Ministry of Higher Education and Scientific Research
University of Babylon
College of Education for Pure Sciences
Department of Physics

وزارة التعليم العالي والبحث العلمي
جامعة بابل
كلية التربية للعلوم الصرفة
قسم الفيزياء

وصف البرنامج الأكاديمي والمقرر الدراسي

قسم الفيزياء

كلية التربية للعلوم الصرفة

Description of Academic Program & Syllabus Department of Physics College of Education for Pure Sciences

اعداد
أ.م.د. محمد هاشم عباس

2025

Introduction

The Department of Physics at the College of Education for Pure Sciences, University of Babylon, is regarded as one of the distinguished academic departments that aims to prepare qualified graduates with deep knowledge and strong research skills in various fields of physics, keeping pace with rapid developments in this vital discipline. The department provides comprehensive academic programs that focus on both theoretical and practical aspects, enabling students to understand fundamental physical principles, analyze natural phenomena using modern scientific methods, and qualify them to work in teaching, research, and industry.

The department is committed to equipping students with advanced scientific and practical skills through a well-balanced curriculum that combines theory and experimentation. It offers well-equipped laboratories with modern instruments and facilities that strengthen students' research capabilities and enhance their applied competencies. The program also emphasizes training in advanced scientific techniques and computational physics, enabling students to process data and analyze results with high accuracy and efficiency.

In light of contemporary scientific and technological progress, the department engages students in research projects covering up-to-date topics such as advanced materials physics, nanophysics, renewable energy, medical and radiation physics, as well as theoretical and computational physics. This qualifies graduates to actively contribute in diverse fields and play a vital role in serving and developing society.

The department also places great importance on fostering students' personalities, enhancing their critical and creative thinking, and encouraging their participation in scientific activities, cultural events, conferences, and specialized symposia. In addition, it provides them with solid educational foundations that prepare them to work effectively in the education sector. Thus, the Department of Physics offers an integrated academic and research environment that contributes to graduating distinguished students who are capable of confidently facing future challenges.

Academic Program Description Form

University Name: **University of Babylon**

Faculty/Institute: **College of Education for Pure Sciences**

Scientific Department: **Physics Department**

Academic or Professional Program Name: **B.Sc.**

Final Certificate Name: **B.Sc. in Physics**

Academic System: **quarterly**

Description Preparation **Date: 2/1/2024**

File Completion Date: **2/2/2024**

Signature:

Head of Department Name: **Dr. Ahmed Hashim**

Date: 9/2/2025

Signature: Khalid S. J

Scientific Associate Name: **Dr. Khalid S. Jassim**

Date: 9/2/2025

The file is checked by: **Dr. May A. A. AL-Yaseen**

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department: Date: 6/2/2025

Signature: M.A.AL-Yaseen

Approval of the Dean

Dr. Bahaa H. Rabee

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University Name**: University of Babylon**

Faculty/Institute**: College of Education for Pure Sciences**

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Academic or Professional Program Name**: B.Sc.**

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Head of Department Name: **Dr. Ahmed Hashim**

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Scientific Associate Name:**Dr. Khalid S. Jassim**

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The file is **een**

Departme ty Performance

Director of the Quality Assurance and University Performance Department:Date: 6/2/2025

Signature:

Approval of the Dean

Dr. Bahaa H. Rabee

1. Program Vision

Our vision for the Department of Physics is for the department to be able to keep pace with the latest scientific and practical techniques in the field of science and technology and to provide the community with graduates capable of teaching in a way that qualifies them to advance and advance the educational process by using new technologies in laboratories and scientific research, as well as providing the community with cards to work in various sectors.Our vision for the Department of Physics is for the department to be able to keep pace with the latest scientific and practical techniques in the field of science and technology and to provide the community with graduates capable of teaching in a way that qualifies them to advance and advance the educational process by using new technologies in laboratories and scientific research, as well as providing the community with cards to work in various sectors.

2. Program Mission

1. Preparing scientifically qualified national cadres in the field of physics and its applications prepared with basic physics knowledge, which will contribute to serving society in the fields of industry.
2. Preparing scientifically qualified cadres in the field of physics to teach in the public education sector, higher institutes, and others.
3. Preparing the student appropriately to enable him to continue graduate studies and scientific research in the various physical sciences and their applications.
4. Providing some scientific, academic, and military bodies in Iraq with qualified researchers to work in industrial, military, and medical research centers, such as centers for environmental studies and radiation protection, the Standards and Metrology Organization, and scientific research centers.
5. Contributing to the preparation and development of specialists in the field of other sciences by teaching physics to the college departments and other scientific colleges at the university.
6. Contributing to development plans in Iraq by participating in solving the scientific and industrial problems facing those plans. And presenting scientific projects that keep pace with developments to support development plans.

3. Program Objectives

1. Forming a basic foundation of the general physics curriculum and a smooth and harmonious study plan.
2. Providing a high level of education and teaching for the bachelor's level by maintaining a serious level of teaching materials and using distinguished methods of teaching and continuous evaluation and development of the study program.
3. Contributing to providing physics courses for all university college departments.
4. Preparing the student to teach the subject correctly, and preparing the student with focused preparation in the principles of physics and the principles of analytical methods required to draw conclusions from physical experiments.

4. Program Accreditation

The program does not have program accreditation.

5. Other external influences

There is no sponsor for the program.

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
institution requirements	3	11	7%	
College requirements	10	20	13%	
Department requirements	43	122	80%	
summer training	2			
Other				

7. Program Description

Year/Level	Course Code	Course Name	Credit Hou	
			theoretical	Credit
1/1	EpsPhPm 100202(2+3)	Properties of Matter	3T+2P	3.5
	EpsPhEli100603(2+3)	Electricity 1	3T+2P	3.5
	EpsPhHe 101405(2+0)	Heat	2	2
	EpsPhCa 102707(4+0)	Calculus	4	4
	EpsPhEp 103409(2+0)	Educational Psychology	2	2
	EpsPhHr 105213(2+0)	Human Rights	2	2
	EpsPhAr 105114(1+0)	English Language	2	2
1/2	EpsPhCm 100101(3+3)	Classical Mechanics	3T+3P	4.5
	EpsPhElii 100704(2+0)	Electricity 2	2	2
	EpsPhGo 101906(2+3)	Geometrical Optics	3T+2P	3.5
	EpsPhLa 102808(3+0)	Linear Algebra	3	3
	EpsPhBe 103510(2+0)	Basis of Education	2	2
	EpsPhCoi 104811(1+2)	Computer 1	2T+1P	2
	EpsPhEl 105012(2+0)	Arabic Language	1	1
	EpsPhHr 105213(2+0)	Democracy	2	2
2/1	EpsPhAei20081(2+3)	Advanced Electricity and Magnetism 1	3T+2P	3.5
	EpsPhPo202004(3+3)	Physical Optics	3T+3P	4.5
	EpsPhVw201303(2+1)	Vibrations and Waves	1T+2P	

	EpsPhAs202306(2+0)	Astronomy	2	2
	EpsPhAc202908 (3+1)	Advanced Calculus	3T+1P	3.5
	EpsPhDp203712(2+0)	Developmental Psychology Science	2	2
	EpsPhMr204714(2+0)	Methodology of Research	2	2
2/2	EpsPhAeii200902(2+3)	Advanced Electricity and Magnetism 2	3T+2P	3.5
	EpsPhEo202105(2+0)	Electron Optics	2	2
	EpsPhAp202407(2+0)	Atmospheric Physics	2	2
	EpsPhDe203009(3+1)	Differential Equations	3T+1P	3.5
	EpsPhNa203310 (2+2)	Numerical Analysis	2T+2P	3
	EpsPhMe203611(2+0)	Management and Educational Supervision	2	2
	EpsPhCoii204913(1+2)	Computer 2	2T+1P	2
		English Language	2	2
3/1	EpsPhAp 301707(3+3)	Atomic Physics	3T+2P	4.5
	EpsPhAe 301103(3+3)	Analog Electronics	3T+3P	4.5
	EpsPhAm 300301(3+0)	Analytical Mechanics	3	3
	EpsPhTh 301505(2+0)	Thermodynamics	2	2
	EpsPhCf 303109(3+0)	Complex Functions	3	3
	EpsPhMe 303811(2+0)	Methods of Education	2	2
	EpsPhEli 304413(2+0)	Elective 1 (Renewable energy)	2	2
		Atomic Physics	2	
3/2	EpsPhQmi 300402(2+0)	Quantum Mechanics1	2	2
	EpsPhMp 301808(2+3)	Molecular Physics	3T+2P	3.5
	EpsPhSp 301606(2+0)	Statistical Physics	2	2
	EpsPhDe 301204(2+3)	Digital Electronic	3T+2P	3.5
	EpsPhMp 303210(3+0)	Mathematical Physics	3	3
	EpsPhCp 303912(2+0)	Counselling and Psychological Health	2	2
	EpsPhElii 304514(2+0)	Elective 2 (Medical Physics)	2	2
		English Language	2	2

4/1	EpsPhQmii400501(3+0)	Quantum Mechanics 2	3	3
	EpsPhNp402605 (4+3)	Nuclear Physics	3T+4P	5.5
	EpsPhSs402504(4+0)	Solid State Physics	4	4
	EpsPhEl401002(4+0)	Electromagnetism	4	4
	EpsPhLp402203 (2+1)	Laser Physics	1T+2P	2.5
	EpsPhMe404006(2+0)	Measurement and Evaluation	2	2
	EpsPhCl404208(0+2)	Clarification Means	2P	1
	EpsPhEliii404607(3+0)	Elective 3 (Plasma Physics)	3	3
		English Language	2	2
4/2	EpsPhAp404109(2+4)	Applications		
	EpsPhGp404310 (2+0)	Graduation Project		

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Learning Outcomes Statement 1
Skills	
To become familiar with the basic concepts of physics.	
To classify the different specializations.	
Ethics	
To evaluate the role of teaching in society.	
To provide service to the community	

9. Teaching and Learning Strategies

1. Thinking strategy according to the student's ability. Example: If the student is able to learn the correct concept of management, he will acquire the skill of managing and organizing his personal life.
2. High thinking skill strategy. Example: If the student wants to make a good decision, it is important that he thinks well before he makes the decision. If he decides without thinking, or if he cannot think well, or if he cannot decide, or perhaps he will not decide, this means He does not have high thinking skills.
3. Critical thinking strategy in learning is a term that symbolizes the highest levels of thinking that aims to pose a problem and then analyze it logically to reach the desired solution.

10. Evaluation methods

1. Written test
2. Preparing quarterly reports
3. Surprise exam
4. Oral exam

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof.	physics				18	0
Assistant Prof.	physics				15	0
Lecturer	physics				10	0
Lecturer	Law				1	0
Assistant Lectu.	Physics				33	0
Assistant Lectu.	Chemistry				5	0
Assistant Lectu.	Arabic				1	0

Professional Development

Mentoring new faculty members

Professional development of faculty members

Professional development for faculty members and academic leaders is a strategic goal sought by universities especially in light of the rapid technical and scientific developments, the multiplicity and diversity of knowledge sources, and the ease of their dissemination and circulation, and in light of the complexity of the academic, research and social roles that they must perform. Faculty members and academic leaders are an important pillar in the advancement of the university. And achieving leadership, this is what makes many universities locally and internationally search for what is new in their professional development programs and methods, in order to achieve a competitive advantage and a prominent academic position.

12. Acceptance Criterion

Acceptance center for graduates of the sixth scientific preparatory school

13. The most important sources of information about the program

1. The methodological book
2. The most important books and sources for the department
3. The university's website
4. University guide
5. Student guide for the initial stages

Program Skills Outline

Year/ Level	CourseCode	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
1/1	EpsPhPm 100202(2+3)	Properties of Matter	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhEli100603(2+3)	Electricity 1	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhHe 101405(2+0)	Heat	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhCa 102707(4+0)	Calculus	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhEp 103409(2+0)	Educational Psychology	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhHr 105213(2+0)	Human Rights	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhAr 105114(1+0)	English Language	B	●	●	●	●	●	●	●	●	●	●	●	●

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Year/ Level	CourseCode	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
1/2	EpsPhCm 100101(3+3)	Classical Mechanics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhElii 100704(2+0)	Electricity 2	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhGo 101906(2+3)	Geometrical Optics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhLa 102808(3+0)	Linear Algebra	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhBe 103510(2+0)	Basis of Education	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhCoi 104811(1+2)	Computer 1	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhEl 105012(2+0)	Arabic Language	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhHr 105213(2+0)	Democracy	B	●	●	●	●	●	●	●	●	●	●	●	●

Program Skills Outline

Year/ Level	CourseCode	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2/1	EpsPhAei20081(2+3)	Advanced Electricity and Magnetism 1	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhPo202004(3+3)	Physical Optics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhVw201303(2+1)	Vibrations and Waves	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhAs202306(2+0)	Astronomy	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhAc202908 (3+1)	Advanced Calculus	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhDp203712(2+0)	Developmental Psychology Science	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhMr204714(2+0)	Methodology of Research	B	●	●	●	●	●	●	●	●	●	●	●	●
			B	●	●	●	●	●	●	●	●	●	●	●	●

Program Skills Outline

Year/ Level	CourseCode	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2/2	EpsPhAeii200902(2+3)	Advanced Electricity and Magnetism 2	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhEo202105(2+0)	Electron Optics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhAp202407(2+0)	Atmospheric Physics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhDe203009(3+1)	Differential Equations	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhNa203310 (2+2)	Numerical Analysis	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhMe203611(2+0)	Management and Educational Supervision	B	●	●	●	●	●	●	●	●	●	●	●	●
	04913(1+2)	Computer 2	B	●	●	●	●	●	●	●	●	●	●		
		English Language	B	●	●	●	●	●	●	●	●	●	●		

Program Skills Outline

Year/ Level	CourseCode	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
3/1	EpsPhAp 301707(3+3)	Atomic Physics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhAe 301103(3+3)	Analog Electronics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhAm 300301(3+0)	Analytical Mechanics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhTh 301505(2+0)	Thermodynamics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhCf 303109(3+0)	Complex Functions	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhMe 303811(2+0)	Methods of Education	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhEli 304413(2+0)	Elective 1 (Renewable energy)	O	●	●	●	●	●	●	●	●	●	●	●	●
		Atomic Physics	B	●	●	●	●	●	●	●	●	●	●	●	●

Program Skills Outline

Year/ Level	CourseCode	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
3/2	EpsPhQmi 300402(2+0)	Quantum Mechanics1	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhMp 301808(2+3)	Molecular Physics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhSp 301606(2+0)	Statistical Physics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhDe 301204(2+3)	Digital Electronic	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhMp 303210(3+0)	Mathematical Physics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhCp 303912(2+0)	Counselling and Psychological Health	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhElii 304514(2+0)	Elective 2 (Medical Physics)	O	●	●	●	●	●	●	●	●	●	●	●	●
		English Language	B	●	●	●	●	●	●	●	●	●	●		

se tick the boxes corresponding to the individual program learning outcomes under evaluation.

Program Skills Outline

Year/ Level	CourseCode	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
4/1	EpsPhQmii400501(3+0)	Quantum Mechanics 2	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhNp402605 (4+3)	Nuclear Physics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhSs402504(4+0)	Solid State Physics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhEl401002(4+0)	Electromagnetism	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhLp402203 (2+1)	Laser Physics	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhMe404006(2+0)	Measurement and Evaluation	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhCl404208(0+2)	Clarification Means	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhEliii404607(3+0)	Elective 3 (Plasma Physics)	O	●	●	●	●	●	●	●	●	●	●	●	●
		English Language	B	●	●	●	●	●	●	●	●	●	●	●	●

Program Skills Outline

Year/ Level	CourseCode	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
4/2	EpsPhAp404109(2+4)	Applications	B	●	●	●	●	●	●	●	●	●	●	●	●
	EpsPhGp404310 (2+0)	Graduation Project	B	●	●	●	●	●	●	●	●	●	●	●	●