844	Nanoscience and medicine	63	62	5.00	C	
MPH-4845	Physics of Radiotherapy I	64	86	6.00	C	
MPH-4846	Research Project II	63	12	3.00	C	
MPH-4847	Biomaterials	94	56	6.00	C	
MPH-4848	Electromagnetic Theory	63	62	5.00	C	
MPH-4849	Option IIII	63	62	5.00	E	

## 8. Contact

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