Ministry of Higher Education and Scientific Research
Academic Supervision and Evaluation Authority
Quality Assurance and Academic Accreditation Department
Accreditation Department

University of Misan
College of Education / Department of Physics

Academic Program Description and Curriculum Guide

Introduction:

The educational program is a coordinated and organized package of courses that include procedures and experiences organized into study modules. The primary purpose of the program is to build and refine the skills of graduates, making them qualified to meet the requirements of the job market. It is reviewed and evaluated annually through internal or external audit procedures and programs, such as the External Examiner Program.

The academic program description provides a brief summary of the program's main features and courses, indicating the skills students are expected to acquire based on the program's objectives. The importance of this description is evident in that it represents the cornerstone of program accreditation and is written by faculty members under the supervision of academic committees in the academic departments.

This guide, in its second edition, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the new developments and changes in the educational system in Iraq, which included a description of the academic program in its traditional form (annual, semester) in addition to adopting the description of the academic program circulated pursuant to the letter of the Department of Studies TM3/2906 dated 5/3/2023 with regard to programs that adopt the Bologna process as the basis for their work.

In this context, we cannot but emphasize the importance of writing descriptions of academic programs and courses to ensure the smooth running of the educational process.

Concepts and terms:

Academic Program Description: The academic program description provides a concise summary of the program's vision, mission, and objectives, including a precise description of the intended learning outcomes based on specific learning strategies.

Course Description: Provides a concise summary of the course's key features and the learning outcomes expected of the student, demonstrating whether the student has made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture of the future of the academic program, one that is progressive, inspiring, motivating, realistic, and applicable.

Program Mission: Briefly articulates the objectives and activities necessary to achieve them, and identifies the program's development paths and direction.

Program Objectives: Statements that describe what the academic program intends to achieve within a specific time period, measurable and observable.

Curriculum Structure: All courses/subjects included in the academic program according to the approved learning system (semester, annual, Bologna Process), whether required by a ministry, university, college, or scientific department, along with the number of credits.

Learning outcomes: A consistent set of knowledge, skills, and values acquired by a student after successfully completing the academic program. Learning outcomes for each course must be defined in a manner that achieves the program's objectives.

Teaching and learning strategies: These are the strategies used by faculty members to develop student teaching and learning. They are plans followed to achieve learning objectives. They describe all classroom and extracurricular activities to achieve the program's learning outcomes.

Academic Program Description Form

University Name: University of Maysan
College/Institute: College of Education
Scientific Department: Department of Physics
Academic or Professional Program Title: Bachelor of Education in Physics
Final Degree Title: Bachelor of Science in Physics
Academic System: Annual
Description Date: 1/2025

Signature:
Name of Academic Assistant
Rana Sabeh
Date:

Signature:
Name of Department Head:
Younis Mohmed Atiah
Date

File reviewed by the Quality Assurance and University Performance Division
Name of Director of the Quality Assurance and University Performance Division:
Sami Hatab Jasim
Date:
Signature

Dean's approval

Baraq Talib Shalash Al-Moussawi

1. Program vision

The Department of Physics aspires to leadership and excellence in the field of physics education studies, achieving quality standards at the local and regional levels, distinguished academic research and program accreditation, making it a department of excellence, regionally and globally. All this is in order to contribute to the progress of the country, the development of society, and to reach the ranks of international colleges. It also aims to establish an educational environment characterized by the quality of scientific research and teaching methods through advanced technologies, ensuring the advancement of the level of the department's graduates, as well as providing an ideal environment in which students cooperate with faculty members to serve the community.

2. Program message

The Physics Department at the College of Education, University of Maysan, is committed to establishing excellence in higher education by offering distinguished educational programs in the basic sciences, enabling students to acquire basic and advanced knowledge in various fields of physics. Furthermore, it provides an appropriate environment for students to acquire the necessary skills that qualify them to compete as professionals capable of enriching the labor market. On the other hand, the Physics Department seeks to enhance the efficiency of its teaching staff in the fields of scientific research, thus contributing to the advancement and excellence of this department and college in basic and applied sciences. This will contribute effectively to solving problems in various sectors of society based on solid scientific foundations, contributing to the comprehensive development sought by the new Iraq. Preparing competent graduates with the skills and knowledge in various physics disciplines, which qualifies them to work in the states scientific, educational, and research institutions and to serve community issues.

3. Program objectives

* Preparing teaching staff to support middle, secondary and preparatory schools with the necessary teaching skills to teach physics through the department's scientific programs and activities.
* Graduating students are familiar with the basic concepts of physics.
* Students are qualified to complete postgraduate studies to support universities and institutes with teaching staff.

* Activating mechanisms of joint cooperation and openness to various universities and educational institutions at the local, regional and international levels in a manner that includes all components of the educational system.
* Working with other college departments to enter international rankings.
* Embracing distinguished and outstanding students and motivating and encouraging them to be future scientific leaders, whether as instructors or researchers.
* Working to improve and develop the capabilities and skills of faculty members and all college employees to ensure comprehensive quality management in scientific and administrative fields.
* Developing the Physics Department's laboratories in line with the quality of laboratories.

4. Program accreditation

It has not happened yet, as the program accreditation standards for educational colleges were approved on 9/8/2024, according to Circular No. J D/A 905 dated 2/22/2024.

5. Other external influences

N/A

6. Program structure

Program structure	Number of courses	Study unit	percentage	comments
Institutional Requirements	7	14	7.9	Basic
College Requirements	9	32	18.2	Optional
Department Requirements	23	122	69.3	Basic
Summer Internship	1	4	2.2	Basic
Other (Research Project)	1	4	2.2	Basic

* Notes may include whether the course is Basic or optional.

7. Program description

First stage

#	Name of the course	Number of hours		Number of units
		Theory	Practice	
1	Mechanics	3	2*	7
2	Heat and Materials Properties	2	-	4
3	Electricity and Magnetism I	3	2*	7
4	Mathematics I	3	-	6
5	Computer I	1	2*	3
6	Educational Psychology	2	-	4
7	Principal of Education	2	-	4
8	Arabic Language	2	-	4
9	English	2	-	4
10	Human Rights & Democracy	1	-	2
	Total	21	6	45

Second stage

#	Name of the course	Number of hours		Number of units
		Theory	Practice	
1	Optics	3	2*	7
2	Astronomy	2	-	4
3	Electricity and Magnetism II	3	2*	7
4	Mathematics II	3	-	6
5	Computer II	1	2*	4
6	Sound and wave motion	2	-	4
7	Secondary Educational and Educational management	2	-	4
8	Growth Psychology	2	-	4
9	Fundamental of Scientific research	2	-	4
	Total	19	6	43

Third stage

#	Name of the course	Number of hours		Number of units
		Theory	Practice	
1	Atomic and Molecular Physics	3	2*	7
2	Thermodynamics	3	-	6
3	Electronics	3	2*	7
4	Analytical Mechanics	3	-	6
5	Complex Functions	3	-	6
6	Psychology Guidance and Psychology Health	2	-	4
7	Curriculum and Methods of Teaching	2	-	4
8	Optional	2	-	4
	Total	16	10	44

Four stage

#	Name of the course	Number of hours		Number of units
		Theory	Practice	
1	Nuclear Physics	3	2	7
2	Leaser	3	-	6
3	Electromagnetic Theory	3		6
4	Quantum Mechanics	3		6
5	Solid state Physics	3		6
6	Measurement and Evaluation	2	-	4
7	Practical Education	2		4
8	Research Project	2	-	4
9	Demonstration Instruments Laboratory	-	2	1
	Total	14	10	44

8. Expected learning outcomes of the program

knowledge	
1 .Technical knowledge in the fields of physics. 2. Understanding the practical applications of physics. 3.Teamwork and communication skills. 4. Providing students with teaching, educational guidance, and classroom management skills.	1. Providing graduates with specialized scientific skills that qualify them to work and implement work related to physics. 2. Building a deep theoretical and practical scientific foundation aimed at providing graduates with knowledge of how to operate measuring and testing devices for scientific research and industrial applications. 3. Adopting sound scientific formulas in developing curricula for all academic levels, enabling graduates to acquire scientific skills in analyzing problems and finding immediate solutions. 4. Developing elective courses in the fourth year that are relevant to specific specializations in various fields of physics. The percentage of elective courses in graduate studies is expected to increase. 5. The Scientific Committee in the Physics Department is responsible for reviewing research submitted as graduate projects or the department's annual research plan. It also contributes to developing and periodically updating curricula and indirectly supervises the academic progress of students.
Skills	
1. Skills and abilities of physics program graduates. 2. Linking physical theories to their practical applications. 3. Personal skills and responsibility. 4. Cognitive skills.	1. Identify skills that support the professional development of physics teachers in their learning approaches and enrich the educational field by exploring the latest digital technologies, thus opening up new horizons for knowledge and adapting them to learner needs and learning styles. 2. Link theoretical and practical aspects in the fields of materials science and solid-state physics, and how to handle laboratory equipment used in the study of materials physics. 3. Learn independently, work as a team, and recognize the work of others. 4. Apply their knowledge and understanding to solve qualitative and quantitative problems of a natural nature.
values	
1. Adherence to professional ethics	1. Explaining the importance of scientific values, which are among the most important responsibilities

2. Commitment to scientific values in the physical sciences 3. Integrity and ethics 4. Knowledge and learning	of education and teaching, and highlighting the importance of scientific values in countering negative messages transmitted through modern communication media. 2. The program focuses on promoting ethical values and integrity in the field of physics, and teaches students the importance of ethical rules and proper behavior in the field of technology. 3. The program enhances the value of knowledge and learning by providing an educational environment that encourages the acquisition of knowledge and the development of skills in various fields of physics.

9. Teaching and learning strategies

The teaching and learning strategies and methods adopted in implementing the program are:
1. Active and participatory learning
2. Project-based learning
3. Collaborative learning
4. Problem-based learning
5. Lecture method using technology for learning
6. Stimulating curiosity and exploration
7. Laboratory teaching strategies

10. Evaluation methods

* Monthly exams
* Daily exams
* Group projects
* Reports

Teaching staff

#	NAME	Certificate	Academic title	General and specific specialization
1	Younis Mohammad Attia Al-Zahiwat	PhD	Professor	Theoretical Physics / Lasers and Optics
2	Mohammad Kadim Hamad Al-Hashemi	PhD	Professor	Polymer and Nano film Physics
3	Baraq Talib Shalash Al-Mousawi	PhD	Professor Assistant	Applied Physics / Composite Materials
4	Mohammad Salem Jassim	PhD	Professor Assistant	Theoretical Physics / Lasers and Optics
5	Ahmed Saleh Khuraibat	PhD	Professor Assistant	Computer Engineering Technology
6	Haider Ahmed Hassan	PhD	Lecturer	Polymer Physics
7	Mohammad Siham Sada	PhD	Lecturer	Solid-State/Nano Physics
8	Duaa Hussein Hashim	PhD	Lecturer	Micro antennas
9	Wissam Ruwais	Master	Lecturer	Nanotechnology
10	Sara Qahtan Hussein	Master	Lecturer Assistant	Solid-State Physics
11	Ali Hisham Abdul-Jabbar	Master	Lecturer Assistant	Space Physics and Astronomy
12	Emad Kadim Muajib	Master	Lecturer Assistant	Complex analysis
13	Hassanein Rahim Karim	Master	Professor Assistant	Information Technology
14	Anmar Ali Kadim	Master	Lecturer Assistant	Literature and Arabic Language
15	Mai Qasim Radhi	Master	Lecturer Assistant	Modern History
16	Zahraa Hammadi Bajay	Bachelor	Physical Assistant	Physical Sciences
17	Israa Naim Abdul-Ridha	Bachelor	Physical Assistant	Physical Sciences
18	Jihan Abdul-Hussein Laibi	Bachelor	Physical Assistant	Physical Sciences

Professional development

1. Development and training programs
2. Guidance and support programs
3. Participation in workshops in the field of modern teaching methods
4. Academic guidance

Professional development for faculty members

1. Needs analysis
2. Implementation of training programs and workshops
3. Application of modern teaching strategies
4. Monitoring and evaluating performance
5. Evaluation of feedback and support

Acceptance criteria

Through the Ministry of Higher Education and Scientific Research

1. Admission is centralized
2. Parallel admission channel
3. Admission channel for senior teachers

Course description form

1- Course name	**Mechanic**
2- Course code	PH 101
3- Semester/Year	annual
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	hours (3 hours of theory and 2 150 hours of practical work per week) (5 hours * 30 weeks)
7- Name of the course administrator (if more than one name is mentioned	Name: Prof. Dr. Younis Mohamed Attia **younisal_zahy72@yahoo.co.uk**

Course objectives .1

- The objective of the course is to introduce students to the methods of mechanics and develop the mathematical skills required to solve problems in mechanics, dynamics, and other areas of theoretical physics. - Understand and comprehend the important theoretical mathematical derivations needed to explain various mechanical kinetic phenomena.	-	Objectives of the study subject

Teaching and learning strategies .1

1. In-person lectures in classrooms. **2. Discussion methods, surprise exams, and skill-building techniques.** **3. Posing intellectual questions or holding competitions among students, stimulating creative thinking, and providing clear and prompt answers to emerging issues.**	The strategy

Course structure .1 .1

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**Introducing the student to vector analysis and its importance.**	**Introduction to Vectors, their Analysis, and Importance**	**9 hours**	**1,2,3**

		Basic vector concepts.			
Quarterly and daily attendance exams	**In-person lectures**	**Introducing the student to vector units, magnitude, scalar and cross product of vectors, their properties, and uses.**	**Basic Vector Concepts**	**9 hours**	**4,5,6,**
Quarterly and daily attendance exams	**In-person lectures**	**Gaining knowledge in understanding the meaning of motion in one dimension and how to apply it.**	**Motion in One Dimension**	**9 hours**	**7,8,9**
Quarterly and daily attendance exams	**In-person lectures**	**Understanding motion in two dimensions.**	**Kinematics of Particles in Straight Line Motion, Free Fall, and Objects Being Projected**	**12 hours**	**10,11,12,13**
Quarterly and daily attendance exams	**In-person lectures**	**Understanding motion in a straight line.**	**Equations of Projectile Motion in a Uniform Gravitational Field**	**3 hours**	**14**
Quarterly and daily attendance exams	**In-person lectures**	**Defining Newton's laws of motion and when to use them in different situations.**	**Definition and Derivation of Newton's Laws**	**3 hours**	**15**
Quarterly and daily attendance exams	**In-person lectures**	**Dealing with the laws of motion in the presence of friction.**	**Friction and Actual Frictional Forces**	**3 hours**	**16**
Quarterly and daily attendance exams	**In-person lectures**	**Defining uniform and non-uniform circular motion and deriving their laws.**	**Circular Motion**	**6 hours**	**17**

Quarterly and daily attendance exams	**In-person lectures**	**Understanding potential and kinetic energy and the law of conservation of energy.**	**Understanding Work, Potential and Kinetic Energy, the Law of Conservation of Energy, and Conditions for Conservation of Force**	**3 hours**	**18**
Quarterly and daily attendance exams	**In-person lectures**	**Understanding linear momentum and the linear momentum theorem.**	**Linear Momentum, Impulse, and Collisions**	**6 hours**	**19,20**
Quarterly and daily attendance exams	**In-person lectures**	**Understanding rotational kinetic energy and moment of inertia.**	**Rotational Motion**	**6 hours**	**21,22**
Quarterly and daily attendance exams	**In-person lectures**	**Introducing the student to how to find the oscillator.**	**Finding the Potential Energy Function of a Particle, and the Descent, Divergence, and Twist of Vectors**	**9 hours**	**23,24,25**
Quarterly and daily attendance exams	**In-person lectures**	**Introducing the student to harmonic oscillators in two and three dimensions.**	**Derivations of Motion in a Harmonic Oscillator**	**9 hours**	**26,27,28**
Quarterly and daily attendance exams	**In-person lectures**	**Introducing the student to the motion of a simple pendulum and DE Broglie waves.**	**Simple Pendulum and De Broglie**	**6 hours**	**29,30**

Course evaluation .2

Distributing a grade out of 100 based on what the student decides, such as attendance, daily attendance, monthly reports, reports, etc.

Learning and teaching resources .1 .2	
1 - Physics for Scientists and Engineers with modern JEWETT , 9 Edition , 2014 . physics , SERWAY and 2- University Physics by Francis W. Sears, Mark W. Zemanseky and Hugh D. Young, 1982. 3- Introduction to Physics by Jojn D.Cutnell, Kenneth W.Johnson 8th Ed.,2010	Main references (sources)
	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

1- Course name	Heat and Properties of material
2- Course code	Ph 103
3- Semester/Year	annual
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	60 hours
7- Name of the course administrator (if more than one name is mentioned	

Course objectives .2

-Students learn about heat and the properties of matter, which they use to understand the principles of physics in everyday life. -How to apply this knowledge to everyday situations in education, family, and society.		Objectives of the study subject

Teaching and learning strategies .2

1. In-person lectures in classrooms. **2. Discussion methods, surprise exams, and skill-building techniques.** **3. Posing intellectual questions or holding competitions among students, stimulating creative thinking, and providing clear and prompt answers to emerging issues.**	The strategy

Course structure .1 .3

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**Temperature measurement, types of thermometers, thermal expansion, methods of heat transfer,**	**Gain knowledge in the field of heat physics and its use in building human civilization in general, and the types of laws and mechanics of heat transfer.**	**9 hours**	**1,2,3**
Quarterly and daily	**In-person lectures**	**Sources of thermal energy, specific heat, the**	**Gain knowledge in the field of basic**	**9 hours**	**4,5,6,**

attendance exams		**first law of thermodynamics.**	**energy sources of thermodynamics.**		
Quarterly and daily attendance exams	**In-person lectures**	**Real gas and ideal gas. Kinetic theory of suspended gases between Cv and Cp.**	**Gain knowledge in distinguishing between ideal and real gases.**	**9 hours**	**7,8,9**
Quarterly and daily attendance exams	**In-person lectures**	**Density and specific gravity. Surface tension. Bernoulli's equation. Viscosity.**	**Gain knowledge in the field of influence and viscosity.**	**12 hours**	**10,11,12,13**
Quarterly and daily attendance exams	**In-person lectures**	**Types of stress and strain. Young's modulus. Relationship between mechanical properties and temperature.**	**Gain knowledge in the mechanics of materials.**	**3 hours**	**14 ,15**
Quarterly and daily attendance exams	**In-person lectures**	**Study of magnetic properties of materials. Material classification. Electrical conductivity. Conductors, insulators, and semiconductors. Electrical conductivity. Electrical resistivity. Specific resistivity. Hall effect. Piezoelectricity. Ferroelectricity. Relationship between electrical**	**Gain knowledge in the field of magnetic properties of materials.**	**12 hours**	**16-19**

		conductivity and temperature. Superconductors.			
Quarterly and daily attendance exams	**In-person lectures**		**Gain knowledge in the field of electrical properties of materials.**	**12 hours**	
Quarterly and daily attendance exams	**In-person lectures**	**Plasma.**	**Gain knowledge in the field of the fourth state of matter, plasma.**	**6 hours**	**20,21**
Quarterly and daily attendance exams	**In-person lectures**	**Composite materials. Classification of engineering materials. Organic materials. Classification of polymers. Polymers. A. Classification according to structure: linear polymers. Polymers. Branched polymers. Cross-linked polymers. Networks.**	**Gain knowledge in the field of basic reinforced embroidered overlays.**	**3 hours**	**22-26**
Monthly exam.					
Quarterly and daily attendance exams	**In-person lectures**	**Classification of polymers according to their thermal behavior: thermosetting polymers, thermoplastic**	**Gain knowledge in the field of basic reinforced embroidered overlays.**	**6 hours**	**28-30**

		polymers, flexible polymers, inorganic materials, composites, matrix materials, metal composites, ceramic composites, polymer composites, hybrid composites, reinforcing materials, advantages of hybrid composites, interface and bonding strength.			

Course evaluation .2

Distributing a grade out of 100 based on what the student decides, such as attendance, daily attendance, monthly reports, reports, etc.

Learning and teaching resources .1 .4

1.Heat and Materials of properties ,by Kadem Ahmed mohemed 2. The Science and Engineering of ed Donald R. Askeland Materials, 3.Heat and Thermodynamics, Mark W. Zymansky.	Main references (sources)
	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

1- Course name	Electricity and Magnetism 1
2- Course code	PH 102
3- Semester/Year	annual
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**Hours 90 (2 hours per week * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name: Sarah Qahtan

Course objectives .3

-Students learn about the importance of electricity in our lives. -How to use this knowledge to benefit from electricity and avoid its dangers in daily life.		Objectives of the study subject

Teaching and learning strategies .3

Definition of electricity, related laws, electric fields and vertical fields of charged particles, identification of capacitors and resistors, types of each, areas of use, and applications. Definition of electric current, how electricity is transmitted, and calculation of unknowns. Skills related to the subject. Providing the student with theoretical knowledge of electricity and magnetism. Providing the student with practical knowledge of electricity and magnetism.	The strategy

Course structure .1 .5

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**General lecture on electrostatics - electric charges, Coulomb's law, unit systems, conductors, insulators, and semiconductors.**	**Gain knowledge in understanding the meaning of static electricity and unit systems.**	**24hours**	**1-8**
Quarterly and daily attendance exams	**In-person lectures**	**Electric fields and their calculations.**	**Gain knowledge in understanding**	**18hours**	**9-14**

		Electric lines of force, Gauss's law and its applications. - The field of a charged conductor.	**the meaning of electric fields.**		
Quarterly and daily attendance exams	**In-person lectures**	**Electric potential, electric potential difference, potential energy, equipotential surfaces, potential gradient, potential of a charged conducting sphere.**	**Gain knowledge in understanding the meaning of electric potential.**	**18hours**	**15-21**
Quarterly and daily attendance exams	**In-person lectures**	**Electric capacitors and their types, electric capacitance, connecting capacitors in series and parallel, the effect of dielectrics on capacitance, energy stored in capacitors.**	**Gain knowledge in understanding the meaning of capacitors and insulating materials.**	**15hours**	**22-26**
Quarterly and daily attendance exams	**In-person lectures**	**Electric fields and their calculations. Electric lines of force, Gauss's law and its applications. - The field of a charged conductor**	**Gain knowledge in understanding the meaning of electric fields.**	**9hours**	**27-30**
Course evaluation .2					

*** Semi-daily and monthly tests and surprise exams.**
*** Dividing the class into several groups, giving each group a variety of exercises, and making the evaluation process mutual among students.**

Learning and teaching resources .1 .6

1- fundamentals of physics, Holliday and Resnick (9th edition 2011) (2014). 2 – electricity and magnetism, Edward M. Purcell and David Morin (3rd edition 2013) 3 - electricity and magnetism, A.A. Rang 1998 4 - electricity and magnetism, Francis Weston Sears 1958. 5- De Queiroz, A. C. "Operation of the Wimshurst Machine" (2014)	Main references (sources)
	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

4. Course Name:	Calculus
5. Semester / Year:	Annual
6. Description Preparation Date:	2024/2025
7. Available Attendance Forms:	Lectures are delivered to students in person according to the schedule announced in the department
8. Number of Credit Hours (Total) / Number of Units (Total)	*150 hours, (5 hours per week *30 per week)
9. Course administrator's name (mention all, if more than one name)	
10. Course Objectives	
Course Objectives	* Students' understanding of the three conic sections (equivalent, plus, and minus), how to draw them, identify everything they contain (vertices, foci, and axes), and show all changes to them in the event of changing the center, dragging, or rotating each of them. * An expanded and complementary study of the first stage regarding vectors and parametric equations. * Expanding students' understanding regarding the subject of the function with one variable, its purpose and continuity, finding the derivative using the geometric method, and studying the applications of the derivative. * Study and understand integrals, methods of solving them, and applications of integration. * Introducing students to the concept of some functions, such as trigonometric functions and their inverses, as well as exponential and logarithmic functions.
11. Teaching and Learning Strategies	
Strategy	* In-person lectures in classrooms. * Discussion method, surprise exams, and methods of refining skills. * Asking intellectual questions or holding a competition between students, stimulating creative thinking and answering clearly and quickly to the problems presented.

12. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

5 weeks	25 hours	The student will be able to understand the given material,	conic sections (their equations/drawing)	In person lectures	Semester and daily in-person exams.
6 weeks	20 hours	The student will be able to understand the given material	understand the subject of the function its purpose, and continuity	In person lectures	Semester and daily in-person exams.
8 weeks	30 hours	The student will be able to understand the given material	Derivatives, their applications, and the use of Rolle's theorem and the mean value	In person lectures	Semester and daily in-person exams.

13. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
14. Learning and Teaching Resources	
equired textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course description form

1- Course name	**Computer I**
2- Course code	
3- Semester/Year	Annual
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**60 hours ‘2 hours per week *30 per week**
7- Name of the course administrator (if more than one name is mentioned	Name: Ali Atima **ali_ataeemh@uomisan.edu.iq**

Course objectives .15

1. Provide students with basic knowledge of computer components and operating systems. 2. Enable students to use basic office software such as word processors and spreadsheets. 3. Introduce students to basic programming concepts using programming languages suitable for beginners. 4. Develop students' skills in using computers as a tool for analyzing physical data and solving scientific problems. 5. Prepare students to use computer technologies in advanced studies and scientific research.		Objectives of the study subject

4. Teaching and learning strategies

1. In-person lectures at academic universities. 2. In-person lectures in science laboratories. 3. Excellent discussion and exam methods and skill-building techniques. 4. Pose innovative or creative questions among students, stimulate creative thinking, and provide clear and prompt answers to the problems presented.	The strategy

Course structure .1 .7

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**Introduction to Computer Science: Basic**	**The student is able to**	**10hours**	**weeks 5**

		concepts, importance, objectives, and the historical development of computer technology.	**understand the given material**		
Quarterly and daily attendance exams	**In-person lectures**	**Hardware components of a computer: input and output devices and types of memory.**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Software components of a computer and types of applications.**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Introduction to the operating system, introduction to the Windows operating system, and a comprehensive overview of the functionality of the operating system.**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Introduction to using word processing software (Microsoft Word)**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Introduction to using spreadsheet software (Microsoft Excel)**	**The student is able to understand the given material**	**10hours**	**5weeks**

Course evaluation .2

***Semi-present and monthly changes, and surprise exams.**
Daily musical quality
Focus on the computer

Learning and teaching resources .1 .8	
Fundamentals of Computer Science, Part One, by Assistant Professor Ziad Mohammed Abboud, Professor Ghassan Hamid, and Assistant Professor Amir Hussein. Fundamentals of Computer Science, Part Two, by Assistant Professor Ziad Mohammed Abboud, Professor Ghassan Hamid, and Assistant Professor Amir Hussein.	Main references (sources)
	Recommended supporting books and references .(scientific journals)
https://learn.microsoft.com	ctronic references, Internet sites

Course description form

Developmental psychology	Course name .1
	:Course code .1
annual	:Semester/Year .1
2024/2025	Date this description was .1 :prepared
Lectures are delivered to students in person according to the schedule announced in the department	:Available forms of attendance .1
(2 hours per week * 30 weeks) 60hours	Number of study hours .1 (total)/number of units (total)
	Name of the course .1 administrator (if more than one name is mentioned)

Course objectives .16

1-Know the concept of developmental psychology 2_ Explaining the stages of linguistic development 3_Know the stages of human cognitive development 4_ Know the stages of human development 5_ Distinguish between the branches of developmental psychology		Objectives of the study subject

Teaching and learning strategies .5

1. In-person lectures in classrooms. 2. Discussion method, surprise exams, and methods of refining skills. Asking intellectual questions or holding a competition between students, stimulating creative .3 .thinking and answering clearly and quickly to the problems presented	**strategy**

Course structure .1 .9

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**Developmental . psychology, its definition and importance. Meaning of growth. ……Laws of growth**	**The student is able to understand the given material**	**10hours**	**5 Weeks**

Quarterly and daily attendance exams	**In-person lectures**	**Factors affecting growth, genetic factors, environmental ...factors**	**The student is able to understand the given material**	10hours	**5 Weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Research methods in developmental psychology, methods of collecting information..**	**The student is able to understand the given material**	**10hours**	**Weeks 5**
Quarterly and daily attendance exams	**In-person lectures**	**The stage of childhood: its definition, importance, stages, physical growth, mental development, emotional development, sensory ...development**	**The student is able to understand the given material**	**10hours**	**5 Weeks**
Quarterly and daily attendance exams	**In-person lectures**	**The role of social institutions in the socialization of the child, family, school, peers, and the media.**	**The student is able to understand the given material**	**10hours**	**5 Weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Adolescence, its definition, importance, stages, physical growth, mental development, cognitive and moral development**	**The student is able to understand the given material**	**10hours**	**5weeks**
Course evaluation .2 .10					
*** Semi-daily and monthly tests And surprise exams.** **Daily class participation**					
Learning and teaching resources .3					

. - Childhood and Adolescent Psychology, Al-Alusi; Jamal Hussein (1983), Baghdad - University of Baghdad. - Evolutionary Psychology; Arifaj, Sami, (1993) Jordan_Amman, Majdalawi Publishing House. - Introduction to developmental psychology, Alwan, Fadia (2003), Cairo - Arab House Library. -The psychology of development. Al-Anani, Hanan Abdel Hamid (2003)	Required textbooks (methodology, if any)

Course description form

1- Course name	**Foundations of education**
2- Course code	
3- Semester/Year	Annual
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**90 hours, (3 hours per week * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name : May Kasim

Course objectives .17

1. Introduce students to the importance of education in university life. 2. Introduce students to the foundations of ancient education, including Chinese, Roman, and Islamic education. 3. Apply the correct educational principles students have learned in their daily lives. Identify correct educational applications to benefit from them in public life.		Objectives of the study subject

6. Teaching and learning strategies

1- In-person lectures at academic universities. 2- Discussion methods for older adults' perspectives to crack the critical codes of the Primer personality. 3- Posing creative questions or brainstorming, and their abilities and capacity for dialogue and discussion.	The strategy

Course structure .1 .11

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**The Meaning of Education: Its Objectives, Councils, and Fields**	**The student is able to understand the given material**	**15 hours**	**weeks 5**

Quarterly and daily attendance exams	**In-person lectures**	**The Historical Basis of Ancient Chinese and Greek Education**	**The student is able to understand the given material**	**15 hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Pre-Islamic and Post-Islamic Arab Education**	**The student is able to understand the given material**	**15 hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**The Social Basis of Education**	**The student is able to understand the given material**	**15 hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Education and its Impact on Economic Development and the Exploitation of Natural Resources: The Scientific Basis**	**The student is able to understand the given material**	**15 hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Education in the Islamic Basis: Educational Applications**	**The student is able to understand the given material**	**15 hours**	**5weeks**

Course evaluation .2

***Representing the semi-annual, monthly, and surprise exams.**
*** I decided to write simple reports on any educational information.**

Learning and teaching resources .1 .12

- The Republic, Plato: translated by Hanna Khabbaz, Dar Al Turath, Beirut, 1969. - Introduction to the Philosophy of Education, Fayor, D.G.: translated by Muhammad Saif al-Din Fahmy, Anglo-Egyptian Library, Cairo, 1982. - Ibn Rushd and His Philosophy Among the Contemporary Heritage, Al-A'asim, Abdul Amir: Vol. 3, Bayt al-Hikma, Baghdad, 1999. - The Philosophy of Islamic Education in the Hadith, Bakr, Abdul Jawad Sayyid: Dar al-Fikr al-Arabi, Cairo, 4, 1983.	Main references (sources)
	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

Arabic language	Course name .1
	:Course code 2-
annual	:Semester/Year .1
2024/2025	Date this description was .1 :prepared
Lectures are delivered to students in person according to the schedule announced in the department	Available attendance forms .18
(2 hours per week * 30 weeks) 60hours	Number of study hours .1 .19 (total)/number of units (total)
	Name of the course administrator (if more than one name is mentioned .20

Course objectives .21

Correcting the tongue and hand from making linguistic errors, Preparing linguistically, literary, and pedagogically qualified personnel for research and teaching in various educational institutions, especially the basic stage Raising a generation that cares about its nation's intellectual and literary heritage Working to preserve the fluency of the Arabic language Enriching libraries with research and studies, including serious university theses Filling the needs of universities, research centers and the Ministry of Education in linguistic, literary and educational specializations Introducing students to the Arabic heritage of language and literature, as well as the correct educational curricula	Objectives of the study subject

Teaching and learning strategies .7

1. In-person lectures in classrooms. **2. Discussion method, surprise exams, and methods of refining skills.** **Asking intellectual questions or holding a competition between students, stimulating creative 3 .thinking and answering clearly and quickly to the problems presented**	e strategy

Course structure .1 .13

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week

Quarterly and daily attendance exams	**In-person lectures**	**...Sections of speech**	**The student is able to understand the given material**	**10hours**	**weeks 5**
Quarterly and daily attendance exams	**In-person lectures**	**Definition of construction, types of constructed ...nouns**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Relative nouns, pronouns**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Irregular nouns and verbs, short and incomplete, places where the hamza inna is broken**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**The five verbs, the five nouns, the dual noun, the sound masculine plural, the sound feminine plural, and the .prohibited noun**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**A poem of optimism and hope, Arabic calligraphy, a poem by strangers, audio clip, solar and lunar letters**	**The student is able to understand the given material**	**10hours**	**5weeks**

Course evaluation .2

*** Semi-daily and monthly tests**
And surprise exams.

Daily class participation

Learning and teaching resources .1 .14

The Arabic language, education and skills, Dr. Ahmed Ayoub Girgis Arabic language rules and application - Dr. Ahmed Shalabi Arabic Grammar by Abdul Latif Al-Saidi	Required textbooks (methodology, if any)

Study of linguistic sound, Dr. Ahmed Mukhtar Omar	
The complete poetic works of Ibrahim Tuqan Arabic calligraphy, its origins and development, Dr. Adel Al-Alusi	Main references (sources)
	Recommended supporting books and references (scientific journals).
	Electronic references, Internet sites

Course description form

1- Course name	**English**
2- Course code	
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**Hours 60 (2 hours per week * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	

Course objectives .22

The course focuses on the appropriate use of English language both written and spoken. This course depends on teaching grammar, listening, skills work, vocabulary and lessons in everyday English. All these lessons will help the students to collect good information making them qualified to use English.		Objectives of the study subject

Teaching and learning strategies .8

1- In-person lectures at academic universities. **2- Discussion method specific to the perspectives of older adults to crack the critical codes of the Primer personality.** **3- Pose creative questions or brainstorm, appreciate their ideas, and engage them in dialogue and discussion.**	The strategy

Course structure .1 .15

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	Verb “to be”, greetings and numbers.	**The student is able to understand the given material**	**10hours**	**weeks 5**
Quarterly and daily attendance exams	**In-person lectures**	Singular and plural nouns. practicing conversations.	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	Pronouns (subjective,	**The student is able to**	**10hours**	**5weeks**

		objective and possessive)	**understand the given material**		
Quarterly and daily attendance exams	**In-person lectures**	Countries, numbers (11-30)	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	Verb "to be" (is, are, am) in positive and negative	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	Verb "to be" (is, are, am). Questions with question word as well as Yes /No questions	**The student is able to understand the given material**	**10hours**	**5weeks**

Course evaluation .2

*** Semi-daily and monthly tests**
And surprise exams.
Daily class participation

Learning and teaching resources .1 .16

1.New Headway beginner student's book, forth education Jhon and Liz Soars, Oxford University press 2010. 2.Vocabulary that related to computer science (Google website)	in references (sources)
	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

1- Course name	**Human Rights**
2- Course code	
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**Hours 60 (2 hours per week * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name: May Kasim

Course objectives .23

- To provide students with knowledge of the conceptual and historical development of human rights and democracy. - To develop students' analytical and critical skills regarding the reality and future of human rights and democracy. - To train students on the important participants in aspects of public life, such as those who uphold human rights principles and participate in popular political life. - To encourage students to understand the importance of education in spreading the culture of human rights and democracy in building a civilized society based on good governance, the most important components of which are faith and humanity. Their education allows them to participate in governance through free and fair elections.		Objectives of the study subject

Teaching and learning strategies .9

1- In-person lectures at academic universities. **2- Discussion method specific to the perspectives of older adults to crack the critical codes of the Primer personality.** **3- Pose creative questions or brainstorm, appreciate their ideas, and engage them in dialogue .and discussion.**	The strategy

Course structure .1 .17

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week

Quarterly and daily attendance exams	**In-person lectures**	**Historical roots of human rights, human rights in ancient civilizations, human rights in divine laws (Judaism, Christianity, Islam)**	**The student is able to understand the given material**	**10hours**	**weeks 5**
Quarterly and daily attendance exams	**In-person lectures**	**Human rights in the modern era and contemporary recognition of human rights, the content of human rights in international and regional conventions.**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Terrorism (its causes, combating terrorism), corruption: its conceptual definition, causes, methods of combating it, treatment, and types.**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Forms and generations of human rights, individual and social rights, civil and political rights, guarantees and protection of human rights at all levels, the meaning and concept of**	**The student is able to understand the given material**	**10hours**	**5weeks**

		democracy, social balance.			
Quarterly and daily attendance exams	**In-person lectures**	**Old and new democracy, types of democracy and their principles, waves of democracy in the twentieth century.**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Principles governing majority rule, principles of separation of powers, the concept of the rule of law, the concept of transfer of power, the concept of decentralization, the pillars and conditions of a democratic system, and the characteristics of a democratic system.**	**The student is able to understand the given material**	**10hours**	**5weeks**

Course evaluation .2

***Representing the semi-annual, monthly, and surprise exams.**
*** decided to write simple reports on any educational information.**

Learning and teaching resources .1 .18

Hadi, Riyad Aziz. (2005). Human Rights (Their Experience, Their Guardians, Their Protectors) (Baghdad). Al-Sindi, Naz. Badrkhan. (2012). Human Rights and Democracy. Ibn Rushd College of Education for Human Sciences, University of Baghdad.	in references (sources)

Al-Dulaimi, Hafez Alwan. (2009). A Contemporary Reading of the Subject of Human Rights	
	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

1- Course name	**Optics**
2- Course code	**PH 202**
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**150Hours**
7- Name of the course administrator (if more than one name is mentioned	Name: Baqer Obaid al-Nashy baqernano@uomisan.edu.iq

Course objectives .24

1. Define the various terms of light phenomena. 2. Define radiometry, and radiation and their importance in medical science. 3. Summarize the optical system features, and the geometrical laws. 4. Discuss the general properties of light and the wave equation. 5. Describe the geometry of light in the optical instrument and how the image formation. 6. Define light and identify the laws of light and its interactions with body's tissues. 7. Explain the light diffusion and their equations.		Objectives of the study subject

Teaching and learning strategies .10

Expanding students' perceptions about optics science and its contents. In addition to the use of different tools and experiments in distinguishing the light interaction through observations and measuring. This will be achieved through lectures, labs, and interactive tutorials and by types of practical activities..	The strategy

Course structure .1 .19					
Evaluation method	**Learning method**	**Name of the unit or topic**	**Required learning outcomes**	**hours**	**the week**
Quarterly and daily attendance exams	**In-person lectures**	**Introduction: Properties of Light, Electromagnetic Spectrum.**	**The student is able to understand the given material**	**10hours**	**2 weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Geometrical Laws of light: Reflection, Refraction and their application and techniques.**	**The student is able to understand the given material**	**10hours**	**2 weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Geometrical Optics: Huygens' Principle and Fermat's principle.**	**The student is able to understand the given material**	**10hours**	**2weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Principle of Reversibility, Reflection in Plane Mirrors, Refraction Through Plane Surfaces.**	**The student is able to understand the given material**	**10hours**	**2weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Imaging by an Optical System**	**The student is able to understand the given material**	**10hours**	**2weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Reflection at a Spherical Surface, Refraction at a Spherical Surface.**	**The student is able to understand the given material**	**10hours**	**2weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Thin Lenses, Newtonian Equation for the Thin Lens**	**The student is able to understand the given material**	**10hours**	**2weeks**

Quarterly and daily attendance exams	**In-person lectures**	**Optical Instrumentation: Prisms, The Camera, Microscopes, Telescopes.**	**The student is able to understand the given material**	**10hours**	**2weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Wave Equations: One-Dimensional Wave Equation, Harmonic Waves, Plane Waves, Spherical Waves.**	**The student is able to understand the given material**	**10hours**	**2weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Superposition of Waves, Superposition Principle.**	**The student is able to understand the given material**	**10hours**	**2weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Random and Coherent Sources, Standing Waves.**	**The student is able to understand the given material**	**10hours**	**2weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Optics of the Eye, Biological Structure of the Eye, Functions of the eye**	**The student is able to understand the given material**	**10hours**	**2weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Vision Correction with External Lenses, Surgical Vision Correction.**	**The student is able to understand the given material**	**10hours**	**2weeks**

Quarterly and daily attendance exams	**In-person lectures**	**Optical Properties of Materials, Propagation of Light Waves.**	**The student is able to understand the given material**	**10hours**	**2weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Fiber Optics, Applications, medical application.**	**The student is able to understand the given material**	**10hours**	**2weeks**

Course evaluation .2

Distributing a score out of 100 based on members' choices, such as attendance, daily attendance, monthly exams, reports, etc.

Learning and teaching resources .1 .20

• FRANK L. PEDROTTI, S.J., LENO M. PEDROTTI, LENO S. PEDROTTI , “Introduction to optics”, third edition,.	in references (sources)
F.A Jenkins and H.E. White, “Fundamentals of Optics”;-Mc. grow-Hill prim 1Custom publishing, 2001.	Recommended supporting books and references .(scientific journals)
https://sciences-library.blogspot.com/2018/03/Book-of-Optics-pdf.html?m=1	ctronic references, Internet sites

Course description form

1- Course name	**Astronomy**
2- Course code	
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**(2 hours per week * 30 60Hours weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name: Ahmed M. Hameed ahmediraq427@gmail.com

Course objectives .25

1- The student learns the basics of astronomy. 2- The student learns the basics of celestial mechanics. 3- The student gets to know the physical and kinetic properties of the solar system. 4- The student should know the physical and motion characteristics of stars and their types 5- The student learns about the types of galaxies, their physical properties, and the birth of the universe and its physical properties.		Objectives of the study subject

Teaching and learning strategies .11

1. In-person lectures in classrooms. **2. Discussion method, surprise exams, and methods of refining skills.** **Asking intellectual questions or holding a competition between students, stimulating creative 3 .thinking and answering clearly and quickly to the problems presented**	e strategy

Course structure .1 .21

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**Kepler's laws, dome Celestial bodies, astronomical terms, celestial**	**The student is able to understand the given material**	**10hours**	**weeks 5**

		dome coordinate systems			
Quarterly and daily attendance exams	**In-person lectures**	**Astronomical seasons, units of measurement, physical properties of the sun and its layers, surface phenomena of the sun and moon, physical properties of the planets**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Meteors, meteorites, and comets, the origin of the solar system, the steller Magnitude- the luminosity of the stars, the (H-R) diagram. For the stars and matters**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Steller Evolution, binary stars - measuring the mass of two stars, types of binary stars - variable stars, our Milky Way galaxy**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Galaxy movement, galaxy mass calculation, types of galaxies, active galaxies.**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Quasars - expansion of the universe, theory of the emergence of the universe,**	**The student is able to understand the given material**	**10hours**	**5weeks**

		life in the universe			

Course evaluation .2

*** Semi-daily and monthly tests**
And surprise exams.
Daily class participation

Learning and teaching resources .1 .22

فيزياء الجو و الفضاء : الجزء الاول (علم الفلك) – حميد مجول النعيمي وفياض النجم **- Fundamental Astronomy 5th ed** 2 **H.Karttunen,etal ; Springer- 2006.** 3- **Astronomy – Principles and Practice 4th ed, A. Roy,D Clarke; Springer.**	in references (sources)
	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

1- Course name	Electricity and Magnetism II
2- Course code	PH 201
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**Hours 60 (2 hours per week * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name: Wisam Roise

Course objectives .26

- Introducing the student to the causes and effects of electric current and the electromagnetic field resulting from electric current. - Introducing older children to electrical measuring devices. - Introducing the student to methods for generating a magnetic field through the passage of electrons. - A basic overview of alternating electric currents and their application circuits. - Introducing the student to the laws of electromagnetic induction (Faraday + Biot-Savart + Ampere's Law). - Introducing the student to the concepts of self-induction and commutation.		Objectives of the study subject

Teaching and learning strategies .12

- In-person lectures at academic universities. **- Discussion and examination methods, advanced techniques, and cutting-edge technologies.** **- Pose new or innovative questions, encourage students to compete, stimulate creative thinking, and provide clear and rapid answers to the presented questions.** **- Advanced thinking methods (assuming design hypotheses)** **- Consolidating understanding of the basic concepts of alternating or direct current electrical currents and some of their applied units.** **- Identify the mathematical tools used in Faraday, Biot-Savart, and Ampere-Rhin's law.**	The strategy

Course structure .1 .23

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	In-person lectures	Alternating Current	The student should know electric current and some of its applied units.	8 hours	4 week
Quarterly and daily attendance exams	In-person lectures	Magnetic Field	The student should know the mathematical properties of the magnetic field.	8 hours	4 week
Quarterly and daily attendance exams	In-person lectures	Electrical Measuring Instruments	The student should know some electrical measuring devices.	4 hours	4 week
Monthly Exam					
Quarterly and daily attendance exams	In-person lectures	Magnetic field of electric current	Introducing the student to the magnetic field of an electric current.	8 hours	4 week
Quarterly and daily attendance exams	In-person lectures	induced electromotive force	Introducing the student to electric current and some of its applied units.	8 hours	4 week
Quarterly and daily attendance exams	In-person lectures	Inductance	Introducing the student to induced electromotive force.	8 hours	4 week
Quarterly and daily attendance exams	In-person lectures	Electric current	Introducing the student to the laws of self- and reciprocal search.	8 hours	4 week
Monthly Exam					

Quarterly and daily attendance exams	**In-person lectures**	**Magnetic and ferromagnetic properties of materials**	**Introducing the student to the magnetic and ferromagnetic properties of materials**	**8 hours**	**2 week**

Course evaluation .2	
Distributing a score out of 100 based on members' choices, such as attendance, daily attendance, monthly exams, reports, etc.	
Learning and teaching resources .1 .24	
.Kip, Arthur F., "Fundamentals of Electricity and Magnetism, 2nd Ed.", McGraw-Hill, 1969 Scott, W. T., The Physics of Electricity and Magnetism, Wiley, 1959	in references (sources)
	Recommended supporting books and references .(scientific journals)

Course Description Form

27. Course Name:	**Mathematics (second grade)**
28. Semester / Year:	Annual
29. Description Preparation Date:	2023-2024
30. Available Attendance Forms:	Lectures are delivered to students in person according to the schedule announced in the department
31. Number of Credit Hours (Total) / Number of Units (Total)	90 hours, (3 hours per week *30 per week) 6 units
32. Course administrator's name (mention all, if more than one name)	Name: Assis. prof. D. Akeel A. Qasim Email: akeelmath@uomisan.edu.iq
33. Course Objectives	
Course Objectives	* Introduce students to the concept of finite and infinite sequences and series, the degree of convergence or divergence of their elements, and study a number of mathematical methods for testing convergence that can be used as a basis for third grade. * Introduce students to the concept of power series and expand this concept to identify new series such as Taylor series, test their convergence, and study how to calculate logarithmic and trigonometric functions. * An extended and complementary study of the first stage regarding vectors and parametric equations. * Expanding students' understanding of the derivative and its generalization to functions of two variables, and finding partial and implicit derivatives by applying the chain rule. * Studying first-order differential equations and their solution methods (separation of elements, homogeneous equations, etc.) * Studying second-order differential equations and introducing some special types of these equations, as well as studying some solution methods.
34. Teaching and Learning Strategies	
Strategy	* In-person lectures in classrooms. * Discussion method, surprise exams, and methods of refining skills. * Asking intellectual questions or holding a competition between students, stimulating creative thinking and answering clearly and quickly to the problems presented.
35. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
5 weeks	15 hours	The student will be able to understand the given material,	Sequences, Series, and Points of Convergence	In person lectures	Semester and daily in-person exams.
4 weeks	12 hours	The student will be able to understand the given material	Power Series and Intervals of Convergence	In person lectures	Semester and daily in-person exams.
6 weeks	18 hours	The student will be able to understand the given material	Parametric Equations and Vectors in the Plane and Space	In person lectures	Semester and daily in-person exams.
4 weeks	12 hours	The student will be able to understand the given material,	Functions of Multiple Variables and Partial Derivatives	In person lectures	Semester and daily in-person exams.
5 weeks	15 hours	The student will be able to understand the given material,	Differential Equations of First Uncertainty and Solution Methods	In person lectures	Semester and daily in-person exams.
6 weeks	18 hours	The student will be able to understand the given material,	Differential Equations of Second Uncertainty and Solution Methods	In person lectures	Semester and daily in-person exams.

36. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
37. Learning and Teaching Resources	
Required textbooks (methodology, if available)	Calculus and Analytical Geometry by George Thomas, Seventh Edition.
Primary references (sources)	The First Cosine in Differential Equations by Dennis, Eighth Edition, 2005
Recommended supporting books and references (scientific journals, reports, etc.)	Advanced Calculus a geometric View "James J. allahan, 2010.
Electronic references, websites	Calculus A Complete Course, ninth edition "Robert A. dams"

Course description form

1- Course name	**Computer II**
2- Course code	
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**Hours 60 (2 hours per week * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name: Ali Atima **ali_ataeemh@uomisan.edu.iq**

38. Course objectives

1. Provide students with basic knowledge of computer components and Matlab. 2. Introduce students to programming concepts using Matlab. 3. Develop students' skills in using computers as a tool for analyzing physical data and solving scientific problems using Matlab. 4. Prepare students to use computer technologies in advanced studies, scientific research, and graphic design using Matlab.		Objectives of the study subject

Teaching and learning strategies .13

1. In-person lectures in classrooms. **2. In-person lectures in computer labs.** **3. Discussion methods, surprise exams, and skill-building methods.** **4. Posing intellectual questions or holding competitions among students, stimulating creative .thinking, and providing clear and prompt answers to problems.**	The strategy

Course structure .1 .25

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**Introduction to MATLAB, the work environment, how to open and write commands**	**The student is able to understand the given material**	**10 hours**	**weeks 5**

Quarterly and daily attendance exams	**In-person lectures**	**Variables, data types, arrays, and how to manipulate them**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Conditional statements (if - else) and loops (for - while)**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Writing functions and using built-in functions**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Creating graphs and analyzing data, educational and scientific applications using MATLAB (grade analysis, drawing educational charts)**	**The student is able to understand the given material**	**10hours**	**5weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Educational and scientific applications using MATLAB (grade analysis, drawing educational charts)**	**The student is able to understand the given material**	**10hours**	**5weeks**

Course evaluation .2

*** Semi-daily and monthly tests, surprise exams, daily class participation, and computer-based tests.**

Learning and teaching resources .1 .26

"MATLAB: A Practical Introduction to Programming and Problem Solving" – Stormy Attaway, Elsevier.	in references (sources)
	Recommended supporting books and references .(scientific journals)
MathWorks: https://www.mathworks.com/help/matlab/	ctronic references, Internet sites

Course description form

1- Course name	**Sound and Wave Motion**
2- Course code	PH 204
3- Semester/Year	annual
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	90 hours, (3 hours per week * 30 weeks)
7- Name of the course administrator (if more than one name is mentioned	Name: Prof. Dr. Younis Mohamed Attia **younisal_zahy72@yahoo.co.uk**

Course objectives .39

- Students will learn about the subject of sound and wave - motion and their importance in physics. - Students will apply the knowledge they acquire to explain natural phenomena related to sound and wave motion. - Students will gain the thinking skills necessary to use in teaching sound and wave motion when practicing their specialties as teachers in elementary, middle, and secondary schools, as part of the science or physics curriculum. - Students will gain scientific research skills for use in research and applied fields within government departments involved in research.		Objectives of the study subject

Teaching and learning strategies .14

- In-person lectures in classrooms. **- Discussion, pop-up exams, and skill-building techniques.** **- Posing intellectual questions or holding competitions among students, stimulating creative thinking and providing clear and rapid answers to problems.** **- Practicing advanced thinking methods (hypothesizing and deduction).** **- Consolidating understanding of the basic ideas in quantum mechanics. Identifying the mathematical tools used in sound and wave motion.** **- Applying acquired skills to solve real quantitative sentences.** **- Understanding and using methods of calculations using sound and wave motion.**	The strategy

Course structure .1 .27

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	In-person lectures	(Definition of sound, psychological and physical meaning of sound, conditions for sound occurrence and propagation) Chapter Two (Vibrational motion, simple harmonic motion, applications of simple harmonic motion)	Knowledge related to: the nature of sound, the conditions of its occurrence and transmission, free vibration, simple harmonic motion, and its applications.	3 hours	15
Quarterly and daily attendance exams	In-person lectures	Superposition) principle, superposition of two harmonic motions in one dimension, superposition of two harmonic motions in two perpendicular dimensions, applications using MATLAB*)	Knowledge related to: the principle of superposition and its types.	6 hours	15
Quarterly and daily attendance exams	In-person lectures	Forces causing decay of vibrations, equation of decayed harmonic motion, types of decayed harmonic motion, applications	Knowledge related to: decayed vibrations.	3 hours	15

		using MATLAB*)			
Quarterly and daily attendance exams	**In-person lectures**	**Forced) vibration, equation of forced vibration, resonance, practical applications of resonance, applications using MATLAB*)**	**Knowledge related to: forced vibration and resonance.**	**6 hours**	**15**

Course evaluation .2

Distributing a grade out of 100 based on what the student decides, such as attendance, daily attendance, monthly reports, reports, etc.

Learning and teaching resources .1 .28

. الكتاب المقرر: فيزياء الصوت والحركة الموجية، امجد عبد الرزاق كرجية، جامعة الموصل، الطبعة الثانية، 0222 :أخرى 1-THE PHYSICS OF VIBRATIONS AND WAVES, H. J. Pan, Sixth Edition, John Wiley & Sons, 2005. 2- Vibrations and Waves, George C. King, WILEY, 2009.	Main references (sources)
	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

1- Course name	**Educational Administration and Secondary Education**
2- Course code	
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**Hours 60 (2 hours per week * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	

40. Course objectives

1- Preparing a future teacher capable of teaching and communicating with students in person and online. 2- Preparing a teacher capable of handling classroom problems and finding solutions. 3- Emphasizing the study of administrative concepts related to administrative and educational work. 4- Introducing students to the importance of management in the field of education. 5- Enabling students to manage classrooms effectively using modern teaching methods and techniques.		Objectives of the study subject

Teaching and learning strategies .15

1- In-person lectures in classrooms. **2- Discussion methods, surprise exams, and skill-building techniques.** **3- Pose intellectual questions or conduct competitions among students, stimulate creative thinking, and provide clear and prompt answers to emerging issues.**	The strategy

Course structure .1 .29

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**Administration - Concept, Origins, and Historical Development**	**The student is able to understand the given material**	**8 hours**	**4 Week**

Quarterly and daily attendance exams	**In-person lectures**	**Levels of Administration in Education**	**The student is able to understand the given material**	**8 hours**	**4 Week**
Quarterly and daily attendance exams	**In-person lectures**	**Centralized and Decentralized Administration - Types**	**The student is able to understand the given material**	**8 hours**	**4 Week**
Quarterly and daily attendance exams	**In-person lectures**	**Educational, Teaching, and School Administration**	**The student is able to understand the given material**	**8 hours**	**4 Week**
Quarterly and daily attendance exams	**In-person lectures**	**Classroom Management - Concept and Everything Related to the Topic**	**The student is able to understand the given material**	**8 hours**	**4 Week**
Quarterly and daily attendance exams	**In-person lectures**	**Functions, Methods, and Patterns in Administration**	**The student is able to understand the given material**	**8 hours**	**4 Week**
Quarterly and daily attendance exams	**In-person lectures**	**Educational Supervision in All Its Details**	**The student is able to understand the given material**	**12 hours**	**4 Week**

Course evaluation .2

*** Semi-daily and monthly tests, surprise exams, daily class participation, and computer-based tests.**

Learning and teaching resources .1 .30

The Book of Administration, Supervision, and Secondary Education - Alaa Hakim Al-Nasser 2312	in references (sources)
Secondary Education and Administration Book - Sami Abdel Fattah Raouf (2323) School Applications	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

Developmental psychology	Course name .1
	:Course code .1
annual	:Semester/Year .1
2024/2025	Date this description was .1 prepared:
Lectures are delivered to students in person according to the schedule announced in the department	:Available forms of attendance .1
(2 hours per week * 30 weeks) 60hours	Number of study hours .1 (total)/number of units (total)
	Name of the course .1 administrator (if more than one name is mentioned)

Course objectives .41

1-Know the concept of developmental psychology 2_ Explaining the stages of linguistic development 3_Know the stages of human cognitive development 4_ Know the stages of human development 5_ Distinguish between the branches of developmental psychology	Objectives of the study subject

Teaching and learning strategies .16

1. In-person lectures in classrooms. **2. Discussion method, surprise exams, and methods of refining skills.** **Asking intellectual questions or holding a competition between students, stimulating .3 .creative thinking and answering clearly and quickly to the problems presented**	**strategy**

Course structure .1 .31

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week

Quarterly and daily attendance exams	**In-person lectures**	**Developmental . psychology, its definition and importance. Meaning of growth. Laws of ……growth**	**The student is able to understand the given material**	**10hours**	**5 Weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Factors affecting growth, genetic factors, environmental …factors**	**The student is able to understand the given material**	10hours	**5 Weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Research methods in developmental psychology, methods of collecting information..**	**The student is able to understand the given material**	**10hours**	**5 Weeks**
Quarterly and daily attendance exams	**In-person lectures**	**The stage of childhood: its definition, importance, stages, physical growth, mental development, emotional development, sensory …development**	**The student is able to understand the given material**	**10hours**	**5 Weeks**
Quarterly and daily attendance exams	**In-person lectures**	**The role of social institutions in the socialization of the child, family, school, peers, and the media.**	**The student is able to understand the given material**	**10hours**	**5 Weeks**
Quarterly and daily attendance exams	**In-person lectures**	**Adolescence, its definition, importance, stages, physical growth, mental development,**	**The student is able to understand the given material**	**10hours**	**5weeks**

		cognitive and moral development			

Course evaluation .2 .32

* **Semi-daily and monthly tests**

And surprise exams.

Daily class participation

Learning and teaching resources .3

. - Childhood and Adolescent Psychology, Al-Alusi; Jamal Hussein (1983), Baghdad - University of Baghdad. - Evolutionary Psychology; Arifaj, Sami, (1993) Jordan_Amman, Majdalawi Publishing House. - Introduction to developmental psychology, Alwan, Fadia (2003), Cairo - Arab House Library. -The psychology of development. Al-Anani, Hanan Abdel Hamid (2003)	Required textbooks (methodology, if any)
	Main references (sources)
	Recommended supporting books and . …references (scientific journals, reports
	Electronic references, Internet sites

Course description form

1- Course name	**Scientific research methodology**
2- Course code	
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	***90 hours, (3 hours per week *30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	

42. Course objectives

1. Teach students that the progress of societies is dependent on the progress of scientific research. 2. Teach students the principles of scientific research, its methods, and the types of scientific research used. 3. Teach students how to choose a research topic—that is, how to use the principles of scientific research to solve the educational, psychological, and social problems surrounding it. 4. Teach students how to use appropriate tools to collect the information needed for scientific research. 5. Teach students how to use the principles of statistics to quantify the psychological phenomena studied by scientific research. 6. Teach students how to interpret and analyze the results that scientific research can reach.		Objectives of the study subject

Teaching and learning strategies .17

- In-person lectures in classrooms. **- Discussion methods, surprise exams, and skill-building techniques.** **- Posing intellectual questions or holding competitions among students, stimulating creative thinking and providing clear and prompt answers to emerging problems.** **- Assigning students to extracurricular activities that can hone their scientific research skills.**	The strategy

Course structure .1 .33

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	In-person lectures	Introduction to scientific research, its methods, and definition of basic research terms and concepts.	The student is able to understand the given material	8 hours	5 Week
Quarterly and daily attendance exams	In-person lectures	Types of research (basic and applied) Scientific -* research methods (descriptive, historical, experimental)	The student is able to understand the given material	8 hours	5 Week
Quarterly and daily attendance exams	In-person lectures	Samples in Scientific Research Measurement -* Tools in Scientific Research	The student is able to understand the given material	8 hours	5 Week
Quarterly and daily attendance exams	In-person lectures	Using statistics in scientific research. Analyzing -* results in scientific research.	The student is able to understand the given material	8 hours	5 Week
Quarterly and daily attendance exams	In-person lectures	Methods of recording information in scientific research.	The student is able to understand the given material	8 hours	5 Week
Quarterly and daily attendance exams	In-person lectures	Sources, appendices, and tables in scientific research Writing a -* research plan	The student is able to understand the given material	8 hours	5 Week
Course evaluation .2					
* Semi-daily and monthly tests and surprise exams. - Extracurricular activities, such as student preparation of reports and presentation in class. - Assigning students library assignments, such as using sources, research, previous studies, and library indexing.					

Learning and teaching resources .1 .34	
Scientific Research Methods and Statistical Analysis, Ikhlas Muhammad and Mustafa Bahi, 1999. Scientific Research Methodology, Hussein Muhammad Jawad, 2013. Scientific Research Methods, Kazem Al-Jaberi and Wadud Abdul Salam, 2015.	in references (sources)
Scientific Research Methods / Van Dalen Psychological Evaluation / Fouad Abu Hatab 1976	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

1- Course name	**Atomic and molecular**
2- Course code	
3- Semester/Year	annual
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	90 hours (3 hours per week x 30 weeks)
7- Name of the course administrator (if more than one name is mentioned	Name: Dr. Haider Ahmed Hasan

Course objectives .43

General objective: To introduce students to the - fundamentals of atomic physics. Specific objective: To introduce students to modern physics, such as the special theory of relativity, theories of atomic structure, X-rays, and matter waves. This course also aims to integrate physical concepts, laws, and mathematical derivations, and to broaden students' horizons toward scientific theories and their applications.		Objectives of the study subject

Teaching and learning strategies .18

1. In-person lectures in classrooms. **2. Discussion methods, surprise exams, and skill-building techniques.** **3. Posing intellectual questions or holding competitions among students, stimulating creative thinking, and providing clear and prompt answers to problems.** **4. Practicing advanced thinking methods (hypothesizing and deduction).**	The strategy

Course structure .1 .35

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**The Theory of Special Relativity Newton's Laws of Motion Galileo's Transformations**	**What is atomic physics? Introduction to relativity. Inertial axes.**	**12**	**4**

		Newton's Principle of Relativity Michelson-Morley Experiment Postulates of the Theory of Special Relativity Lorentz Transformations			
Quarterly and daily attendance exams	**In-person lectures**	**Lorentz transformation results: Relativity of length, Relativity of time, Relativity of velocity. Relativity of mass. Relativity of force. Relativity of energy. Relativity of energy and momentum. Electron volts. Relativity of force. Relativity of energy and momentum. Electron volts.**	**The student should know the topics**	**15**	**5**
Quarterly and daily attendance exams	**In-person lectures**	**The nature of light and electromagnetic radiation. Thermal radiation. Emission and absorption of radiation. Blackbody radiation. Blackbody radiation spectrum.**	**The student should know the topics**	**12**	**4**

		Rayleigh-Jeans law. Planck's law of radiation. The photoelectric effect. Einstein's explanation of the photoelectric effect.			
Quarterly and daily attendance exams	**In-person lectures**	**Applications of the photoelectric effect. Solved problems. Discovery of natural radioactivity. Atomic models: Thomson's model, Rutherford's model. Rutherford's scattering theory. Solved problems.**	**The student should know the topics**	**12**	**4**
Quarterly and daily attendance exams	**In-person lectures**	**Discovery of X-rays. Production of X-rays. Measurement of X-ray intensity. X-ray spectra: Continuous X-ray spectrum, Sharp line X-ray spectrum. Nature and diffraction of X-rays. Refraction of X-rays. Compton effect. Pair production.**	**The student should know the topics**	**15**	**5**
Quarterly and daily attendance exams	**In-person lectures**	**Photon absorption. Questions. Solved problems. De Broglie hypothesis.**	**The student should know the topics**	**12**	**4**

		Electron diffraction. Neutron diffraction. What are de Broglie waves? De Broglie wave velocity. Phase velocity and group velocity. Double-slit experiment. Uncertainty principle. Questions. Solved problems.			
Quarterly and daily attendance exams	**In-person lectures**	**Introduction, Hydrogen Atom Spectrum Bohr's Theory of the Hydrogen Atom, Deriving the Binding Energy of the Hydrogen Atom Finding the Angular Velocity of the Electron, Bohr's Postulates**	**The student should know the topics**	**6**	**2**
Quarterly and daily attendance exams	**In-person lectures**	**To interpret the spectrum of a hydrogen atom Derive the wavenumber equation using Bohr's second postulate, electron transitions in a hydrogen atom Motion of the hydrogen nucleus**	**The student should know the topics**	**6**	**2**
Course evaluation .2					

Semi-daily and monthly tests, surprise exams, and daily classroom participation.

Learning and teaching resources .1 .36	
Fundamentals of Physics, by F. Bush, translated from the 1977 edition. Atomic Physics, by Dr. Talib Nahi Al-Khafaji, Dr. Abbas Hammadi, and Dr. Hormuz Moshi. Concepts in Modern Physics, by Arthur Beiser, translated from the second edition.	Main references (sources)
	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

1- Course name	**Thermodynamics**
2- Course code	PH 302
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**150hours, (3 hours of theory and 2 hours of practical work per week) (5 hours * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name: Ahmed Shihab

Course objectives .44

The student will understand the meaning of thermodynamics, the system, the types of systems and their properties. The student will understand thermodynamic processes, reversible and irreversible processes, and thermodynamic equilibrium. He will understand the zeroth law, the equation of state for an ideal gas, and the equations of state for real gases. He will understand the first and second laws of thermodynamics, the meaning of enthalpy, heat capacity, work done, and the Carnot cycle. The student will understand the concept of entropy, Maxwell-Boltzmann statistics, Fermi-Dirac statistics, and Bose-Einstein statistics.		Objectives of the study subject

Teaching and learning strategies .19

1- In-person lectures in classrooms. **2- Discussion methods, surprise exams, and skill-building techniques.** **3- Pose intellectual questions or conduct competitions among students, stimulate creative .thinking, and provide clear and prompt answers to emerging issues.**	The strategy

Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week

Quarterly and daily attendance exams	**In-person lectures**	**The meaning of thermodynamics, definition of the system and its types (real and ideal system), limits of the system (open, closed and isolated), processes in thermodynamics, thermodynamic equilibrium, properties of the system, the relationship between heat and work, zeroth law.**	**The student should understand the meaning of thermodynamics and the basic concepts of the system.**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**The equation of state for an ideal gas and its empirical derivation, the equation of state for a real gas, the equation of state for a van der Waals gas and finding its constants, partial derivatives, the state function and its conditions, the path function, expansion and compressibility**	**Equations of state for ideal and real gases and some useful mathematical theorems**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Text of the first law, formula of the first law, applications of the first law, results of the first law, meaning of enthalpy, free**	**The student should understand the first law of thermodynamics, the meaning of enthalpy, gas expansion, heat**	**15 hours**	**5 week**

		expansion of gases, true expansion of gases, work done in adiabatic, isothermal and constant-volume processes, gas work in constant-temperature processes, heat capacity under constant pressure and heat capacity under constant volume and the relationship between them, concept of work in thermodynamics, dependence of work on path	**capacity, the concept of work, and its dependence on the path.**		
Quarterly and daily attendance exams	**In-person lectures**	**Text of the second law, formulations of the second law (Calasius, Kelvin-Planck), linking the first law and the second law on this link and the results arising when applied to an ideal gas, Carnot cycle machine, representation of the Carnot cycle, heat engines and their cycle and efficiency, heat pump and its operation and efficiency**	**The student should understand the second law of thermodynamics and its connection to the first law, the results of this connection, the Carnot cycle machine, the heat engine, and the heat pump.**	**15 hours**	**5 week**

Quarterly and daily attendance exams	**In-person lectures**	**Definition of entropy (inertia), calculation of entropy change, principle of entropy increase in the universe and system, relationship between entropy and temperature, Claesius theory, Gibbs function, Helmholtz function, thermodynamic potential equations, Maxwell's equations**	**The student should understand entropy and its relationship with the system and the universe, the Clausius theory, and some functions and equations related to entropy and temperature.**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Kinetic theory of gases, basic principles of kinetic theory, translational phenomena, mean free path, diffusion phenomenon, viscosity phenomenon, thermal conductivity phenomenon, probability, Maxwell-Boltzmann statistics, Fermi-Dirac statistics, Bose-Einstein statistics**	**The student understands and records the basic principles of the kinetic theory of gases and statics.**	**15 hours**	**5 week**
Course evaluation .2					

*** Semi-daily and monthly tests** **And surprise exams.** **Daily class participation**	
Learning and teaching resources .1 .37	
	in references (sources)
	Recommended supporting books and references .(scientific journals)
	ctronic references, Internet sites

Course description form

ELECTRONICS	Course name .45
Ph307	:Course code .46
annual	:Semester/year .47
2024 /2023	The date this description was .48 :prepared
Lectures are delivered to students in person according to the schedule announced in the department	:Available attendance forms .49
90 hours (3 hours per week ×30 per week)	Number of study hours .50 ((total)/number of units (total
Name: Dr. Mohammed Salim Jasim Msjadr72@gmail.com	Name of the course .51 administrator (if more than one (name is mentioned

Course objectives .52

✓ Introducing the students to the subject of electronics physics and giving the students a basic overview of the diode in electrical circuits and explaining its importance and how to benefit from it and avoid the dangers resulting from it and its role in understanding the principles of modern physics and its daily uses and how to employ this knowledge in confronting daily life .developments in the field of modern technologies		Objectives of the study subject
✓ It makes students of colleges of education for pure sciences feel the value and importance of physics and the role of semiconductor materials in science and technology, especially in the field of towers, communications and mobile phones, and how .they deal with students		
✓ Schools after graduation and practice their specialties as teachers in middle and middle schools and some research laboratories in state departments related to industry and in the field .of research and development		

Teaching and learning strategies .1 .20

.In-person lectures in classrooms .38 **.Discussion method, surprise exams, and methods of refining skills .39** **Asking intellectual questions or holding a competition between students, stimulating creative .40 .thinking and answering clearly and quickly to the problems presented** **Cognitive objectives .41** **The student should know the foundations of electronics and the fields of use .42** **Introducing students to the types of materials and mainly paying attention to semiconductors .43** **The student should know how the process of mixing is done .44** **.The student should know the process of creating and designing a diode .45**	**The strategy**

.The student should know how the process of connecting a diode is done .46 The student will know how to analyze complex electrical networks through Kirchhoff's laws as well as using Thevenin's theory .47 Course-specific skills objectives .48 How to perform mathematical operations on electronic circuits and employ their theories through scientific thinking .49	

Course structure .50

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	Week
Quarterly and daily attendance exams	In-person lectures	Materials in nature	The student should know the types of materials and rely on the energy gap to distinguish between them	12	4
Quarterly and daily attendance exams	In-person lectures	Identify silicon and germanium	The student should know the importance of semiconductors and their types	51	5
Quarterly and daily attendance exams	In-person lectures	Through heat and quenching, the quenching process takes place	To know the types of semiconductors and how they are catalyzed	12	4
Quarterly and daily attendance exams	In-person lectures	Electrical energy stored in doped semiconductors	Student definition of potential energy in doped semiconductors	12	4
Quarterly and daily attendance exams	In-person lectures	electric current	The student defines the nature of the current and the density of the current	15	5
Quarterly and daily attendance exams	In-person lectures	Holes and electrons	Introducing the student to diodes and their importance in electronic circuits	12	4
Quarterly and daily attendance exams	In-person lectures	Kirchhof and Thevenin	Introducing the student to Kirchhoff's laws and Thevenin's laws in analyzing and simplifying electronic networks	6	2

Quarterly and daily attendance exams	**In-person lectures**	**complex electronics**	**Analyzing complex electrical networks in the simplest possible ways**	**6**	**2**
Course evaluation .51					
Semi-daily and monthly tests **.And surprise exams** **Daily class participation**					
Learning and teaching resources .52					
Electronics basics .53 **Basics of electrical theory - .54** **Basics of electronic circuits - .55** **56. - Schaum Abstracts Series: Electrical 2000 (written by Joseph Edmonds)**					

Course description form

1- Course name	**Analytical Mechanics**
2- Course code	**PH 301**
3- Semester/Year	annual
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	150hours (3 hours of theory and) (5 hours * 30 weeks)
7- Name of the course administrator (if more than one name is mentioned	Name: Prof. Dr. Younis Mohamed Attia **younisal_zahy72@yahoo.co.uk**

Course objectives .53

The objective of the course is to introduce students to the - methods of analytical mechanics and develop the mathematical skills required to solve problems in analytical mechanics, dynamics, and other areas of theoretical physics. Students will also gain an understanding of the important theoretical mathematical derivations needed to explain various mechanical kinetic phenomena.	Objectives of the study subject

Teaching and learning strategies .21

1. In-person lectures in classrooms. **2. Discussion methods, surprise exams, and skill-building techniques.** **3. Posing intellectual questions or holding competitions among students, stimulating creative thinking, and providing clear and prompt answers to emerging issues.**	The strategy

Course structure .1 .57

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**Introduction to vectors, their analysis and importance**	**Introducing the student to vector analysis and its importance. Basics of vector concepts.**	**9 hours**	**1,2,3**

Quarterly and daily attendance exams	**In-person lectures**	**Basics of vector concepts**	**Introducing the student to vector units, magnitude, scalar and cross product of vectors, their properties and uses.**	**9 hours**	**4,5,6,**
Quarterly and daily attendance exams	**In-person lectures**	**Fundamentals of vector concepts, particle dynamics, and vector differentiation and integration**	**Introducing the student to differentiation and integration of vectors, their properties and uses**	**9 hours**	**7,8,9**
Quarterly and daily attendance exams	**In-person lectures**	**Differentiation and integration of vectors, velocity and acceleration of particles in polar, cylindrical and spherical coordinates**	**Introducing the student to differentiation and integration of vectors, their properties and uses**	**12 hours**	**10,11,12,13**
Quarterly and daily attendance exams	**In-person lectures**	**Kinetics of particles in straight line motion**	**Recognizing movement in a straight line**	**3 hours**	**14**
Quarterly and daily attendance exams	**In-person lectures**	**Potential and kinetic energy, the law of conservation of energy, and the conditions for conservation of force**	**Identify potential and kinetic energy and the law of conservation of energy.**	**3 hours**	**15,16**
Quarterly and daily attendance exams	**In-person lectures**	**Understanding and comprehending the derivations of the motion of a body in a resistive medium, finding the final velocity, and the**	**Introducing the student to vertical motion in a resistive medium, terminal velocity, and the change in**	**6 hours**	**17,18**

		change in gravity with height.	**gravity with height.**		
Quarterly and daily attendance exams	**In-person lectures**	**Physical applications of simple harmonic motion**	**Linear drag force, harmonic motion and their applications**	**6 hours**	**19,20**
Quarterly and daily attendance exams	**In-person lectures**	**Physical applications of simple harmonic motion**	**Introducing the student to the kinematics of a particle in general motion, the principle of work, conservative forces, and force fields.**	**6 hours**	**21,22,23**
Quarterly and daily attendance exams	**In-person lectures**	**Finding the potential energy function of a particle and the gradient, divergence, and twist of vectors**	**Introducing students to how to find the potential and kinetic energy of particles and force as a function of velocity, position, and time, each separately, and the conditions for conservation of force.**	**6 hours**	**24,25,26**
Quarterly and daily attendance exams	**In-person lectures**	**Equations of motion of projectiles in a uniform gravitational field**	**Student definition of projectile motion in a uniform gravitational field and various solved problems**	**6 hours**	**27**

Quarterly and daily attendance exams	**In-person lectures**	**Derivatives of motion in a harmonic oscillator in two and three dimensions**	**Student definition of harmonic oscillator in two and three dimensions**	**6 hours**	**28**
Quarterly and daily attendance exams	**In-person lectures**	**Motion on a curve and the simple pendulum**	**Student definition of harmonic oscillator in two and three dimensions**	**6 hours**	**29,30**

Course evaluation .2

Distributing a grade out of 100 based on what the student decides, such as attendance, daily attendance, monthly reports, reports, etc.

Learning and teaching resources .1 .58

Classical Mechanics, by H. GOLDSTE	Main references (sources)
	Recommended supporting books and references .(scientific journals)
http://ocw.mit.edu/courses/analytical mechanics/	ctronic references, Internet sites

Course description form

1- Course name	**Complex Functions**
2- Course code	PHCF 325
3- Semester/Year	1st and 2nd semester/ 3rd Year
Date this description was prepared	**2023-2024**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**(2 hours per week * 30 weeks) Hours 60**
7- Name of the course administrator (if more than one name is mentioned	Name: Safwat Chiad Jary Safwat.cj@gmail.com

8- Course objectives

Qualifying and training the student and teaching him on complex numbers, complex functions and their properties, complex integration, sequences, physical applications and the employment of functions in the service of other school subjects.	Objectives of the study subject

Teaching and learning strategies

1. In-person lectures in classrooms. **2. Discussion method, surprise exams, and methods of refining skills.** **Asking intellectual questions or holding a competition between students, stimulating 3** **.creative thinking and answering clearly and quickly to the problems presented**	The strategy

54. Course structure

Weeks	Hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
1-5	10	Gaining knowledge in complex numbers and their properties	،Preface, the complex number Exercises, attributes ،Algebra, exercises ،Absolute value Exercises, acting	Lecture and Discussion	Quarterly and daily attendance exams

			The geometry of the complex ،number ،Polar coordinates Exercises, Powers And roots, exercises		
6-10	10	Gaining knowledge in complex functions and their properties	Functions of a complex ،variable exercises, Limits, exercises, ،Continuity exercises, Derivatives, exercises, Analytic functions, Harmonics functions, exercises	Lecture and Discussion	Quarterly and daily attendance exams
11-15	10	Gaining knowledge in elementary complex functions and their properties	Exponential function, the Logarithmic function, exercises, Trigonometric functions, Inverse trigonometry functions, Hyperbolic functions, Inverse Hyperbolic functions, exercises	Lecture and Discussion	Quarterly and daily attendance exams
16-20	**10**	Gaining knowledge in complex integration and their properties and theorems	Paths , complex integration, exercises, Cauchy- Goursat's theorem, generalization of Cauchy- Goursat's theorem to a multi-contact area, indefinite integrals, exercises, Cauchy integral formulas, Liouville's theorem, Moreira's theorem, the fundamental theorem in Algebra, the Gauss mean value theorem, exercises	Lecture and Discussion	Quarterly and daily attendance exams
21-25	**10**	Gaining knowledge in complex series	Convergence of sequences and series, exercises, power series, exercises, Taylor series, exercises, Laurent series, exercises	Lecture and Discussion	Quarterly and daily attendance exams
26-30	**10**	Gain knowledge in the treatment of the most important physical applications	Applications on electrostatics, exercises, applications on the flow of heat, exercises	Lecture and Discussion	Quarterly and daily attendance exams
55. Course evaluation					

* **Semi-daily and monthly tests** **And surprise exams.** **Daily class participation**	
Learning and teaching resources	
الدوال المعقدة للصف الثالث فيزياء في كليات التربية سمير بشير حديد، يحيى عبد سعيد	Main references (sources)
Complex analysis with applications, Asmar, Nakhle H., Grafkos, Loukas-Grafakos L., (2018) Springer	Recommended supporting books and references (scientific journals).
	Electronic references, Internet sites

Course description form

1- Course name	**Guidance and mental health**
2- Course code	
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**Hours 60 (2 hours per week * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name: Ghufran Khazal

Course objectives

1- Employing the subject of guidance, its principles, foundations, and methods to achieve psychological, educational, and social compatibility for College of Education students. 2- Activating the role of the guidance teacher and educational counselor to help students achieve psychological, educational, and social compatibility. 3- Guidance programs and their importance in addressing the problems facing students. Parent-Teacher Councils and their role in guidance.		Objectives of the study subject

Teaching and learning strategies

1- Classroom lectures. **2- Discussion and participation in presenting real-life examples for learning, as well as surprise weekly and semester exams.** **3- Writing reports based on the course content to encourage general reading and contribute to enhancing educational culture in the field of guidance.**	The strategy

Course structure .1 .59

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**Introduction to the concept of psychological**	**The student is able to**	**10 hours**	**5 week**

		guidance, justifications and objectives / Principles of guidance	**understand the given material.**		
Quarterly and daily attendance exams	**In-person lectures**	**The relationship between guidance and science / areas of guidance / therapeutic guidance / educational guidance**	**The student is able to understand the given material.**	**10 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Marital/vocational/ family/ children/ youth/adult/ exceptional counseling**	**The student is able to understand the given material.**	**10 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Guidance methods and foundations / philosophical, psychological and ethical / information necessary for the guidance process / means of collecting information**	**The student is able to understand the given material.**	**10 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Counseling theories / Psychoanalysis / Behavioral / Humanistic / Existential / Tests / Observation**	**The student is able to understand the given material.**	**10 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Guidance in school / Parent-Teacher Councils / The need for guidance programs / The problems it addresses**	**The student is able to understand the given material.**	**10 hours**	**5 week**
Course evaluation .2					

* Monitoring developments in recent studies. * Encouraging reading about curriculum vocabulary and analyzing some guidance programs. * Proposing ideas for future research projects on educational, psychological, and social issues, including behaviors alien to the educational community.	
Learning and teaching resources .1 .60	
(Theories of Counseling and Psychotherapy) Patterson, 1st ed., 1981 (Counseling and Mental Health) Sahib Abdul Marzouq, Hassan Ali Al-Sayed, 2011 Counseling and Mental Health / Fahim Hussein Al-Tuwaihi, Hussein Rabie Hammadi.	in references (sources)
(Educational Guidance and Counseling) Zahran Hamed Abdel Salam 1982	Recommended supporting books and references .(scientific journals)

Course description form

1- Course name	**Curricula and teaching methods**
2- Course code	
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**Hours 90 (2 hours per week * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name: Dr. Mohammed Mahdi

Course objectives

1- Define the concepts of teaching, learning, and education. 2- Compare the concepts of learning, education, and teaching. 3- Mention the concepts of teaching method, teaching style, and teaching strategy. 4- Compare the concepts of method, style, and strategy. 5- Clarify the pillars of the teaching process. 6- Explain the types of teaching methods, their advantages, disadvantages, and implementation methods. 7- Explain modern teaching models and strategies.		Objectives of the study subject

Teaching and learning strategies

1- Lecture method. **2- Interrogation method.** **3- Discussion method.**	The strategy

Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**Teaching and its foundations, learning, education, and teaching, is teaching an art or a science?**	**The student is able to understand the given material.**	**15 hours**	**5 week**

		elements of the educational process the foundations of good teaching			
Quarterly and daily attendance exams	**In-person lectures**	**Pillars of the teaching process, obstacles to the teaching process, characteristics of a successful teacher, teaching methods, teaching method and style, teaching**	**The student is able to understand the given material.**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**The concept of teaching style, the nature of teaching style, teaching methods and their types, the difference between the concepts of strategy, method and style, factors affecting teaching methods**	**The student is able to understand the given material.**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Criteria for selecting teaching methods, criteria for evaluating the effectiveness of a teaching method, method and curriculum, teaching method and pillars of the educational process, educational objectives.**	**The student is able to understand the given material.**	**15 hours**	**5 week**

Quarterly and daily attendance exams	**In-person lectures**	**Teaching Methods, Their Types Classification, Types, and Classroom Questions**	**The student is able to understand the given material.**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Classroom questions, lesson planning, daily plan, assessment, modern teaching models and strategies.**	**The student is able to understand the given material.**	**15 hours**	**5 week**

Course evaluation .2

Distributing a score out of 100 based on members' choices, such as attendance, daily attendance, monthly exams, reports, etc.

Learning and teaching resources .1 .61

Curriculum and Textbook, Al-Jabri Kazim Karim Redha, Dawood Abdul Salam Sabri, and Zainab Hamza Raji. Teaching Thinking, Al-Jabri Kazim Karim Redha. - General Teaching Methods, Azir, Saad Ali, Dawood Abdul - Salam Sabri, and Muhammad Hadi Hassan. Fundamentals of Teaching Methods, Muhammad, Dawood - Maher, and Majeed Mahdi Muhammad, Mosul University Press, 1991.	in references (sources)
	Recommended supporting books and references .(scientific journals)

Course description form

1- Course name	Nuclear Physics
2- Course code	
3- Semester/Year	**annual**
4- Date this description was prepared	2024/2025
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**Hours 150 (3 theoretical hours and 2 practical hours per week (5 * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name: Ahmed M. Hameed ahmediraq427@gmail.com

Course objectives

1- The student knows the nature of the nucleus and nuclear force and studies its properties 2- The student should know the behavior and nature of the nucleus. 3- The student gets to know the types of nuclear radiation 4- Study of nuclear reactions and the types and forms of these reactions. 5- The student understands the different uses of nuclear rays. - The student understands the different uses of nuclear rays6	Objectives of the study subject

Teaching and learning strategies

1. In-person lectures in classrooms. 2. Discussion method, surprise exams, and methods of refining skills. Asking intellectual questions or holding a competition between students, stimulating 3 .creative thinking and answering clearly and quickly to the problems presented	The strategy

Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	**In-person lectures**	**1- Static properties For the nucleus, such as: mass, charge, and size of the nucleus**	**Know some concepts Basic to the nucleus**	**9 Hours**	**3 ،2 ،1**

		And the kinetic properties of the nucleus 2-Definitions (isotopes, isobars, isomers, isotones) Symmetry property			
Quarterly and daily attendance exams	**In-person lectures**	**1- Binding energy 2-Average binding energy 3-Calculating separation energies 4 Line of stability and abundance Natural**	**To learn about installation nucleus**	**9 Hours**	**6 ،5 ،4**
Quarterly and daily attendance exams	**In-person lectures**	**1-Liquid drop model 2-Nuclear shell model 3-other nuclear models**	**Distinguish between models Nuclear**	**9 Hours**	**9 ،8 ،7**
Quarterly and daily attendance exams	**In-person lectures**	**1 - Types of nuclear reactions 2-Cross-sectional area and its types 3-Fission and fusion reactions**	**Recognizing the meaning of radioactivity and nuclear decay patterns**	**12Hours**	**12 ،11 ،10 13**
Quarterly and daily attendance exams	**In-person lectures**	**Nuclear reactors Fissile 1-The working principle of the reactor -2-parts of the reactor**	**Learn about energy production Nuclear reactors**	**3 Hours**	**20**
Quarterly and daily attendance exams	**In-person lectures**	**Particles accelerators Charged**	**How to speed up the particles Charged**	**3 Hours**	**21**

	Types of radiation doses **1- Risk factor** **2- Recommendations regarding limits and periods of exposure to workers In the field of radiation.**	**Identify the types of potions radiation resulting from exposure to radiation**	**6 Hours**	**23+ 22**
	Introduction to particle physics Primary	**Particle identification Primary**	**6 Hours**	**25+24**

Learning and teaching resources .1 .62	
	Main references (sources)
الفيزياء النووية أ. م. د مناف عبد حسن المثالي في الفيزياء غيداء محمد زعرين	Recommended supporting books and references (scientific journals).
	Electronic references, Internet sites

Course description

laser	Course name .56
Ph307	:Course code .57
Year	:Semester/year .58
2024/2025	The date this description was prepared .59
tures are delivered to students in person according to the schedule announced in the department	:Available attendance forms .60
90 hours	Number of study hours .61 ((total)/number of units (total
Name : Mohammed Siham	Name of the course administrator (if .62 (more than one name is mentioned

Course objectives .63

It makes students of pure science colleges of education feel the value and importance of physics and the role of lasers in science and technology and how they deal with school students after graduation and practice their specializations as teachers in primary, middle and preparatory schools and some research laboratories in government departments related to industry and in the field of research and development.	Objectives of the study subject

Teaching and learning strategies .1 .22

. Attending lectures in the study halls.1 . The method of discussion and surprise tests and methods of sharpening skills.2 3.Proposing intellectual questions and conducting competition between students and eliciting creative thought and clear and quick answers to the problems presented	**The strategy**

Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	Week
(theoretical) tests and questions	lectures	Introduction The Nonlinear Wave Equation Second harmonic generation Phase Matching Exercises and solutions	Gain knowledge in the The Nonlinear Wave Equation	**18**	**6**
(theoretical) tests and questions	lectures	laser types A solid-state laser Laser liquid state Laser gaseous state The semiconductor laser Chemical Laser	Gain knowledge in the laser types	**24**	**8**

		Exercises and solution			
(theoretical) tests and questions	lectures	Laser Applications Introduction Industrial Applications measurements and detection medical and biological applications military applications Marketing Applications Optical Communications Holography .8	Gain knowledge in the Laser Applications	**24**	**8**
(theoretical) tests and questions	lectures	Laser Safety in Research Laboratories Introduction Radiation Hazards Electrical Power Hazards Explosion Hazards Poisoning Hazards .	Gain knowledge in the Laser Safety in Research Laboratories	**24**	**8**
Exam					
Course evaluation					
Semi-daily and monthly tests And surprise exams Daily class participation					
Learning and teaching resources					
Principles of Lasers Orazio Svelto.1 **كتاب الليزرات ـ تأليف بيلا آ. لينكيل**					

Course description

Quantum Mechanic	Course name .64
Ph407	:Course code .65
Year	:Semester/year .66
2024/2025	The date this description was prepared .67
tures are delivered to students in person according to the schedule announced in the department	:Available attendance forms .68
90	Number of study hours .69 ((total)/number of units (total
Name: Dr. Younis Mohamed Atiah	Name of the course administrator (if .70 (more than one name is mentioned

Course objectives .71

➢ Students learn about the subject of Quantum Mechanic and its importance in physics. ➢ Employ the knowledge acquired by the student in explaining the natural phenomena associated with Quantum Mechanic. ➢ Provide students with the necessary thinking skills to use in the field of teaching the subject of Quantum Mechanic when practicing their specializations as teachers in primary, middle, and preparatory schools, which are part of the science or physics curriculum. ➢ Provide students with scientific research skills to use them in research and applied fields in government departments concerned with the research aspect	Objectives of the study subject

Teaching and learning strategies .1 .23

. Attending lectures in the study halls.1 . The method of discussion and surprise tests and methods of sharpening skills.2 3.Proposing intellectual questions and conducting competition between students and eliciting creative thought and clear and quick answers to the problems presented	**The strategy**

Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	Week
(theoretical) tests and questions	lectures	Introduction to mechanic quantum	Gain knowledge in the field mechanic of quantum	**3**	**1**
(theoretical) tests and questions	lectures	Dimension and Basis of a Space Vector	Gain knowledge in the field of Space Vector	**6**	**2**
(theoretical) tests and questions	lectures	Square-Integrable Functions: Wave Functions	Gain knowledge in the field of Wave Functions	**6**	**2**

(theoretical) tests and questions	lectures	،Hermitian Adjoint Projection Operators	Gain knowledge in the field of Hermitian Adjoint, Projection Operators	**3**	**1**
Exam					
(theoretical) tests and questions	lectures	Algebra Commutator	Gain knowledge in the field of Algebra Commutator	**6**	**2**
(theoretical) tests and questions	lectures	Uncertainty Relation between Two Operators	Gain knowledge in the field of Uncertainty Relation between Two Operators	**3**	**1**
(theoretical) tests and questions	lectures	Functions of Operators, Inverse and Unitary Operators	Gain knowledge in the field of Functions of Operators, Inverse and Unitary Operators	**9**	**3**
Exam					
Quarterly and daily attendance exams	lectures	Matrix Representation of Kets, Bras, and Operators	Gain knowledge in the field of Matrix Representation of Kets, Bras, and Operators	9	**3**
Quarterly and daily attendance exams	lectures	Matrix Representation of the Eigenvalue Problem	Gain knowledge in the field of Matrix Representation of the Eigenvalue Problem	**9**	**3**
Exam					
Quarterly and daily attendance exams	lectures	Position and Momentum Representation	Gain knowledge in the field of Position and Momentum Representation	**9**	**3**
Quarterly and daily attendance exams	lectures	Mechanics Matrix	Gain knowledge in the field of Mechanics Matrix	**9**	**3**
Quarterly and daily attendance exams	lectures	Wave Mechanics	Gain knowledge in the field of Wave Mechanics	**9**	**3**
Quarterly and daily attendance exams	lectures	Hydrogen atom	Gain knowledge in the field of Hydrogen atom	**9**	**3**
Exam					
Course evaluation					
Semi-daily and monthly tests And surprise exams Daily class participation					
Learning and teaching resources .63					
64. P. A. M. Dirac, “Principles of quantum mechanics”, Oxford University Press (1947)- 65. د. ج. غريفيثس، مقدمة في ميكانيكا الكم، ط3، كامبريدج برس - (2018)					

Course description

Solid state	Course name .72
Ph307	:Course code .73
Year	:Semester/year .74
2024/2025	The date this description was prepared .75
tures are delivered to students in person according to the schedule announced in the department	:Available attendance forms .76
	Number of study hours .77 ((total)/number of units (total
	Name of the course administrator (if .78 (more than one name is mentioned

Course objectives .79

1. The student should know the science of solids, their types, what is the Bravise lattice and its types 2. The student should know the science of X-rays and what are the particles that are accompanied by waves that can be used to study crystals 3. The student should know Bragg's law and what are the conditions for applying Bragg's law 4. The student should know the inverted lattice and how to apply it 5. The student should know the lattice vibrations and their types 6. The student should know the theories of thermal conductivity and specific heat	Objectives of the study subject

Teaching and learning strategies .1 .24

. Attending lectures in the study halls.1 . The method of discussion and surprise tests and methods of sharpening skills.2 3.Proposing intellectual questions and conducting competition between students and eliciting creative thought and clear and quick answers to the problems presented	**The strategy**

Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	Week
(theoretical) tests and questions	lectures	Introduction Crystalline structure non-crystalline structure Unit cell Bravise lattice & non -Bravis lattice. kind of lattice structure: a- simple cubic,	Gain knowledge in the Crystalline structure	**3**	**1**

		b-Body center cubic c- Face centre cubic			
(theoretical) tests and questions	lectures	Hexagonal system symmetry Miller Indices Incident Rays & Braggs Law X-Ray - Neutrons- Electron	Gain knowledge in the hexagonal system symmetry	**6**	**2**
(theoretical) tests and questions	lectures	Diffraction Method: a- Laue Method. b- Powder Method C- Rotating method Reciprocal Lattice Lattice Structure Factor	Gain knowledge in the Diffraction Method: a- Laue Method. b- b- Powder Method C- Rotating method	**6**	**2**
(theoretical) tests and questions	lectures	lattice Vibration Vibrational modes of linear monoatomic lattice Diatomic linear lattice Thermal Conductivity theories Specific heat theories	Gain knowledge in the lattice Vibration Vibrational modes of linear	**3**	**1**
Exam					
Course evaluation					
Semi-daily and monthly tests And surprise exams Daily class participation					
Learning and teaching resources					
1. فيزياء الحالة الصلبة د. مؤيد جبرائيل 2. فيزياء الجوامد د. محمد أحمد الجاللي 3. Introduction to Solid State Physics Charles Kittel 4. Fundamentals of Solid State Engineering Manijeh Razeghi 5. Materials Science and Engineering an Introduction William D. Calliste					

Course description form

1- Course name	Electromagnetic wave
2- Course code	PH402
3- Semester/Year	yearly
4- Date this description was prepared	**2024/2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
- Number of study hours (total)/number of units 6 (total)	**hours 90**
7- Name of the course administrator (if more than one name is mentioned	**Name: Dr. Mohammed Salim Jasim** **Msjadr72@gmail.com**

Course objectives .80

1. Introducing students to the subject of electromagnetic physics and giving students a basic overview of the electrostatic field in conductive and insulating media and explaining the importance of the electric and magnetic field and how to benefit from them and avoid the dangers resulting from them and their role in understanding the principles of modern physics and its daily uses and how to employ this knowledge in facing daily life developments in the field of education, family, society **2. Makes students of colleges of education for pure sciences feel the value and importance of physics and the role of electromagnetic radiation in science and technology, especially in the field of towers, communications and mobile phones and how to deal with school students after graduation and practice their specialties as teachers in middle and preparatory schools and some research laboratories in government departments related to industry and in the field of research**	Objectives of the study subject

Teaching and learning strategies .25

1. In-person lectures in classrooms. **2. Discussion method, surprise exams, and methods of refining skills.** **Asking intellectual questions or holding a competition between students, stimulating creative 3 .thinking and answering clearly and quickly to the problems presented**	**The strategy**

Course structure .1 .66

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Quarterly and daily attendance exams	In-person lectures	The student should know vector analysis and types of coordinates Vector analysis	The student is able to understand the Vector analysis	**12**	**4**
Quarterly and daily attendance exams	In-person lectures	Steady electricity (electrostatics)	The student is able to	**15**	**5**

			understand the static electricity		
Quarterly and daily attendance exams	In-person lectures	Solving electrostatic problems.	The student is able to Solving electrostatic problems	**12**	**4**
Exam1					
Quarterly and daily attendance exams	In-person lectures	Electrostatic field in insulating media	The student is able to understand the Electrostatic field	**51**	**5**
Quarterly and daily attendance exams	In-person lectures	Electrostatic energy	The student is able to understand the Electrostatic energy	**12**	**4**
Exam2					
Quarterly and daily attendance exams	In-person lectures	Electric current and magnetism	The student is able to understand the Electric current and magnetism	**15**	**5**
Quarterly and daily attendance exams	In-person lectures	Electromagnetic wave equation and its solution in different media	The student is able to understand the Electromagnetic wave equation	**6**	**2**
Quarterly and daily attendance exams	In-person lectures	Antennas and their types	The student is able to understand the Antennas and their types	**6**	**2**
Course evaluation					
Daily class participation And surprise exams, ،* Semi-daily and monthly tests					
Learning and teaching resources					
المجالات الكهرومغناطيسية الجزء الأول والثاني اساسيات النظرية الكهرومغناطيسية الجزء الأول والثاني اساسيات الكهربائية والمغناطيسية سلسلة ملخصات شوم: الكهرومغناطيسيات 2000(تأليف جوزيف ادمنس)				Main references (sources)	

Course description form

1- Course name	**Measurement and Educational Evaluation**
2- Course code	
3- Semester/Year	**annual**
4- Date this description was prepared	**2024 /2025**
5- Available attendance forms	Lectures are delivered to students in person according to the schedule announced in the department
6- Number of study hours (total)/number of units (total)	**Hours 90 (2 hours per week * 30 weeks)**
7- Name of the course administrator (if more than one name is mentioned	Name : Rana Sabeh

Course objectives

1. Introduce the student to the importance of calendar measureme and its role in improving the educational process. **.2- Introducing the student to the basic concepts in measurement, educational and psychological evaluation** **2** **3. Types of achievement tests, advantages and disadvantages of each of the methods, including** **4. Introducing the student to the non-test methods and the advantages and disadvantages of each of them**		Objectives of the study subject

Teaching and learning strategies

1. Attendance lectures in classrooms. 2. The style of discussion, surprise exams and methods of honing skills. 3. Ask intellectual questions or hold a competition between students, arouse creative thought and a clear and quick answer to the problems received .	The strategy

Course structure

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week

Quarterly and daily attendance exams	**In-person lectures**	**Introduction to the historical development of measurement and Educational Evaluation**	**The student is able to understand the given material.**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Historical development of measurement and calendar concepts**	**The student is able to understand the given material.**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Oral And instrumental tests**	**The student is able to understand the given material.**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Essay and objective tests**	**The student is able to understand the given material.**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Honesty and its types**	**The student is able to understand the given material.**	**15 hours**	**5 week**
Quarterly and daily attendance exams	**In-person lectures**	**Constancy and calculation methods**	**The student is able to understand the given material.**	**15 hours**	**5 week**

Course evaluation .2

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports ....etc
Semi-daily and monthly tests, unannounced examinations .
*Divide the division into several groups and give each group a variety of exercises and make the process of evaluating the answers mutual between the students.
*Diligent follow-up to solve class questions and pay attention to the process of writing simple reports on any valuable information or statistical term

Learning and teaching resources .1 .67

Measurement and evaluation of the university studen Abdul Hussein rizouki and Yassin Hamid Eyal * Measurement and evaluation in the educational process, Ahmed Suleiman Odeh	in references (sources)
Psychometrics and Educational Evaluation, Sabah Al-ajili, Anwar Hussein	Recommended supporting books and references (scientific journals).