



Ministry of Higher Education and Scientific Research
Scientific Supervision and Evaluation
Department Assurance, Quality, and accreditation Academic
Department of Physics / Faculty of Science - Mustansiriyah
University
2024-2025

Academic Program and Course Description Guide

2025

Introduction:

The educational program is a coordinated and organized package of courses that include procedures and experiences organized in the form of academic vocabulary whose main purpose is to build and refine the skills of graduates, making them qualified to meet the requirements of the labor market, which is reviewed and evaluated annually through internal or external audit procedures and programs such as the external examiner program.

The description of the academic program provides a brief summary of the main features of the program and its courses, indicating the skills that are being worked on to acquire for students based on the objectives of the academic program, and the importance of this description is evident because it represents the cornerstone in obtaining program accreditation and is written jointly by the teaching staff under the supervision of the scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the vocabulary and paragraphs of the previous guide in light of the developments and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (Bologna, quarterly) system, as well as the adoption of the description of the academic program circulated according to the book of the Department of Studies T 3/2906 on 3/5/2023 .

In this regard, we can only emphasize the importance of writing a description of academic programs and courses to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The description of the academic program provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, proving whether he has made the most of the available learning opportunities. It is derived from the description of the program.

Program Vision: An ambitious picture for the future of the academic program to be a sophisticated, inspiring, stimulating, realistic and applicable program.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (semester, yearly, Bologna track) whether it is a requirement (ministry, university, college and scientific department) with the number of study units.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by the student after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty member to develop the student's teaching and learning, and they are plans that are followed to reach the learning goals. That is, describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description For
University Name: Al-Mustansiriyah
Faculty/Science
Scientific Department: Physics

Academic or Vocational Program Name: Bachelor of Science in
Physics

Final Certificate Name:.. Bachelor of Science in Physics

Academic system: Third and fourth stages courses

Date Description Setup: 5-3-2024

File filling date: 6-6-2024

Signature

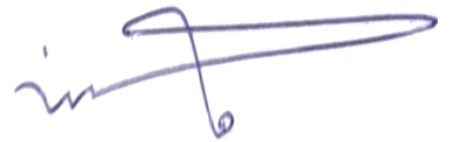


Scientific Associate Name: Prof.

Dr. Ahmed Mahdi Rahima

Date: : 1 / 7 /2025

Signature



Head of department: Prof.

Firas Sabih Mohammed

Date: 1 / 7 /2025

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Division of Quality Assurance and University Performance

Name of the Director of the Quality Assurance and University

Performance Division:

Signature



Approval of the Dean Prof. Mithaq Talib Kati

Date : 1 / 7 /2025



1. Program Vision

The Department of Physics at the College of Science is keen to consolidate the scientific excellence of the students of the department and to emphasize information and knowledge

The department also seeks to develop the skills and individual experiences of students to achieve a better career future and in line with the requirements of the labor market

2. Program Mission

Through its mission, the Department of Physics sought to prepare and prepare students who are scientifically and practically capable in the fields of physics

Various and focus on the aspect of teaching skills and meet quality standards in preparing and qualifying distinguished graduates at the local and regional levels.

3. Program Objectives

Preparing scientifically qualified, skilled and experienced graduates to serve state institutions and society, public and private, and instilling the spirit of knowledge and disseminating it through scientific research and other activities such as seminars and conferences, in addition to preparing specialized scientific cadres who hold higher degrees, masters and doctorates in various disciplines of physics.

4. Program Accreditation

There isn't any

5. Other external influences

Field visits, practical part, scientific consultations, questionnaires for students, professors and employers

Program Structure						6.
Reviews*	Percentage of units of study	Number of Units	Practical Study Hours	Theoretical study hours	Number of Courses	Program Structure
Basic Course	14.81%	20	-	12	7	University Requirements
Basic Course	26.00%	35	10	25	15	College Requirements
Basic Course	59.25 %	80	42	70	35	Department Requirements
		There isn't any	There isn't any	There isn't any	There isn't any	Summer Training
		135	52	112	57	Total

* It can include notes whether the course is basic or optional.

7. Program Description				
Credit Hours		Course Name	Course or Course Code	Year/Level
Practical	Theoretical			
2	2	Mechanics and properties of a substance	508211113	The first
2	2	Electrical Section	508211113	
2	2	Magnetism	508211123	
-	2	mathematics	5000163	
2	2	Calculators	5086452	
-	2	General astronomy	5000120	
-	2	Human Rights	508211132	
2	-	democracy	5000120	
		Arabic language	508211222	
2	2	Modern Physics (1)	50821214	The second
2	2	Thermodynamic heat	5081220	
-	2	Analytical Mechanics (1)	5081310	
2	2	Analogue electronics	5081320	
-	2	Mathematics (3)	5082108	
-	2	English Language (2)	5086452	
2	-	Calculators (3)	5000164	
2	2	Modern Physics (2)	50821214	
2	2	Thermodynamics & Statistics (2)	50821224	
-	2	Analytical Mechanics (2)	5081310	
2	2	Digital Electronics	50812142	
-	2	Mathematics (4)	5082108	
-	2	Sound and wave motion	5086452	
2	-	Calculators (4)	5000164	
2	2	Engineering Optics	508213034	
2	2	Laser Physics (1)	5081325	
-	2	Quantitative Mechanics (1)	5081460	
2	2	Materials Physics (1)	5081355	

2	2	Numerical analysis	5082265	Third
-	2	English Language (3)	508213054	
-	2	Optional (1)	5086452	
2	2	Physical Optics	508213034	
2	2	Laser Physics (2)	5081325	
-	2	Quantitative Mechanics (2)	5081460	
2	2	Physics of Materials (2)	5081355	
2	2	Mathematics (5)	5082108	
-	2	Molecular physics	5081317	
-	2	Spectra	5083214	
-	2	Optional (2)	5086452	
2	2	Nuclear Physics (1)	5081470	Fourth
2	2	Solid State Physics (1)	5081465	
-	2	Electromagnetic Theory (1)	5081330	
-	2	Mathematical Physics (1)	50821214	
-	2	Nanoscience	508213064	
-	2	English (4)	508213054	
-	2	Optional (3)	5086452	
-	2	Research Project	508213074	
2	2	Nuclear Physics (2)	5081470	
2	2	Solid State Physics (2)	5081465	
-	2	Electromagnetic Theory (2)	5081330	
-	2	Mathematical Physics (2)	50821214	
-	2	Plasma Physics	5081485	
-	2	Biophysics	508213054	
-	2	Optional (4)	5086452	
-	2	Research Project	508213074	

8. Expected learning outcomes of the program	
Knowledge	
1 - The student should know the basics of physics. 2 - The program aims to raise the student's potential to the level of understanding in the field of physics as far as it is related to his specialization. 3 - Developing and raising the student's cognitive abilities .	
Skills	
- Teaching the student how to become a leader on logical thinking. 2 - Teach the student analysis and employ the vocabulary of the prescribed curriculum. 3 - Developing the mental and self-ability of the student in the specialization is an important part of his field of specialization. 4 - Providing the student with the ability to communicate and use modern educational techniques effectively. 5 - The ability to work collectively as part of a team in different fields .	
Values	
Developing students' abilities to understand the material	

9. Teaching and Learning Strategies
1 - Theoretical lectures. 2 - Surprise exams after each lecture. 3 - Conduct scientific discussions. 4 - Urging the completion of various reports during the semester.

5 - Try to deal with the scientific material in a way that makes the student highly focused through questions and exchange Cognitive among students.

10. Evaluation methods

- 1 - Daily, monthly tests.
- 2 - Scientific research.
- 3 - Conducting seminars for students to find out the extent of their comprehension of the material.
- 4 - Weekly, monthly, daily exams and the end-of-year exam.
- 5 - Discussion of graduation projects for students

Faculty			Specialization		Name	Academic Rank
Administrative status	angel		special	year		
Head of Department	angel	Phd	Laser & Optoelectronics	physics	Firas Sobeih Muhammad	professor
Preliminary Course	angel	Phd	Nuclear physics	physics	Walid Jabbar Muhanna	Assistant Professor
Higher Decision	angel	Phd	Atomic physics	physics	Nadia Jassim Ghadeeb	Assistant Professor
	angel	Phd	Image processing	physics	Ali Abd Dawood Al , Zabaki	professor
	angel	Phd	Nanomaterials	physics	Raad Saadoun Sabri	professor
	angel	Phd	Theoretical physics	physics	Ahmed Aziz Ahmed	professor
	angel	Phd	Materials Science	physics	Mahasen Fadel Hadi	professor
	angel	Phd	Materials Science	physics	Bahjat Bahlul Kazim	professor
	angel	Phd	Solid State Physics	physics	Wissam Jaafar Aziz	professor
	angel	Phd	laser	physics	Mazen Ali Abd Ali	professor
	angel	Phd	Thin Film	physics	Nazir Jassim Mohammed	professor
	angel	Phd	Thin Film	physics	Ahmed Naji Abdul qadir	professor
	angel	Phd	Photovoltaic	physics	Muayad Jabbar Zuri	professor

	angel	Phd	Materials Science	physi cs	Randa Kamel Hussein	professor
	angel	Phd	Radiation physics	physi cs	Nada Farhan Kazem	professor
	angel	Phd	Digital Image Processing	physi cs	Hazem Kata Dawai	professor
	angel	Phd	Digital Image Processing	physi cs	Mohamed Youssef Kamel	professor
	angel	Phd	Thin Film	physi cs	Muhammad Odeh Dawood	professor
	angel	Phd	Plasma Physics	physi cs	Beida Mohsen Ahmed	professor
	angel	Phd	Nanomaterials	physi cs	Aseel Mustafa Abdul majeed	professor
	angel	Phd	polymer	physi cs	Asrar Abdel Moneim Saeed	professor
	angel	Phd	Nanomaterials	physi cs	Osama Abdul aziz Dakhil	professor
	angel	Phd	Materials Science	physi cs	Wafaa Mahdi Saleh	professor
	angel	Phd	Thin Film	physi cs	Muslim Ezzedine Abd	professor
	angel	Phd	Thin Film	physi cs	Ihsan Salah Hassan Ali	Assistant Professor
	angel	Phd	Photovoltaic	physi cs	Suad Hadi Hamza	Assistant Professor
	angel	Phd	Digital Image Processing	physi cs	Faten Ezzat Mohieldin	Assistant Professor
	angel	Phd	Optoelectronics	physi cs	Elham Jassim Mohammed	Assistant Professor
	angel	Phd	Molecular Physics	physi cs	Walid Salah Abd El , Wahab	Assistant Professor
	angel	Phd	Theoretical physics	physi cs	Mezher Baqir Saleh	Assistant Professor
	angel	Phd	Theoretical physics	physi cs	Abd El , Halim Khudair	Assistant Professor
	angel	Phd	Nuclear physics	physi cs	Etab Fadel Hussein	Assistant Professor
	angel	Phd	Nuclear/Radiation Physics	physi cs	Muhammad Hatem Hashem	Assistant Professor

	angel	Phd	Nanomaterials	physi cs	Ahmed Shukr Al , Haddad	Assistant Professor
	angel	Phd	Nanoelectronics	physi cs	Emad Hamid Hussein	Assistant Professor
	angel	Phd	Photovoltaic	physi cs	Haidar Jawad Muhammad	Assistant Professor
	angel	Phd	mathematics	mathe matic s	Hassan Abdul rahman Salman	Assistant Professor
	angel	Phd	Molecular Physics	physi cs	Esraa Fakher Khalaf	Assistant Professor
	angel	Phd	Optoelectronics	physi cs	Uday Mazen Abd El , Moneim	Assistant Professor
	angel	Phd	Photonics	physi cs	Abbas Kamal Hassan Albarzanji	Assistant Professor
	angel	Phd	Solid/Medical Applications	physi cs	Huda Muhammad Jawad	Assistant Professor
	angel	Phd	Digital Image Processing	physi cs	Ahlam Muhammad Kazem	Assistant Professor
	angel	Phd	Plasma Physics	physi cs	Rafid Abbas Ali	Assistant Professor
	angel	Phd	Nanomaterials	physi cs	Asaad Mejbel Abbas	Assistant Professor
	angel	Phd	Molecular Physics	physi cs	Hanan Odeh Nayef	Assistant Professor
	angel	Phd	Plasma	physi cs	Raghad Saadoun Mohammed	Assistant Professor
	angel	Phd	Optics	physi cs	Mohammed Jassim Mohammed	Assistant Professor
	angel	Phd	Molecular Physics	physi cs	Asma Sattar Giad Muhaisen	Assistant Professor
	angel	Phd	Thin Film	physi cs	Sahar Issa Saeed	Assistant Professor
	angel	Phd	Theoretical physics	physi cs	Enaam Hatem Khudair	teacher
	angel	Phd	laser	physi cs	Baida Khalifa Hamad	teacher
	angel	Phd	Molecular Spectroscopy	physi cs	Ruba Taha Salem	teacher
	angel	Phd	Optics / Laser	physi cs	Murtaza Fayeze Sultan	teacher

	angel	Phd	Medical radiation	physi cs	Hanaa Saleh	Assistant Professor
	angel	Phd	Theoretical physics	physi cs	Faten Sajit Matar	Assistant Professor
	angel	Phd	Optics	physi cs	Zainab Rahim Hussain	Assistant Professor
	angel	Phd	Laser	physi cs	Faten Hamid Mohammed	Assistant Professor
	angel	Phd	Material and plasma applications	physi cs	Shaimaa Hussein Abd Musallam	teacher
	angel	Phd	Solid Electronics	physi cs	Jassim Shamkhi	teacher
	angel	Phd	Arabic Language	Arabi c Lang uage	Mays Adnan Abdul rasool	teacher
	angel	Phd	Fiber Optic	physi cs	Miami Abdul latif Muhammad	teacher
	angel	Phd	Nuclear physics	physi cs	Doaa Abd Salim	teacher
	angel	Phd	laser	physi cs	Bahaa Jawad Alwan	Assistant Professor
	angel	Phd	Atomic physics	physi cs	Saif Mohammed Abdullah Hussein	teacher
	angel	Phd	astronomy	physi cs	Nizar Abdul mahdi Jaber Alwasiti	Assistant Professor
	angel	Master	Thin Film	physi cs	Huda Jaber Ali	teacher
	angel	Master	Physics of Materials	physi cs	Farah Jawad Kazim	Assistant Professor
	angel	Master	Optics	physi cs	Maysam Tariq Sadek	teacher
	angel	Master	Image processing	physi cs	Ali Jassim Mohammed Ali	Assistant Professor
	angel	Master	Quantum optics	physi cs	Saad Khalid Rahi	Assistant Professor
	angel	Master	Nuclear physics	physi cs	Rana Uday Abd El , Jalil	Assistant Professor
	angel	Master	laser	physi cs	Haidar Abdullah Kazim	Assistant Professor
	angel	Master	Laser Physics	physi cs	Asma Diaa Nassif	Assistant Professor

	angel	Phd	Electromagnetic	physi cs	Lama Yassin Abbas	Assistant Professor
	angel	Master	Materials Science	physi cs	Safaa Farhoud Madloul	Assistant Professor
	angel	Master	Solid State Physics	physi cs	Lamia Ali Latif	Assistant Professor
	angel	Master	Math	Math	Raghad Abdullah Al , Qadir	Assistant Professor
	angel	Master	Laser Physics	physi cs	Hala Fakher Dagher	teacher
	angel	Master	Spectroscopy and laser	physi cs	Haitham Mouloud Mikhliif	teacher
	angel	Master	Atomic theory	physi cs	Sahar Abdul aziz Muhammad	Assistant Professor
	angel	Master	Nuclear physics	physi cs	Huda Talal Suleiman	teacher
	angel	Master	nuclear	physi cs	Donia Fadel Talab	teacher
	angel	Master	Solid State / Thin Film	physi cs	Ali Muhammad Jabbar	teacher
	angel	Master	Atomic physics	physi cs	Rawaa Yassin Taha	teacher
	angel	Master	Solid State / Thin Film	physi cs	Nidal Ali Hussein	teacher
	angel	Master	Atomic physics	physi cs	Zainab Shaker Nasser	teacher
	angel	Master	Physics of Materials	physi cs	Reem Sami Ali	teacher
	angel	Master	Steel / Polymer	physi cs	Sorour Nouri Ismail	teacher
	angel	Master	Medical Physics	physi cs	Zainab Hamza Baqi	teacher
	angel	Master	Remote sensing	physi cs	Emad Hamid Ahmed	teacher
	angel	Master	Approximation theory	physi cs	Meeting Abdul Karim Hussein	teacher
	angel	Master	laser	physi cs	Adnan Khalid Hassan	Assistant Lecturer
	angel	Master	Digital Image Processing	physi cs	Firas Sabah Abdul amir	Assistant Lecturer

	angel	Master	Physics of Materials	physics	Lamia Mohammed Raouf	teacher
	angel	Master	Theoretical physics	physics	Bushra Khammas Abbas	teacher
	angel	Master	Atomic physics	physics	Ishraq Ahmed Shaker	teacher
	angel	Master	Self-defense	physics	Zahra Sabah Rashid	teacher
	angel	Master	Solid State Physics	physics	Ronak Abdul salam Abdul karim	Assistant Lecturer
	angel	Master	Laser & Optics	physics	Farouk Khaled Shaker	teacher
	angel	Master	Biological physics	physics	Nizar Khalaf Mohan	teacher
	angel	Master	English novel	physics	Nawal Hamdan Mahmoud	teacher
	angel	Master	Optics	physics	Shaima Hassan Kafi	teacher
	angel	Master	Laser - Electro-Optics	physics	Montazer Jawad Khudair	teacher
	angel	Master	Remote Analysis / Sensing	physics	Mohammed Mitab Jassim	teacher
	angel	Master	Technological knowledge	physics	Asma Mohamed Nasser	teacher
	angel	Master	Laser & Optics	physics	Mohammad Jawad Kazem	teacher
	angel	Master	Electrooptics	physics	Asma Abdul sattar Abdul razzaq	teacher
	angel	Master	Medical Physics	physics	Wahb Bassem Mahdi	teacher
	angel	Master	Materials Science	physics	Zainab Kazem Hamza	Assistant Lecturer
	angel	Master	Optics	physics	Nour Wissam Sabri	Assistant Lecturer
	angel	Master	Materials Science	physics	Salwa Karim Dawood	Assistant Lecturer
	angel	Master	Materials Science	physics	Kazal Muhammad Qadir	Assistant Lecturer
	angel	Master	Materials Science	physics	Sally Yacoub Taher	Assistant Lecturer

	angel	Master	Applied Physics	physi cs	Nour Uday Abd El , Khaliq	Assistant Lecturer
	angel	Master	Materials Science	physi cs	Nisreen Khaled Fahad	Assistant Lecturer
	angel	Master	Materials Science	physi cs	Rania Raad Kazem	Assistant Lecturer
	angel	Master	Thin Film	physi cs	Farah Abdul razzaq Jassim	Assistant Lecturer
	angel	Master	Medical Physics	physi cs	Mustafa Younis Ali	Assistant Lecturer
	angel	Master	physics	physi cs	Sahar Muhammad Ali	Assistant Lecturer
	angel	Master	Materials Science	physi cs	Lara Adnan Kazim	Assistant Lecturer
	angel	Master	Materials Science	physi cs	Hatem Naseef's gift	Assistant Lecturer
	angel	Master	Materials Science	physi cs	Batool Zaki Fahim	Assistant Lecturer
	angel	Master	Materials Science	physi cs	Hala Adnan Ahmed	Assistant Lecturer
	angel	Phd	Materials Science	physi cs	Haneen Ali Jassim	Assistant Lecturer
	angel	Master	Solid State Physics	physi cs	Duha Abdul karim Kazem	Assistant Lecturer
	angel	Master	Media / PR	physi cs	Zahraa Hossam Eddin Ibrahim	Assistant Lecturer
	angel	Master	Nanomaterials	physi cs	Ihab Adnan Thabet	Assistant Lecturer
	angel	Master	Nuclear physics	physi cs	Hadeel Ghali Ashnayin	Assistant Lecturer
	angel	Master	Laser & Optoelectronics	physi cs	Marwa Abdul rahman Dawood	Assistant Lecturer
	angel	Master	Laser and Molecular	physi cs	Surat Yasin Khalaf	Assistant Lecturer

Professional Development
Mentoring new faculty members
Follow the program accurately. Ask many assignments that require external information.
Professional development of faculty members
Increasing practical discussions and continuing to follow the latest scientific research or good knowledge of the importance of how to conduct practical experiments.

11. Acceptance Criterion
Admission is central (ministerial) and depends on the rate of students and the rate of admission to the college in that year, where our department occupies the second place in admission for the college, as the newly admitted students are subject to an oral interview to indicate the extent of their desire to join our department in order to organize statistics for the department.

12. The most important sources of information about the program
1- Methodological books approved by the Scientific Committee Committee in the department and the committees of the faculties of science. 2 - Auxiliary books. 3. Books and enrichment sources / sources in English. 4. Additional sources from the Internet.

Program Skills Outline															
Learning outcomes required from the program															
Values				Skills				Knowledge				Basic or optional	Course Name	Course Code	Level
C4	C3	C2	C1	B4	B3	B2	B1	A4	A3	A2	A1				
	√	√	√		√	√			√		√	Department Requirements	Mechanics and properties of a substance	50821111	First stage 2024-2025
	√	√	√		√	√			√		√	Department Requirements	Electrical & Magnetic	50821122	
	√	√	√		√	√			√		√	Department Requirements	mathematics	50821113	
	√	√	√		√	√			√		√	Department Requirements	Calculators	5086452	
	√	√	√		√	√			√		√	Department Requirements	General astronomy	5000120	
	√	√	√		√	√			√		√	College Requirements	Human Rights	5082111	
	√	√	√		√	√			√		√	University Requirements	Arabic language	5082112	
	√	√	√		√	√			√		√	Department Requirements	Modern physics	5081310	Second stage 2024-2025
	√	√	√		√	√			√		√	Department Requirements	Thermodynamic heat	5081355	
	√	√	√		√	√			√		√	Department Requirements	Analytical Mechanics	5082265	
	√	√	√		√	√			√		√	Department	Analogue electronics	5081220	

												Requirements			
	√	√	√		√	√			√	√	Department Requirements	Math	5000164		
	√	√	√		√	√			√	√	College Requirements	English language	5081225		
	√	√	√		√	√			√	√	College Requirements	Computers	5000164		
	√	√	√		√	√			√	√	Department Requirements	Sound and wave motion	5086452		
	√	√	√		√	√			√	√	Department Requirements	Optics	50821303		
	√	√	√		√	√			√	√	Department Requirements	Laser Physics	5081325		
	√	√	√		√	√			√	√	Department Requirements	Quantitative Mechanics	5081460		
	√	√	√		√	√			√	√	Department Requirements	Physics of Materials	5081355		
	√	√	√		√	√			√	√	Department Requirements	Numerical analysis	5082265		Third stage 2024-2025
	√	√	√		√	√			√	√	College Requirements	English	5082130		
	√	√	√		√	√			√	√	Department Requirements	Molecular physics	5081317		
	√	√	√		√	√			√	√	Department Requirements	Spectra	5083214		

	√	√	√		√	√			√	√	Department Requirements	Nuclear physics	5081470	Fourth stage 2024-2025	
	√	√	√		√	√			√	√	Department Requirements	Solid State Physics	5081465		
	√	√	√		√	√			√	√	Department Requirements	Electromagnetic theory	5081330		
	√	√	√		√	√			√	√	Department Requirements	Mathematical Physics	50821214		
	√	√	√		√	√			√	√	Department Requirements	Nanoscience	50821306		
	√	√	√		√	√			√	√	Department Requirements	Plasma Physics	50821306		
	√	√	√		√	√			√	√	Department Requirements	Biophysics	50821305		
	√	√	√		√	√			√	√	Department Requirements	Research Project	but		

13. Program Development Plan

First stage

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Mechanics</u>	Module Delivery	
Module Type	<u>C</u>	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	PHY-111		
ECTS Credits	<u>8</u>		
SWL (hr/sem)	<u>175</u>		
Module Level	1		
Administering Department	02	College	01
Module Leader	Dr.Inam Hatim	e-mail	Inamhatim73@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Classical mechanics is concerned with examining how bodies move when subjected to different forces, as well as the forces acting on non-moving bodies. The laws of classical mechanics enable us to calculate the trajectories of baseballs, bullets, spacecraft, and planets as they orbit the sun. Even for someone who has no professional reason to care about any of these things, there is a strong rational rationale for studying classical mechanics; It is indisputably the best example of a theory that explains a huge number of phenomena on the basis of the fewest number of simple principles. Anyone who seriously

	studies mechanics, even at an introductory level, will find this study a real intellectual adventure. This course covers the basic topics and core concepts of mechanics. Each chapter includes a number of examples; They are issues related to the material presented in the chapter, in addition to solutions to those issues and some related discussions.
Module Learning Outcomes	Interest in studying the forces applied to the body, its movement, and particle systems in a three-dimensional space, and trying to formulate those relationships in physical laws that allow deducing the course of future movement on the basis of knowledge of the initial conditions.
Indicative Contents	This course include most important information about the scalars & vectors, analyzing motion, the way of its, product & measurements their effect, analysis of these method and comparison between these method. The course also describes the simple harmonic motion and its applications to some mechanical systems, such as the motion of simple pendulum and the frictionless motion of mass attached to an end of a spring.

Learning and Teaching Strategies	
Strategies	Classical mechanics describes the motion of very small (microscopic) bodies, from the first projectiles to machines and astronomical bodies such as planets, galaxies, spaceships, and stars. In addition, it has specialties that deal with solids, liquids, and gases, and many subtopics. Classical mechanics gives accurate results as long as the field of study in it will be on large objects whose speed is not close to the speed of light. Therefore, when the objects we deal with are very small, we must use a second branch of mechanics, which is quantum mechanics, which can link between the laws of microscopic physics and the nature of atomic matter, and it can treat the duality (wave and material) of atoms and particles.

Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	82	Unstructured SWL (h/w)	2
Total SWL (h/sem)	175		

Module Evaluation					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #6, #7
	Assignments	2	10% (10)	6 and 13	LO #3, #4 and #6, #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #12
	Midterm Exam	2hr	10% (10)	7	LO #1 - #7

Summative assessment	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
Week	Material Covered
Week 1	Scalars and vectors , Addition of vectors , subtraction of vectors
Week 2	Vectors Multiplication ,resolution of vectors
Week 3	Free falling bodies , projectiles
Week 4	Motion , linear Motion
Week 5	Newton Laws Rotational Kinetic Energy,
Week 6	Friction , sliding or Kinetic friction , static friction
Week 7	Frictional, forces in fluids , Angular Measure, Angular Velocity,
Week 8	Exam
Week 9	Harmonic Motion Simple pendulum S.H.M. Damped Harmonic Motion
Week 10	Combined Translation and Rotation, Angular Acceleration Torque and Angular Acceleration.
Week 11	Power, Angular Momentum
Week 12	Moment of Inertia
Week 13	Exam

Week 14	Circular Motion
Week 15	Centripetal Force
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
Week	Material Covered
Week 1	Lab 1: The resultant force experiment (balance of forces).
Week 2	Lab 2: the pulleys experiment.
Week 3	Lab 3: the one - sided and two - sided levers experiment.
Week 4	Lab 4: the simple pendulum experiment.
Week 5	Lab 5: The experiment of measuring the static and sliding friction coefficient between two surfaces.
Week 6	Lab 6: the free - falling objects.
Week 7	Lab 7: Determination ground acceleration by approximating a ball rolling on a concave surface
Week 8	Lab 8: Determination radius of gyration for a cylinder rolling an inclined surface.
Week 9	Lab 9: Determination of moment of inertia of a metal using bifilar suspension.
Week 10	Lab 10: Determine the moment of inertia for different shapes

Week 11	Lab 11: Find the ground acceleration by means of the compound pendulum.
Week 12	Lab 12: The moment of inertia of the flywheel .

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	1 . Serway and Jwett "Physics for Scientists and Engineers with Modern Physics"; 9th edition Thomson Learning Academic Resource center (2014). 2 . Sears and Zemanskys "University Physics, thirteenth Edition, person, Addison Wesley (2012). 3 .N. Subrohmnyam, Brijlal "Wave and Oscillations" second revised Edition, VIKAS Publishing House PVT LTD (2004). 4 . Fundamentals of Physics), written by Professor of Physics F. Bush at the University of Dayton, translated by Dr. Saeed Al-Jaziri and Dr. Muhammad Amin Suleiman (Cairo University) 1982.	No but it is available as PDF
Recommended Texts	1. Mechanics of Materials , Mark Thompson ,2011 2. Mechanics of Materials 6th edition , cardona ,2010 3. Mechanics of Material and interfaces , Chandra kants. Desai,2007 4. Engineer's hand book , M.y.Densia,2005	No but it is available as PDF
Websites		

Group	Grade	Marks %	Definition
Success Group (50 - 100)	A - Excellent	90 - 100	Outstanding Performance
	B - Very Good	80 - 89	Above average with some errors
	C - Good	70 - 79	Sound work with notable errors
	D - Satisfactory	60 - 69	Fair but with major shortcomings
	E - Sufficient	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	(45-49)	More work required but credit awarded
	F – Fail	(0-44)	Considerable amount of work required

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Electricity</u>	Module Delivery	
Module Type	<u>core</u>	χ Theory χ Lecture $\checkmark$ Lab $\checkmark$ Tutorial χ Practical χ Seminar	
Module Code	PHY-112		
ECTS Credits	<u>7.00</u>		
SWL (hr/sem)	175		
Module Level	1	Semester of Delivery	1
Administering Department	02	College	01
Module Leader	Dr. Mohammed Odda Dawood	e-mail	ehsanphysician@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Mohammed Odda Dawood	e-mail	mohammedodda2017@uomustansiriyah.edu.iq
Peer Reviewer Name	Dr. Ehssan Salah Hassan	e-mail	ehsanphysician@uomustansiriyah.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	Electricity and Magnetism 2	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	- Study and Solving problems involving the interaction between the charges using Coulomb's Law. - To understand Electric field and Solving problems. - Study and Solving problems in Electric Potential and Electric Flux - Study and Solving problems by using the law in Capacitors and the law in Resistance.

	5. Study and Solving problems by using the law in Resistance. 6. Study and Solving problems by using the law in Direct Current Circuit.
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Learn about the composition of the atom and how to calculate the charge of the electron, proton and neutron. 2. How to use Coulomb's law to solve problems. 3. Studying the electric field and how to derive special laws and solve problems. 4. Study Motion of charged particles in a uniform Electric Field. 5. Studying electric flux and its derivatives, and solving problems. 6. Study Gauss's law and the application. 7. Study the Potential difference and Electric Potential and their applications. 8. Study Electric potential due to continuous charge distribution and Potential Gradient. 9. Study capacitors and solve problems. 10. Study the current and resistance and solve problems. 11. Study the Direct Current Circuit and solve problems.
Indicative Contents	Indicative content includes the following. <u>Part A - The Magnetic field and forces</u> Magnetism – Magnetic field line, Magnetic fields and forces, Right hand rule. Magnetic Flux and Gauss's Law for Magnetism. Motion of Charged Particles in a Magnetic Field, [15 hrs] Ampere' Law – Solenoid, Sources of Magnetic Fields. Magnetic Field of a Moving Charge, Magnetic Field Surrounding a Thin Straight Conductor, Magnetic Field Due to a Curved Wire Segment. [15 hrs] Magnetic Field on the Axis of a Circular Current Loop - The Magnetic Force between Two Parallel Conductors, Faraday's Law of Induction. [10 hrs] Induced emf and Electric Fields, Lenz's Law - Motional EMF, Self-Inductance, RL Circuits, Energy in a Magnetic Field, Mutual Inductance. Oscillations in an LC Circuit. [15 hrs] Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals The RLC Circuit, AC Sources, Resistors in an AC Circuit, Inductors in an AC Circuit, [15 hrs] The RLC Series Circuit and Resonance, Parallel RLC Circuit and Resonance. [7 hrs] Capacitors in an AC Circuit, Power in an AC Circuit. [15 hrs]

Learning and Teaching Strategies

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

Structured SWL (h/sem)	97	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	78	Unstructured SWL (h/w)	3
Total SWL (h/sem)	175		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	The structure of the atom , Properties of electric charges, Types of Charging and Coulomb's Law.
Week 2	Solve problems.
Week 3	Electric Field, Electric Field of A continuous charge distribution and Application.
Week 4	Electric dipole, Motion of charged particles in a uniform Electric Field, Electric Flux.
Week 5	Gauss's Law and Applications

Week 6	Solve problems.
Week 7	Potential Difference and Electric Potential, Electric Potential and Potential Energy Due to Point Charges and system of Point Charges, Electric potential due to continuous charge distribution and Applications.
Week 8	Solve problems.
Week 9	Capacitor, Dielectric between the plates, Connection of Capacitors, Energy Stored in a Capacitor, Electric Displacement $\vec{D}$ with Gauss's Law.
Week 10	Solve problems.
Week 11	Current and Resistance, Current density, Ohm's Law, Resistance and Temperature, Electrical Power.
Week 12	Solve problems.
Week 13	Direct Current Circuit, Electromotive Force, Connection of Resistors, Kirchhoff's Law, Potentiometer.
Week 14	Solve problems
Week 15	Examination
Week 16	Curriculum review

Delivery Plan (Weekly Lab. Syllabus)	
Week	Material Covered
Week 1	Lab 1: find the self-inductance coefficient of an inductor in an alternating current circuit containing an inductance and resistor
Week 2	Lab 2: Kirchhoff's law of electricity investigated
Week 3	Lab 3: Realization of Ohm's Law and Measurement of Specific Resistance
Week 4	Lab 4: Measuring electrical power in an alternating current circuit containing a coil and a lamp
Week 5	Lab 5: Frequency Response of RC Circuits
Week 6	Lab 6: Frequency Response of RLC Circuits
Week 7	Lab 7: Filters
Week 8	exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Electricity and magnetism R. MURUGESHAN, S. CHAND & COMPANY LIT, 1995.	Yes
Recommended Texts	Electricity and magnetism /3rd Edition/ EDWARD M. PURCELL AND DAVID J. MORIN, 2015.	Yes
Websites	Serway Solutions, Instructions Manual for Serway and Jewett Physics for Scientists and Engineers.	No

Grading Scheme

Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information			
Module Title	Differential mathematics	Module Delivery	
Module Type	<u>support</u>	☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar	
Module Code	PHY-113		
ECTS Credits	<u>6</u>		
SWL (hr/sem)	125		
Module Level	1		
Administering Department	02	College	01
Module Leader	Nadia Jaefar	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	This subject focuses on the study of single variable functions, limits, continuity, differentiation, graphs and applications of all these in physics
Module Learning Outcomes	1.Graph various kinds of functions and find limits, continuity of some functions. 2. Differentiate various kinds of functions and apply function differentiation on some problem in physics
Indicative Contents	

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	2
Total SWL (h/sem)	125		

Module Evaluation					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #6, #7
	Assignments	2	10% (10)	6 and 13	LO #3, #4 and #6, #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #12
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Introductory study of vector analysis: Scalar and vector products – Ternary scalar and vector products – Differentiation and integration of vectors – Gradient – Divergence – Convolution.
Week 2	Inertial frames of reference: Rectangular – Cylindrical – Spherical coordinate systems.
Week 3	Newton's laws of motion and their applications in inertial frames of reference: Work – Power
Week 4	Kinetic energy – Conservative forces fields – Potential energy – Conservation of energy.
Week 5	Impulse – Moment of rotation – Angular momentum – Conservation of angular momentum.
Week 6	Linear motion: Horizontal and vertical (free fall) under a constant force – Motion under the influence of friction force.
Week 7	Motion under the influence of a force varying with time.
Week 8	Motion under the influence of a force varying with time, position, and velocity.
Week 9	Planar motion: Projectiles motion – Circular motion.
Week 10	Gravity and rockets motion.
Week 11	Exam
Week 12	Introductory study of vector analysis: Scalar and vector products – Ternary scalar and vector products – Differentiation and integration of vectors – Gradient – Divergence – Convolution.
Week 13	Inertial frames of reference: Rectangular – Cylindrical – Spherical coordinate systems.
Week 14	Newton's laws of motion and their applications in inertial frames of reference: Work – Power
Week 15	Final exam
Week 15	- Sets and the subsets. - Methods of determine the set - Real numbers. - Intervals
Week 16	- Inequalities - Absolute value

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	"Calculus", Ross L. Finney, George B. Thomas, Jr., Addison Wesley Longman, 2000	Yes
Recommended Texts	1- "Introduction to Mathematical Philosophy", Bertrand Russell, 2009.	Yes
	2- "Techniques of Applied Mathematics", Andrew Fowler, 2005	Yes
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	General Astronomy	Module Delivery	
Module Type	<u>Support</u>	☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar	
Module Code	SCI-101		
ECTS Credits	<u>4</u>		
SWL (hr/sem)	125		
Module Level	1		
Administering Department	02	College	01
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Introduce basic concepts and principles of human rights. Introduce basic concepts and principles of human rights. Compare religious and ancient rights.
Module Learning Outcomes	Define human rights and key concepts Introduce basic concepts and principles of human rights. Compare religious and ancient rights
Indicative Contents	Definition of the human being, rights, and human rights Roots of human rights and their evolution throughout human history The development of the idea of protecting human rights in the modern era

Learning and Teaching Strategies	
Strategies	

Student Workload (SWL)			
Structured SWL (h/sem)	63	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	37	Unstructured SWL (h/w)	2
Total SWL (h/sem)	100		

Module Evaluation					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #6, #7
	Assignments	2	10% (10)	6 and 13	LO #3, #4 and #6, #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #12
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
Week	Material Covered
Week 1	Translated (English)
Week 2	General concept of human rights
Week 3	Definition of the human being, rights, and human rights

Week 4	Characteristics, features, and types of human rights
Week 5	Roots of human rights and their evolution throughout human history
Week 6	The development of the idea of protecting human rights in the modern era
Week 7	Human rights in ancient civilizations and divine laws
Week 8	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 9	The international community and contemporary human rights
Week 10	The International Bill of Human Rights
Week 11	International organizations and bodies concerned with the defense of human rights
Week 12	United Nations mechanisms for the protection of human rights
Week 13	Human duties and the limitations on the exercise of human rights
Week 14	International organizations and bodies concerned with the defense of human rights
Week 15	Professional ethics
Week 15	Student Disciplinary Code in Institutions of the Ministry of Higher Education and Scientific Research
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	yes
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Human Rights</u>	Module Delivery	
Module Type	<u>B</u>	☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	UNI-103		
ECTS Credits	<u>2</u>		
SWL (hr/sem)	<u>75</u>		
Module Level	UGx11 1	Semester of Delivery	1
Administering Department	02	College	01
Module Leader	Amjad Z. Taama	e-mail	amjadztatmsc@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit.

	3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchhoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents	Indicative content includes the following. <u>Part A - Circuit Theory</u> DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs] Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs]

	Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs]
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Learning and Teaching Strategies

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

Structured SWL (h/sem)	109	Structured SWL (h/w)	7
Unstructured SWL (h/sem)	91	Unstructured SWL (h/w)	6
Total SWL (h/sem)	200		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Translated (English)
Week 2	General concept of human rights
Week 3	Definition of the human being, rights, and human rights
Week 4	Characteristics, features, and types of human rights
Week 5	Roots of human rights and their evolution throughout human history

Week 6	The development of the idea of protecting human rights in the modern era
Week 7	Human rights in ancient civilizations and divine laws
Week 8	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 9	The international community and contemporary human rights
Week 10	The International Bill of Human Rights
Week 11	International organizations and bodies concerned with the defense of human rights
Week 12	United Nations mechanisms for the protection of human rights
Week 13	Human duties and the limitations on the exercise of human rights
Week 14	International organizations and bodies concerned with the defense of human rights
Week 15	Professional ethics
Week 16	Student Disciplinary Code in Institutions of the Ministry of Higher Education and Scientific Research

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>English Language</u>	Module Delivery	
Module Type	<u>Basic</u>	☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	UNI-102		
ECTS Credits	<u>2.00</u>		
SWL (hr/sem)	<u>100</u>		
Module Level	UGx11 1	Semester of Delivery	1
Administering Department	02	College	01
Module Leader	Assist.Prof.Dr. Hanan Auda Naif	e-mail	h.naif@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	- English language course combines grammar and practice, vocabulary development, and integrated skills with communication. - Authentic material from sources enables students to see new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills. 'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills, and a writing skills which is provides models for students to analyze and imitate.
Module Learning Outcomes	- Practice and develop language - Motivate students with new and updated texts, topics and tasks - Generate discussion with different topics, especially in the physics field. - The course provides not only material which helps the students to learn English in a different ways but it is also presented the ideas on how can the students learn English in a novel way."
Indicative Contents	The course contents two parts [30 hours], Grammar and vocabularies, each part contents 15 lectures [15 hours]. As well as, these parts include exercises on the skills of the English language such as: speaking, writing, reading, and listening.

Learning and Teaching Strategies

Strategies	During the 1 to 8 weeks of the course, the students will collect 60 vocabularies and study 15 lectures in the grammar part with homework and class exercises. Multiple quizzes will help to assess learning the material. There is first exam which covers the first 15 hours of the course. During the last 6 weeks of the course students will take 15 lectures but with advanced grammar, as well as, they will present report regarding the physical topics to increase the vocabularies in this field.
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Student Workload (SWL)

Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	12	Unstructured SWL (h/w)	1
Total SWL (h/sem)	75		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	5% (5)	3 , 6, 9 and 12	All
	Assignments	-	-	-	-
	Projects / Lab.	-	-	-	-
	Report	1	5% (5)	14	All
Summative assessment	Midterm Exam	2hr	20% (10)	8 and 15	All
	Final Exam	3hr	70% (70)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Introduction -Grammar (verb to be, questions tools, singular and plurals, numbers) - Vocabulary (everyday objects) - Exercises about the grammar. - Exercises to improve English speaking.
Week 2	- Grammar (pronoun, questions phrases) - Vocabulary (countries, adjectives and nouns). - Exercises about the grammar. - Exercises to improve English reading.
Week 3	- Grammar (negative, short answer) - Vocabulary (jobs, personal information). - Exercises about the grammar. - Exercises to improve English listening.
Week 4	- Grammar (present simple tense, adverbs of frequency, questions and negatives) - Vocabulary (sports, food and drinks, verb phrases, languages and nationalities). - Exercises about the grammar. - Exercises to improve English writing.
Week 5	- Grammar (present simple positive, present simple negative) - Vocabulary (the time, words that go together). - Exercises about the grammar. - Exercises to improve English speaking.
Week 6	- Grammar (question words, pronouns, subject , object, possessive, this and that) - Vocabulary (adjectives). - Exercises about the grammar. - Exercises to improve English reading.
Week 7	- Grammar (there is , there are, there isn`t, there aren`t, prepositions of place) - Vocabulary (rooms and furniture).

	- Exercises about the grammar. - Exercises to improve English writing.
Week 8	First exam
Week 9	- Grammar (was, were born, past simple tense, irregular verbs) - Vocabulary (saying years, have , do, go). - Exercises about the grammar. - Exercises to improve English listening.
Week 10	- Grammar (past simple – regular and irregular verbs, questions and negatives, time expressions) - Vocabulary (weekend activities, sport and leisure). - Exercises about the grammar. - Exercises to improve English speaking.
Week 11	- Grammar (can, can't, adverbs, requests and offers) - Vocabulary (verb- noun, adjective – noun, opposite adjective). - Exercises about the grammar. - Exercises to improve English reading.
Week 12	- Grammar (would like, some and any, like and would like) - Vocabulary (places in town, in a cafe). - Exercises about the grammar. - Exercises to improve English listening.
Week 13	- Grammar (present continuous, present simple and present continuous) - Vocabulary (colours, clothes, opposite verbs). - Exercises about the grammar. - Exercises to improve English writing.
Week 14	Grammar revision Vocabulary revision
Week 15	Second exam
Week 16	Final exam

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Headway: Beginner : Student's Book Book by Jo McCaul, John Soars, and Liz Soars 2022 This book has been approved by the ministry of higher education and scientific research.	No but it is available as PDF
Recommended Texts	English for Everyone Course Book Level 1 Beginner Rachel Harding · 2016 ·	No but it is available as PDF
Websites	https://rafieienglishclinic.com/upload/blog/Headway/beginner/480_5-%20Headway%20Beginner%20Teacher%27s%20Guide%2C%205th%20edition%20-%202019%2C%20232p.pdf	

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Material properties</u>	Module Delivery	
Module Type	<u>C</u>	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	PHY-121		
ECTS Credits	<u>8</u>		
SWL (hr/sem)	<u>175</u>		
Module Level	UGx11 2		
Administering Department	02	College	01
Module Leader	Dr.Inam Hatim	e-mail	Inamhatim73@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	The study of the mechanical properties of materials has a bright future. With the advancement of technology, the demand for materials with specific properties and increasing performance is increasing. Materials engineers use their technical knowledge to develop new materials and technologies to meet these changing needs.
Module Learning Outcomes	Materials science or materials engineering is an interdisciplinary field that includes the properties of matter and their applications in various fields of science and engineering. This science examines the relationship between the structure of materials and their properties, so it includes elements of applied physics and chemistry, as well as chemical, mechanical, civil and electrical engineering. With the increasing media interest in Nano science and nanotechnology in recent years, materials science has become at the forefront of science in many universities.

Indicative Contents	The course presents the basic concepts and principles of Elasticity for matter and fluid mechanics and its applications such as pressure of blood, the flow of water in cannels, the resistance of air against the motion of airplane. The course also describes the simple harmonic motion and its applications to some mechanical systems, such as the motion of simple pendulum and the frictionless motion of mass attached to an end of a spring. The course also deals with originating of wave motion which aims to study stationary acoustic waves, speed of sound in solid, liquid, gas, as well as to study Doppler's effect for acoustic waves.
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Learning and Teaching Strategies	
Strategies	The general use of composite materials depends largely on the mechanical and physical properties of these materials. Therefore, the study of these properties under the influence of forces and loads in different conditions is of great importance to know the suitability of these properties for the place of work of these materials

Student Workload (SWL)			
Structured SWL (h/sem)	93	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	82	Unstructured SWL (h/w)	2
Total SWL (h/sem)	175		

Module Evaluation					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #6, #7
	Assignments	2	10% (10)	6 and 13	LO #3, #4 and #6, #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #12
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Elasticity: Hooks law, stress and strain, Elastic modulus.
Week 2	Young modulus, tensile and compressive stress and strain, Bulk stress and stain.
Week 3	Shear stress and strain, problems.
Week 4	Fluid Mechanic: Definitions of fluid, density, pressure (definition and units) properties of pressure in static fluid, pressure depth, Pascal's law.
Week 5	Absolute pressure and gauge pressure, Archimedes' Principle and Buoyancy, surface tension.
Week 6	Capillarity, fluid flow, continuity equation Bernoulli's equation, Torricelli s theorem, problems Periodic Motion: Describing oscillation (Amplitude, period, frequency and angular frequency, simple harmonic motion (SHM)
Week 7	Comparing SHM with uniform circular motion graphical representation of SHM.
Week 8	Displacement, velocity, acceleration in SHM Energy in SHM, problems.
Week 9	Wave Motion: Periodic transverse and longitudinal waves, mathematical description of wave function for a sinusoidal wave.
Week 10	Particle velocity and acceleration in sinusoidal wave.
Week 11	Wave speed on a string, standing waves on a string, problems.
Week 12	Sounds waves and pressure fluctuations, speed of sound in (fluid, solid, gas).
Week 13	The decibel scale, sound intensity, standing sound waves.
Week 14	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Lab 1: Determination of Coefficient of Rigidity of Metallic Wire Dynamically.
Week 2	Lab 2: Determination of Young's Modulus for a Metallic.
Week 3	Lab 3: Determination the Viscosity of a Liquid by using the Stocks Method.
Week 4	Lab 4: Determination of the Coefficient of Rigidity of a Rod.
Week 5	Lab 5: Determination of the density of a liquid by using a loaded test-tune.
Week 6	Lab 6: Determination of the Frequency of a Tuning - Fork Using a Son meter.
Week 7	Lab 7: Boyle's Law.

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1. Serway and Jwett "Physics for Scientists and Engineers with Modern Physics"; 9th edition Thomson Learning Academic Resource center (2014). 2. Sears and Zemanskys "University Physics, thirteenth Edition, person, Addison Wesly (2012). 3. N. Subrohmanyam, Brijlal "Wave and Oscillations" second revised Edition, VIKAS Publishing House PVTLTD (2004).	No but it is available as PDF

	4. Fundamentals of Physics), written by Professor of Physics F. Bush at the University of Dayton, translated by Dr. Saeed Al-Jaziri and Dr. Muhammad Amin Suleiman (Cairo University) 1982.	
Recommended Texts	1. Robert C. Rich "College Physics." second Edition, new Grawhill (2002). 2. R.N. Chaudhuri "Wave and Oscillation" second Edition, New AGE international publishers (2010).	No but it is available as PDF
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A – Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C – Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E – Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Magnetism</u>	Module Delivery	
Module Type	<u>Core</u>	☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar	
Module Code	PHY-122		
ECTS Credits	<u>8</u>		
SWL (hr/sem)	<u>175</u>		
Module Level	2	Semester of Delivery	2
Administering Department	02	College	01
Module Leader	Dr. Ehssan Salah Hassan	e-mail	ehsanphysicyan@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Ehssan Salah Hassan	e-mail	ehsanphysicyan@uomustansiriyah.edu.iq
Peer Reviewer Name	Dr. Mohamed oda	e-mail	Mohamed @uomustansiriyah.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	Electricity	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	1. To develop problem solving skills and understanding of magnetism theory through the application of techniques. 2. To understand Magnetic field, Magnetic field line, Ampere' Law and Magnetic Field of a Moving Charge from a given Magnetic field line. 3. This course deals with the basic concept of magnetic and electricity. 4. This is the basic subject for all magnet and magnetic phenomena. 5. To understand magnetic field direction and faradays Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 12. Recognize how memetic theory works in magnetism. 13. List the various terms associated with magnetism. 14. Summarize what is meant by a basic magnetism. 15. Discuss the reaction and involvement of atoms in magnetism. 16. Describe magnetic field, charge, and Solenoid. 17. Define Ohm's law. 18. Identify the basic magnetic elements and their applications. 19. Discuss the operations of Sources of the Magnetic Field. 20. Discuss the various properties of resistors, capacitors, and inductors. 21. Explain the two Faraday's Law of Induction and Lenz's Law Motional EMF.
Indicative Contents	Indicative content includes the following. <u>Part A - The Magnetic field and forces</u> Magnetism – Magnetic field line, Magnetic fields and forces, Right hand rule. Magnetic Flux and Gauss's Law for Magnetism. Motion of Charged Particles in a Magnetic Field, [15 hrs] Ampere' Law – Solenoid, Sources of Magnetic Fields. Magnetic Field of a Moving Charge, Magnetic Field Surrounding a Thin Straight Conductor, Magnetic Field Due to a Curved Wire Segment. [15 hrs] Magnetic Field on the Axis of a Circular Current Loop - The Magnetic Force between Two Parallel Conductors, Faraday's Law of Induction. [10 hrs] Induced emf and Electric Fields, Lenz's Law - Motional EMF, Self-Inductance, RL Circuits, Energy in a Magnetic Field, Mutual Inductance. Oscillations in an LC Circuit. [15 hrs] Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals The RLC Circuit, AC Sources, Resistors in an AC Circuit, Inductors in an AC Circuit, [15 hrs] The RLC Series Circuit and Resonance, Parallel RLC Circuit and Resonance. [7 hrs] Capacitors in an AC Circuit, Power in an AC Circuit. [15 hrs]

Learning and Teaching Strategies

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

Structured SWL (h/sem)	109	Structured SWL (h/w)	7
Unstructured SWL (h/sem)	91	Unstructured SWL (h/w)	6
Total SWL (h/sem)	200		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Magnetism , Magnetic field line
Week 2	Magnetic fields and forces, Right hand rule.
Week 3	Magnetic Flux and Gauss's Law for Magnetism, Motion of Charged Particles in a Magnetic Field.

Week 4	Ampere' Law, Solenoid,
Week 5	Sources of Magnetic Fields, Magnetic Field of a Moving Charge
Week 6	Magnetic Field Surrounding a Thin Straight Conductor, Magnetic Field Due to a Curved Wire Segment
Week 7	Magnetic Field on the Axis of a Circular Current Loop, The Magnetic Force between Two Parallel Conductors
Week 8	Faraday's Law of Induction, Induced emf and Electric Fields, Lenz's Law.
Week 9	Motional EMF, Self-Inductance
Week 10	RL Circuits, Energy in a Magnetic Field
Week 11	Mutual Inductance, Oscillations in an LC Circuit
Week 12	Revision problem classes.
Week 13	The RLC Circuit, AC Sources
Week 14	Resistors in an AC Circuit, Inductors in an AC Circuit
Week 15	The RLC Series Circuit and Resonance, Parallel RLC Circuit and Resonance
Week 16	Capacitors in an AC Circuit, Power in an AC Circuit

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Lab 1: find the self-inductance coefficient of an inductor in an alternating current circuit containing an inductance and resistor
Week 2	Lab 2: Kirchhoff's law of electricality investigated
Week 3	Lab 3: Realization of Ohm's Law and Measurement of Specific Resistance
Week 4	Lab 4: Measuring electrical power in an alternating current circuit containing a coil and a lamp
Week 5	Lab 5: Frequency Response of RC Circuits
Week 6	Lab 6: Frequency Response of RLC Circuits
Week 7	Lab 7: Filters

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Electricity and magnetism R. MURUGESHAN, S. CHAND & COMPANY LIT, 1995.	Yes
Recommended Texts	Electricity and magnetism /3rd Edition/ EDWARD M. PURCELL AND DAVID J. MORIN, 2015.	Yes
Websites	Serway Solutions, Instructions Manual for Serway and Jewet Physics for Scientists and Engineers.	No

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	Mathematics Integration	Module Delivery	
Module Type	<u>support</u>	☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar	
Module Code	PHY-123		
ECTS Credits	<u>6</u>		
SWL (hr/sem)	125		
Module Level	1		
Administering Department	02	Semester of Delivery	1
Module Leader	Nadia Jaefar	College	01
Module Leader's Acad. Title		e-mail	
Module Tutor	Name (if available)	Module Leader's Qualification	Ph.D.
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	e-mail	
		Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	This subject focuses on the study of single variable functions, limits, continuity, differentiation, graphs and applications of all these in physics
Module Learning Outcomes	1.Graph various kinds of functions and find limits, continuity of some functions. 2. •Differentiate various kinds of functions and apply function differentiation on some problem in physics
Indicative Contents	

Learning and Teaching Strategies

Strategies

Student Workload (SWL)

Structured SWL (h/sem)	63	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	62	Unstructured SWL (h/w)	2
Total SWL (h/sem)	125		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #6, #7
	Assignments	2	10% (10)	6 and 13	LO #3, #4 and #6, #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #12
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Material Covered

	Material Covered
Week 1	Definition of functions
Week 2	Domain and Range
Week 3	Operations on functions
Week 4	Composition of functions
Week 5	Graph of functions- Types of graphs of the functions
Week 6	limit of functions

Week 7	Properties of limits.
Week 8	Finite and infinite limits.
Week 9	Limit of the rational functions.
Week 10	Continuous of functions.
Week 11	Differentiation- Definition of the derivative
Week 12	Rules of differentiation
Week 13	Slope of a straight line.
Week 14	Derivatives of the composite functions.
Week 15	The chain rule.
Week 16	Final exam

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	"Calculus", Ross L. Finney, George B. Thomas, Jr., Addison Wesley Longman, 2000	Yes
Recommended Texts	1- "Introduction to Mathematical Philosophy", Bertrand Russell, 2009.	Yes
	2- "Techniques of Applied Mathematics", Andrew Fowler, 2005	Yes
Websites		

Grading Scheme

Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Analytical Chemistry</u>	Module Delivery	
Module Type	<u>support</u>	☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☒ Practical ☒ Seminar	
Module Code	PHY-125		
ECTS Credits	<u>4.00</u>		
SWL (hr/sem)	<u>100</u>		
Module Level	<u>2</u>	Semester of Delivery	2
Administering Department	02	College	01
Module Leader	Dr.Jwan Oday Abdulsattar	e-mail	jwan.abdulsattar@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Assist. Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. Learn the fundamental concepts of analytical chemistry. 2. Identify chemical and biological mixture using qualitative and quantitative analysis. 3. Understanding the basics and principles of analytical chemistry, especially Qualitative and Quantitative analysis.

	4. Acquire knowledge of analytical chemistry analysis principles, procedures, and techniques such as gravimetric, volumetric and instrumental analysis. 5. Recognize different types of Stoichiometric calculation including molar, molal, formal, normal, and part per million concentration. 6. Know about basic buffer solution concepts and preparation. 7. Study important theories in acid and base in chemistry. 8. Learn about the recent development in analytical chemistry.
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Describe the basic information of analytical chemistry types. 2. Distinguish between different types of solutions based on amount of solute and based on particle size of solute. 3. Define buffer solution and their applicably in real experiments. 4. A full explain of acid-base theories for the solutions. 5. Differentiate between different analytical chemistry techniques. 6. A comprehensive explanation of the concept of Stoichiometric Calculations. 7. Know the application of analytical chemistry in real life.
Indicative Contents	Indicative content includes the following. <u>Part A - Analytical chemistry fundamentals</u> – Analytical chemistry theory, historical overview of analytical chemistry, definition of analytical chemistry, classification of analytical chemistry. [15 hrs] – Qualitative and Quantitative analysis, Volumetric analysis (Titrimetric analysis), Gravimetric analysis, and Instrumental analysis. [15 hrs] – Solutions: Classification of solutions according to the solute amount and solute particle size. [10 hrs] – Acid-Base theories: Arrhenius theory, Bronsted theory, and Lewis theory. [7 hrs] – Buffer solution. [8 hrs] <u>Part B- Stoichiometric Calculations</u> – Mole concept, Calculation the number of moles, the number of molecules, Molarity, Normality and Equivalent weight, Formality, Diluting solutions, and Molality concentration. [15 hrs] – Concentration in part per thousand, million, and billion, concentration by percent.[15 hrs] – The relationship between molarity, normality and part per million [7 hrs] – Group seminar and open class discussion [6 hrs]

Learning and Teaching Strategies

Strategies	Students learn about Analytical Chemistry through this course and textbook. In addition, discussion, activities, and on exams, students will be asked to apply knowledge that learned in a critical-thinking questions. Students will be engaged in discussion, Group activities, and seminar which help students to lead each other to success.
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Student Workload (SWL)

Structured SWL (h/sem)	63	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	37	Unstructured SWL (h/w)	1
Total SWL (h/sem)	100		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Introduction to analytical Chemistry, classification, historical view
Week 2	Definition of analytical chemistry
Week 3	Qualitative chemical analysis
Week 4	Methods and tools
Week 5	Quantitative chemical analysis (gravimetric, volumetric, and instrumental analysis)
Week 6	Classification of solutions
Week 7	Types of titrations (Neutralization, reduction-oxidation, complexation, precipitation)
Week 8	Acid-base theories

Week 9	Buffer solutions
Week 10	Recent development in analytical chemistry
Week 11	Stoichiometric calculation
Week 12	Formality and Molarity concentration
Week 13	Normality concentration and Molality
Week 14	Concentration in parts per thousand or million or billion and by percent
Week 15	The relationship between molarity, normality and part per million
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
Week	Material Covered
Week 1	Lab 1: Explanation of chemical safety and security conditions, tools, and materials.
Week 2	Lab 2: Explanation of quantitative analysis, volumetric analysis, and types of titration.
Week 3	Lab 3: Explanation of solution types.
Week 4	Lab 4: Preparation and standardization of (0.1M) HCL solution with Na ₂ CO ₃ .
Week 5	Lab 5: Determination of acetic acid content in vinegar.
Week 6	Lab 6: Preparation and standardization of(0.1M) NaOH solution with HCL.
Week 7	Lab 7: Practical final exam.

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Analytical Chemistry” by Gary D. Christian, 6th Edition, 2004, John Wiley and Sons, Inc.	Yes
Recommended Texts	An Introduction to Analytical Chemistry” by Douglas A. Skooge & Donald M. West, 4th Edition, 1986.	Yes
Websites		

Grading Scheme

Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Democracy</u>	Module Delivery	
Module Type	<u>B</u>	☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar	
Module Code	UNI-101		
ECTS Credits	<u>2</u>		
SWL (hr/sem)	<u>33</u>		
Module Level	UGx11 1		
Administering Department	02	College	01
Module Leader	Ghassan Kareem mijthab Amjad Z. Taama	e-mail	drghassankareem@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Amjad Z. Taama	e-mail	amjadztatmsc@uomustansiriyah.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	

	.1Introducing students to the meaning of the term democracy and the democratic system, as well as increasing their knowledge of the theoretical and conceptual aspects and historical development of democracy. .2Enabling students to exercise their rights effectively through comprehensive personal development consistent with the values of a democratic society. .3Developing students' skills and awareness regarding democracy and its impact on society. .4Understanding and deriving the most prominent global experiences related to democracy, and attempting to derive what can be applied in our local communities. Introducing the constitution, elections, and prominent electoral experiences, and motivating .5 ..students to recognize the importance of active participation in political life
Module Learning Outcomes	-1Defining Democracy -2Identifying the Forms and Concepts of Democracy -3Reviewing the Roots and History of Democracy -4Shedding Light on the Constitution and Democracy -5Understanding the Meaning of Genocide -6Identifying the Guarantees That Ensure a Democratic System
Indicative Contents	

Learning and Teaching Strategies	
Strategies	The main strategy adopted in delivering this course will focus on encouraging students to embrace topics related to human rights and to improve some of the skills associated with them. This will be achieved through interactive educational programs or by adopting modern teaching .methods

Student Workload (SWL)			
Structured SWL (h/sem)	109	Structured SWL (h/w)	7
Unstructured SWL (h/sem)	91	Unstructured SWL (h/w)	6
Total SWL (h/sem)	200		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	)10% (10	5 and 10	LO #1, #2 and #10, #11
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	)70% (70	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Translated (English)
Week 2	The concept and meaning of democracy
Week 3	Forms and types of democracy
Week 4	Historical background of democracy
Week 5	Characteristics and advantages of the democratic system
Week 6	Main components of democracy
Week 7	The constitution and democracy
Week 8	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 9	The Permanent Constitution of the Republic of Iraq 2005
Week 10	Elections
Week 11	Civil society institutions and democracy
Week 12	The relationship between human rights and democracy
Week 13	Genocide crimes and some global examples
Week 14	Guarantees of public rights and freedoms
Week 15	Safeguards that ensure the democratic system
Week 16	Good governance

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	Lectures on Human Rights and Democracy	نعم
Recommended Texts	Human Rights, Democracy, and Public Freedoms	نعم
Websites		

Grading Scheme

Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Second stage

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Analytical mechanics1</u>	Module Delivery	
Module Type	<u>Basic</u>	☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>4</u>		
SWL (hr/sem)	<u>100</u>		
Module Level	1UGx11	Semester of Delivery	1
Administering Department	Department of physics	College	College of sience
Module Leader	Sahar Issa Saeed Waleed Salah	e-mail	dr.sahar.phy@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	none	e-mail	E-mail
Scientific Committee Approval Date	2024/2025	Version Number	

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Analytic mechanics play an important role in study the motion of rigid bodies , this subject aims to complete study of the classical mechanical laws in order to develop the student abilities to understand the function of various mechanical systems
Module Learning Outcomes	Course Intended Outcomes: On the completion of this subject , the student is expected to be able to : 1- Derive and explain the conservations laws of momentum and energy , and use them in different applications . 2- Derive the laws of rotation motion and apply them to the motion of planets and satellite .

	3- Describe the action of centripetal forces. 4- Calculate the components of the moment of inertia for different shapes . 5- Describe Lagrange's and Hamiltonian's principles. 6- Understand Lagrange's and Hamiltonian's equation and use them in different application . 7- Use relative formulas to define force, momentum, and energy..
Indicative Contents	Indicative content includes the following. <u>1-</u> Describing the principles and law theoretically <u>2-</u> Deriving the equations mathematically. <u>3-</u> Solving example problems to show how equation can be applied.

Learning and Teaching Strategies

Strategies	The lectures are divided in to six chapters .The subject starts to complete the study of Fundamental Concept. Vectors. And Newtonian Mechanics.Rectilinear motion of a particle .And the harmonic Oscillator. And the study of Kepler's laws as an application to the universal of gravitation . The subject also describes Lagrange's and Hamiltionian's equation and their application and links between classical mechanical and the special theory of relativity
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Student Workload (SWL)

Structured SWL (h/sem)	70	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	25	Unstructured SWL (h/w)	1
Total SWL (h/sem)	100		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	1%		
	Report	4	4%		
Summative assessment	First Exam	25	25%		
	Final Exam	70	70% (70)		
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Fundamental concepts .vectors. scalar product, vector product
Week 2	The triple product .unit coordinate vectors ,projection
Week 3	The projectile motion, circular motion ,rolling wheel
Week 4	The transformation matrix. velocity and acceleration in plane polar , cylindrical and spherical coordinates.
Week 5	Newtonian mechanics .rectilinear motion of a particle,
Week 6	Forces that depend on position – escape speed .
Week 7	The forces as a function of time .the jerk
Week 8	Solve problems with first examination
Week 9	Velocity – dependent forces .Fluid resistance and terminal velocity
Week 10	The Harmonic oscillator ,simple harmonic motion
Week 11	The simple pendulum ,the energy function of the simple pendulum
Week 12	Damped harmonic motion, over damping ,critical damping.
Week 13	Underdamping , energy considerations
Week 14	Forced harmonic motion , resonance
Week 15	Solve problems with 2nd examination .
Week 16	The final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1-"Analytical Mechanics ",G.R.Fowels,2013. 2-"Classical Dynamics" by J.B. Marion,2010	available
Recommended Texts	1-Analytical Mechanics. Louis N. Hand ,Janet D.Finch, Cambridge University Press. 2- Classical Mechanics, H. Goldstein, Charles P.Poole, John L.Safko, Pearson Higher Education .	available
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Digital Electronics</u>	Module Delivery	
Module Type	<u>Core</u>	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	UGx11 1	Semester of Delivery	1
Administering Department	Department of Physics	College	College of Science
Module Leader	Asst. Prof. Dr. Emad Hameed Hussein Asst. Prof. Dr. Khaldoon Naji Abbas	e-mail	emad.h@uomustansiriyah.edu.iq khnaa@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Asst. Prof. Dr. Emad Hameed Hussein Asst. Prof. Dr. Khaldoon Naji Abbas	e-mail	emad.h@uomustansiriyah.edu.iq khnaa@uomustansiriyah.edu.iq
Peer Reviewer Name	Asst. Prof. Dr. Emad Hameed Hussein	e-mail	emad.h@uomustansiriyah.edu.iq
Scientific Committee Approval Date		Version Number	

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives

Students will have principles of digital electronics.

Preparing specialists in the field of digital electronics and its practical applications, which bears the responsibility of studying the country's need for development and progress and capable of meeting the needs of the job market in state institutions and industry sectors.

Preparing an educated generation armed with science and adopts it as a sound basis to bring about radical changes and assign scientific knowledge and scientific methods in thinking, analysis and adaptation with the development of technologies, to keep up with the expansion of human needs.

Effective contribution for deepening and documenting the connection of the university with the society through the implementation of advisory counseling, training and development of teaching and administrative staff.

The service of preparing graduates specialized in physics who contribute to development in the country.

Meeting the needs of various sectors with highly qualified personals in the field of physics.

Encouraging the distinguished in this field to work as teaching assistants in the department to be part of the academic teaching staff in the future.

Module Learning Outcomes

A. Cognitive goals

1. To enable students to understand the basics of digital electronics.
2. To let students be able to understand electronics phenomena from a mathematical point of view.
3. Enable students to understand the basics of digital electronics through the use of modern software and keeping pace with scientific development.
4. Enable students to obtain knowledge, understand the scientific ideas of digital electronics and its practical applications, logical and scientific analysis, and the interpretation of behaviors.

B. The skills goals special to the program

1. Sound scientific research skills and constructive scientific discussions and expressing of opinions.
2. Use and development the skills.
3. Thinking skills and enabling the student to understand and solve scientific problems related to the laws of physics.
4. Skills and ability to apply the theoretical and practical scientific experience, gained from his studies, in the areas of practical life; taking into account industrial and commercial constraints.

Indicative Contents

The course is aimed at learning students one of the most important basics of physics, which includes a lot of basics that must be known by students

	specializing in physics and making them able to understand these basics and logical and scientific analysis in the interpretation of electronics information, as well as enabling the student to solve issues related to electronics issues.
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Learning and Teaching Strategies	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)			
Structured SWL (h/sem)		Structured SWL (h/w)	
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
Total SWL (h/sem)			

Module Evaluation					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Binary-Number and Decimal-Number Systems
Week 2	Basic Logic Gates
Week 3	Universal Logic Gates
Week 4	Boolean Algebra
Week 5	Diode-Resistor Logic (DRL) Diode-Transistor Logic (DTL) Transistor -Transistor Logic (TTL)
Week 6	Solved Examples
Week 7	Exam-1
Week 8	Karnaugh Maps (KM): Two-variables KM Three-variables KM Four-variables KM
Week 9	Combinational Logic Circuit (CLC)
Week 10	Binary Adders: Half Adder Full Adder
Week 11	Binary Subtractor: Half Subtractor Full Subtractor
Week 12	Multiplexer
Week 13	Flip-Flop (F-F): R-S F-F J-K F-F
Week 14	Flip-Flop (F-F): D F-F T F-F
Week 15	Solved Examples
Week 16	Exam-2

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Basic Logic Gates
Week 2	Universal Logic Gates
Week 3	Logic Gates using Diode-Resistor Logic (DRL)
Week 4	Satisfaction of Boolean Algebra
Week 5	Exam-1
Week 6	Half Adder
Week 7	Full Adder
Week 8	Half Subtractor

Week 9	Full Subtractor
Week 10	Exam-2

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	1- Thomas L. Floyd, Digital Fundamentals, Pearson, 11 Ed., 2015.	Online as Pdf.
Recommended Texts	2- Daniel Adam Steck, Analog and Digital Electronics, University of Oregon, 2017.	Online as Pdf.
Required Texts	3- Subir K. Sarkar, Asish K. De, Souvik Sarkar, Foundation of Digital Electronics and Logic Design, Taylor & Francis Group, 2014.	Online as Pdf.
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Analog electronics</u>	Module Delivery	
Module Type	<u>Core</u>	☒ Theory Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	UGx11	Semester of Delivery	1
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr. Asaad Mjbel Abbas Dr. jasim shamki alikhan	e-mail	Asaadmjbel@uomustansiriyah.edu.iq jshamki@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Assist Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	The educational objectives of this course are: 8. Understand the meaning and basic components of analog electronics. 9. Learn the basics of analogue electronic signals and their characteristics. 10. Knowledge of electrical semiconductor materials, the energy bands in which they are found, how electrons are distributed in them, and how the majority of charge carriers are in these materials.

	11. Knowledge of diode, how to bias a diode, circuit analysis of forward and reverse bias, band gap alignment and Shockley equation 12. To learn voltage correction: half-wave rectifier, full-wave rectifier, and bridge rectifier 13. Knowledge of voltage filtering: RC filter and LC filter 14. Knowledge of Zener diode and transistor
Module Learning Outcomes	1 Apply circuit laws, theorems and methods of systematic analysis to predict the steady state behaviour of circuits. 2 Explain the operation of analog circuits 3 Use piecewise linear models to predict the steady state behaviour of simple diode and transistor circuits,. 4. Simulate simple analog circuits to verify their behaviour. 5 Explain the transient behaviour of diode, rectifier, and transistor 6 Students will have practical knowledge of the use of electronic circuits
Indicative Contents	This course will enable the students to understand the basics of construction, working, and applications of various types of electronic components and understand clearly the principles and functioning of the basic analogue components and circuits, which includes the understanding of analogue signal model and Identify the concept of majority and minority charge carriers and their distribution within energy band and Understand the concepts, structure and types of analogue electronic circuits also, Students will have practical knowledge of the use of electronic circuits and Identify the diode, rectifier, and transistor therefore one of the basic core courses which is must for every electronic engineer and hence should be taken very sincerely by students.

Learning and Teaching Strategies

Strategies	This course uses content in-person lectures, workshops, and practicals to achieve its learning objectives. Lectures set the scene and cover important foundations at the start of the course and for each new topic. The online pre-recorded presentations focus on key concepts and are supported by practice exercises to test and develop understanding. Workshops involve working in small groups on a variety of problems including theory problems, benchtop experiments and simulations. There is a small assessment component for active participation in workshops. Practical provide an opportunity to consolidate understanding and to develop hands-on skills with prototyping, testing and measurement.
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Student Workload (SWL)			
Structured SWL (h/sem)	5	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	4	Unstructured SWL (h/w)	1
Total SWL (h/sem)	14		

Module Evaluation					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	11, #10LO #1, #2 and #
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7,
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5 #8 #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
Week	Material Covered
Week 1	Introduction Analog and Digital Signals: Sinusoidal Signal Rectangular Signal. Amplitude, Frequency, Duration Repetition Duty Cycle
Week 2	Exercises and Discussion
Week 3	Energy Bandgap Theory Insulators, Conductors & Semiconductors
Week 4	Intrinsic and Extrinsic Semiconductors
Week 5	Exercises and Discussion
Week 6	P-N Junction Diode Diode Biasing & Circuit Analysis: Forward & Reverse Bias Energy Band Alignment

Week 7	Shockley Equation I-V Characteristics Quality Factor Series and Dynamic Resistances
Week 8	Dc Power Supply: Voltage Rectification: Half-Wave Rectifier Full-Wave Rectifier & Bridge Rectifier
Week 9	Voltage Filtration: RC-Filter LC-Filter Zener Diode: I-V Characteristics
Week 10	Voltage Regulation: Zener Diode as Regulator Regulators IC 7805 IC 7812 IC 7905
Week 11	Exercises and Discussion
Week 12	Optoelectronic Devices Photo-diode Photo-resistor Light Emitting Diode (LED)
Week 13	Laser Diode LCD Display
Week 14	Solar Cell: Overview and Fabrication I-V Characteristics Efficiency Tandem Solar Cell Structure
Week 15	Exercises and Discussion
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Electronic components & Analog and Digital Signals
Week 2	V – I) Characteristics of P-N Junction Diodes 1 (
Week 3	P-N Junction Diodes 2
Week 4	Discussion
Week 5	Half-Wave Rectifier
Week 6	Center-Tapped Full-Wave Rectifier
Week 7	Mid Exam
Week 8	Rectifier part 2
Week 9	(Full-Wave Bridge Rectifier (FWBR
Week 10	Smoothing Half-Wave Rectifier Output

Week 11	Discussion
Week 12	Smoothing Full-Wave Rectifie
Week 13	Zener Diode
Week 14	Transistor
Week 15	Final Exam

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Electronic Devices, Thomas L. Floyd, 9th Ed., Pearson Education international, New Jersey, 2012.	No but it is available as PDF
Recommended Texts	Basic Electronics for Scientists and Engineers, Dennis L. Eggleston, Cambridge Uni. Press, UK., 2011	No but it is available as PDF
Recommended Texts	Introduction to Electronics, Bob Zulinski, Michigan Technological University, 2nd Ed., 1999.	
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Computers2</u>	Module Delivery	
Module Type	<u>Basic</u>	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>3</u>		
SWL (hr/sem)	<u>75</u>		
Module Level	UGx11 1		
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Ahlam M. Kadhim	e-mail	ahlamajead@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Ahlam M. Kadhim	e-mail	ahlamajead@uomustansiriyah.edu.iq
Peer Reviewer Name	Eman A. Saad	e-mail	eman_abduljabbar@uomustansiriyah.edu.iq
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Understand the meaning and basic concept of MATLAB programming language. Learning code generation by writing programs and performing the practical application. Knowledge of tools and their properties to write program code and use them to design different programs in physics and mathematics applications. Drawing vectors and matrices of physical and mathematical functions in MATLAB and using the variables for programming. Identify errors in programming and repair.

	Identify between matrices and vectors in MATLAB language program processes in mathematics and physics.
Module Learning Outcomes	At the end of the course: The student learns programming Matlab and how the announcement of the variables used for programming That can identify errors in programming and repair. Dealing with matrices and the method of introduction and conducting operations in mathematics.
Indicative Contents	indicative content includes the following. <u>part a – introduction to matlab language</u> starting Matlab, Matlab windows, working in the command window 9, arithmetic operations with scalars, order of precedence, using Matlab as a calculator, display formats, elementary math built-in functions, defining scalar variables, the assignment operator, rules about variable names, predefined variables and keywords, useful commands for managing variables [4 hrs]. script files, notes about script files, creating and saving a script file, running (executing) a script file, current folder, addition and subtraction, array multiplication, array division element-by-element operations, using arrays in MATLAB built-in math functions, built-in functions for analyzing arrays [20 hrs] revision problem classes [3 hrs] <u>part b – programming in Matlab language</u> creating a one-dimensional array (vector), creating a two-dimensional array (matrix), the zeros, ones, and, eye commands, notes about variables in Matlab, the transpose operator, array addressing, vector, matrix, using a colon: in addressing arrays, adding elements to existing variables, deleting elements, built-in functions for handling arrays, strings, and strings as variables, problems. [12 hrs] the plot command, the plot of given data, plot of a function, the fplot command, plotting multiple graphs in the same plot, using the plot command, using the hold on and hold off commands, using the line command, formatting a plot, formatting a plot using commands, formatting a plot using the plot editor, plots with logarithmic axes, plots with error bars, plots with special graphics, histograms, polar plots, putting multiple plots on the same page, multiple figure windows. [12 hrs] polynomials, the value of a polynomial, roots of a polynomial, addition, multiplication, and division of polynomials, derivatives of polynomials, curve fitting content, curve fitting with polynomials; the poly fitting function, curve fitting with functions other than polynomials, interpolation, the basic fitting interface, examples of Matlab applications. [12 hrs]

Learning and Teaching Strategies

Strategies

During the 5-8 weeks of the course, the students will learn How to differentiate between the different components of the computer and how to deal well with the MATLAB program, with homework and class exercises to reinforce the material learned in class. Multiple quizzes will help to assess learning the material. There is one midterm which covers the first part of the course. During the last 6 weeks of the course, students will use their knowledge to work on a project related to atmospheric sciences. This will involve the use and write programs to solve physics and mathematics equations. Team projects will be set throughout the stages of the course.

Student Workload (SWL)

Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	12	Unstructured SWL (h/w)	1
Total SWL (h/sem)	75		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #6, #7
	Assignments	2	10% (10)	6 and 13	LO #3, #4 and #6, #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #12
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	General Concepts of MATLAB Programs and Data Types and Variables
Week 2	MATLAB Mathematical Functions and Visual Basic functions and formulas
Week 3	Arrays and Matrices: Defining Scalar Variables, Script Files, Creating Vector and Matrix, Commands for Building Arrays and Matrices, Matrix and Array Operations, Strings and Strings as Variables
Week 4	Two-Dimensional Plots: The Plot Command, The Function Plot Command, Plotting.
Week 5	Plots with Special Graphics.

Week 6	Formatting a Plot, Plots with Logarithmic Axes, Plots with Error Bars.
Week 7	Plots with Special Graphics, Polar Plots.
Week 8	Three-Dimensional Plots Line Plots, Mesh, and Surface Plots
Week 9	Multiple Graphs in the Same Plot.
Week 10	Polynomials function.
Week 11	Curve Fitting with Polynomials.
Week 12	The Switch-Case Statement, Loops, Nested Loops, Nested Conditional Statements, and The Break and Continue Commands.
Week 13	The if-end Structure.
Week 14	Examples of physical and mathematical applications in MATLAB.
Week 15	The View Command.
Week 16	Preparatory week before the Final Exam.

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Lab 1: Showing Computer System Components and the connection between them, Input and Output devices, teach the students to use the mouse, keyboard
Week 2	Lab 2: View the user interface of MATLAB and the contents of the interface of the operating system.
Week 3	Lab 3: Components of MATLAB interface, icons, types of icons, taskbar, activating windows.
Week 4	Lab 4: Starting MATLAB interface, and title bar components.
Week 5	Lab 5: Title Bar, Menu Bar, Tool Bar, FORMAT, Active Window, Status Bar.
Week 6	Lab 6: Typing the texts and formatting in MATLAB.
Week 7	Lab 7: Basic functions and formulas in MATLAB language.
Week 8	Lab 8: writing program codes for 1-D and 2-D matrices.
Week 9	Lab 8: plotting graph for some physical function.
Week 10	Lab 10: Examples of relational and logical operators.

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	PROGRAMMING WITH VISUAL BASIC, Professor Emeritus, University of Pittsburgh, Copyright © 2001 by The McGraw-Hill Companies.	No, but it is available as PDF
Recommended Texts	PROGRAMMING WITH MICROSOFT® VISUAL BASIC® 2017, Copyright 2018 Cengage Learning. All Rights Reserved. May not be copied, scanned, or duplicated, in whole or in part. WCN 02-200-203.	No, but it is available as PDF
Required Texts	Calculus Differential Equation With MATLAB. Department of Mechanical Engineering Chulalongkorn University, Bangkok Copyright © 2016	No, but it is available as PDF
Websites	https://www.mathworks.com/help/?s_tid=gn_supp	

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work is required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Mathematical Physics 3</u>	Module Delivery	
Module Type	<u>Support</u>	☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>3</u>		
SWL (hr/sem)	<u>75</u>		
Module Level	UGx11 1	Semester of Delivery	1
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Fatin E. M. Al-Obaidi	e-mail	E-mail
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	Sci.phy.fam@uomustansiriyah.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	The objectives of mathematical vector analysis involve understanding and manipulating vectors, which are mathematical objects with both magnitude and direction. Vector analysis is a fundamental tool in various fields such as physics, engineering, computer science, and mathematics itself. The primary objectives of vector analysis include: 1. Understanding Vectors and Their Properties: Learn about the basic properties of vectors, such as magnitude and direction, and how they differ from scalar quantities. This includes understanding the concepts of unit vectors, zero vectors, and the direction cosines.

	2. Vector Operations: Develop proficiency in performing vector operations, including addition, subtraction, scalar multiplication, dot (scalar) product, cross (vector) product, and triple products. These operations are foundational for many applications in physics and engineering. 3. Coordinate Systems and Transformations: Understand different coordinate systems (Cartesian, cylindrical, and spherical) and how vectors transform between these systems. This is crucial for solving problems in different geometries. 4. Differentiation and Integration of Vectors: Learn how to differentiate and integrate vector functions, which is essential for analyzing motion, electromagnetic fields, fluid flow, and other physical phenomena. 5. Vector Fields: Study vector fields and their properties, such as divergence, curl, and gradient. This involves understanding concepts like line integrals, surface integrals, and volume integrals. These are essential in fields such as electromagnetism, fluid dynamics, and thermodynamics. 6. Applications in Physics and Engineering: Apply vector analysis to solve problems in physics (e.g., mechanics, electromagnetism) and engineering (e.g., stress analysis, fluid mechanics). This includes understanding how forces, velocities, accelerations, and other physical quantities can be represented and manipulated as vectors.
Module Learning Outcomes	1. Be able to identify when to use vector operator and coordinates. 2. Students will master concepts and solve problems in vector analysis; line integrals, surface integrals. 3. Be able to compute Greens theorem, Stokes' theorem, Divergence or Gauss' Theorem.
Indicative Contents	REVIEW OF VECTOR ALGEBRA, including 5 examples VECTOR DIFFERENTIATION, including 16 examples Curvilinear Coordinates cylindrical coordinates, including 13 examples MULTIPLE INTEGRALS, including 25 examples VECTOR INTEGRATION, including 18 examples THE GREEN'S, DIVERGENCE AND STOKES' THEOREMS, including 25 examples

Learning and Teaching Strategies

Strategies	During the 1-6 weeks of the course, the students will learn how to use ∇, grad, and divergence with homework and class exercises to reinforce the material that learned in class. Multiple quizzes will help to assess learning the material. There is one midterm which covers the first part of the course. During the last 6 weeks of the course students will use their knowledge to work on a project related to the topic of the material. Team projects will be set throughout the stages of the course.
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Student Workload (SWL)

Structured SWL (h/sem)	45	Structured SWL (h/w)	3
Unstructured SWL (h/sem)	15	Unstructured SWL (h/w)	1
Total SWL (h/sem)	60		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	2-6	Some selected problems
	Assignments	2	30% (10)	7-9	Some selected problems
	Projects / Lab.	-	-	-	-
	Report	1	10% (10)	10	Selected object
Summative assessment	Midterm Exam	3hr	20% (20)	7	Selected material
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	REVIEW OF VECTOR ALGEBRA vector, scalar, vector algebra, Scalar and vector fields
Week 2	dot and cross product, Triple products, reciprocal set of vectors
Week 3	VECTOR DIFFERENTIATION
Week 4	Vector operators (gradient, divergence, curl and Laplacian)
Week 5	Curvilinear Coordinates cylindrical coordinates
Week 6	Spherical coordinates and General curvilinear coordinates
Week 7	MULTIPLE INTEGRALS Double and Triple integrals
Week 8	Change of variables in multiple integrals (Jacobian of transformation)
Week 9	Applications of multiple integrals (Areas and volumes, Masses, centres of mass and Moments of inertia)
Week 10	Solved problems
Week 11	VECTOR INTEGRATION Ordinary integrals of vectors
Week 12	Line, surface and volume integrals
Week 13	THE GREEN'S, DIVERGENCE AND STOKES' THEOREMS Green's theorem in a plane
Week 14	Divergence theorems and its applications
Week 15	Stokes' theorem and its applications

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	None
Week 2	None
Week 3	None

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	K. F. Riley, M. P. Hobson, and S. J. Bence, <i>Mathematical methods for physics and engineering: A comprehensive guide</i> . Cambridge, England: Cambridge University Press, 2006.	No but it is available as PDF
Recommended Texts	K. F. Riley and M. P. Hobson, <i>Essential mathematical methods for the physical sciences</i> . Cambridge, England: Cambridge University Press, 2012	No but it is available as PDF
Required Texts	Ruby and M. Mandal, “The geometrical and physical interpretation of fractional order derivatives for a general class of functions,” <i>Math. Methods Appl. Sci.</i> , vol. 47, no. 11, pp. 8400–8420, 2024.	No but it is available as PDF
Websites		

Grading Scheme

Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Mathematical Physics II</u>	Module Delivery	
Module Type	<u>Basic</u>	☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>4</u>		
SWL (hr/sem)	<u>100</u>		
Module Level	UGx11	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Fatin E. M. Al-Obaidi	e-mail	E-mail
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	Sci.phy.fam@uomustansiriyah.edu.iq
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objective	The aim of this module is to provide students with a thorough understanding of the concepts and methods for solving ordinary differential equations (ODEs). Students will explore various techniques for analyzing and solving differential equations, learn about their applications in real-world scenarios, and develop the mathematical skills necessary to solve advanced problems involving higher-order and linear differential equations. On successful completion of this module, students will be able to:

	1. Understand and describe the fundamental concepts of differential equations, including their classification and general solution forms. 2. Solve first-order differential equations using methods such as separable variables, exact equations, integrating factors, and specific transformations (e.g., Bernoulli and isobaric equations). 3. Apply techniques to solve higher-degree first-order equations and analyze their practical applications in real-world contexts. 4. Solve higher-order ordinary differential equations, including linear equations with constant and variable coefficients. 5. Use advanced solution methods such as the Laplace transform and Green's functions to solve differential equations. 6. Apply the Frobenius method to obtain series solutions for equations with regular singular points. 7. Formulate and solve problems involving differential equations in engineering, physics, and other fields, demonstrating an ability to link theory to application.
Module Learning Outcomes	On successful completion of this module, students will be able to: 4. Understand and describe the fundamental concepts of differential equations, including their classification and general solution forms. 5. Solve first-order differential equations using methods such as separable variables, exact equations, integrating factors, and specific transformations (e.g., Bernoulli and isobaric equations). 6. Apply techniques to solve higher-degree first-order equations and analyze their practical applications in real-world contexts. 7. Solve higher-order ordinary differential equations, including linear equations with constant and variable coefficients. 8. Use advanced solution methods such as the Laplace transform and Green's functions to solve differential equations. 9. Apply the Frobenius method to obtain series solutions for equations with regular singular points. 10. Formulate and solve problems involving differential equations in engineering, physics, and other fields, demonstrating an ability to link theory to application.
Indicative Contents	Concepts of differential Equations, General form of solution First-degree first-order equations, Separable-variable and Exact equations Inexact, integrating factors and Linear equations Homogeneous, Isobaric and Bernoulli's equations Problems and applications Higher-degree first-order equations and their applications Higher-order ordinary differential equations Linear equations with constant coefficients Solution from complementary function and particular integral Laplace transform method Linear equations with variable coefficients Legendre and Euler linear equations and Green's functions Problems and applications

	Series solutions of differential equations
	Regular singular point and Frobenius method

Learning and Teaching Strategies

Strategies	During the 1-6 weeks of the course, the students will learn how to use methods to solve, classify ordinary differential equations and use the Laplace transform to compute solutions of equations involving impulse functions with homework and class exercises to reinforce the material that learned in class. Multiple quizzes will help to assess learning the material. There is one midterm which covers the first part of the course. During the last 6 weeks of the course students will use their knowledge to work on a project related to the topic of the material. Team projects will be set throughout the stages of the course.
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Student Workload (SWL)

Structured SWL (h/sem)	45	Structured SWL (h/w)	3
Unstructured SWL (h/sem)	15	Unstructured SWL (h/w)	1
Total SWL (h/sem)	60		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	2-6	Some selected problems
	Assignments	2	30% (10)	7-9	Some selected problems
	Projects / Lab.	-	-	-	-
	Report	1	10% (10)	10	Selected object
Summative assessment	Midterm Exam	3hr	20% (20)	7	Selected material
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Concepts of differential Equations, General form of solution
Week 2	First-degree first-order equations, Separable-variable and Exact equations

Week 3	Inexact, integrating factors and Linear equations
Week 4	Homogeneous, Isobaric and Bernoulli's equations
Week 5	Problems and applications
Week 6	Higher-degree first-order equations and their applications
Week 7	Higher-order ordinary differential equations
Week 8	Linear equations with constant coefficients
Week 9	Solution from complementary function and particular integral
Week 10	Laplace transform method
Week 11	Linear equations with variable coefficients
Week 12	Legendre and Euler linear equations and Green's functions
Week 13	Problems and applications
Week 14	Series solutions of differential equations
Week 15	Regular singular point and Frobenius method

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	None
Week 2	None
Week 3	None

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	K. F. Riley, M. P. Hobson, and S. J. Bence, <i>Mathematical methods for physics and engineering: A comprehensive guide</i> . Cambridge, England: Cambridge University Press, 2006.	No but it is available as PDF
Recommended Texts	K. F. Riley and M. P. Hobson, <i>Essential mathematical methods for the physical sciences</i> . Cambridge, England: Cambridge University Press, 2012	No but it is available as PDF
Required Texts	Ruby and M. Mandal, "The geometrical and physical interpretation of fractional order derivatives for a general class of functions," <i>Math. Methods Appl. Sci.</i> , vol. 47, no. 11, pp. 8400–8420, 2024.	No but it is available as PDF
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Modern Physics1</u>	Module Delivery	
Module Type	<u>Core</u>	☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	UGx11 1	Semester of Delivery	1
Administering Department	Physics dDepartmet	College	College of Science
Module Leader	Assist.Prof.Dr. Hanan Auda Naif Lecturer Dr. Fatin Hameed	e-mail	h.naif@uomustansiriyah.edu.iq fakt_2006@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Assist.Prof. Dr. Hanan Auda Naif Lecturer Dr. Fatin Hameed	e-mail	h.naif@uomustansiriyah.edu.iq fakt_2006@uomustansiriyah.edu.iq
Peer Reviewer Name	Assist.Prof.Dr. Hanan Auda Naif	e-mail	h.naif@uomustansiriyah.edu.iq
Scientific Committee Approval Date		Version Number	

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	15. Teaching students the basic principles of physics. 16. Preparing specialists in the field of general physics and its practical applications, which bears the responsibility of studying the country's need for development and progress and capable of meeting the needs of the job market in state institutions and industry sectors. 17. Preparing an educated generation armed with science and adopts it as a sound basis to bring about radical changes and assign scientific knowledge and scientific methods in thinking, analysis and adaptation with the development of technologies, to keep up with the expansion of human needs. 18. Effective contribution for deepening and documenting the connection of the university with the society through the implementation of advisory counseling, training and development of teaching and administrative staff. 19. The service of preparing graduates specialized in physics who contribute to development in the country. 20. Meeting the needs of various sectors with highly qualified personals in the field of physics. 21. Encouraging the distinguished in this field to work as teaching assistants in the department to be part of the academic teaching staff in the future.
Module Learning Outcomes	C. Cognitive goals 5. To enable the student to know and understand the basics of physics. 6. To make students able to understand physical phenomena from a mathematical point of view. 7. Making the student able to know and understand the basics of physics through the use of modern software and keeping pace with scientific development. 8. Enable students to obtain knowledge, understand the scientific laws of physics and its practical applications, logical and scientific analysis, and the interpretation of physical phenomena. D. The skills goals special to the program 5. Sound scientific research skills and constructive scientific discussions and expressing of opinions. 6. Usage and development skills. 7. Thinking skills and enabling the student to understand and solve scientific problems related to the laws of physics. 8. Skills and ability to apply the theoretical and practical scientific experience, gained from his studies, in the areas of practical life; taking into account industrial and commercial constraints.
Indicative Contents	The course aims to teach the student one of the most important basics of physics (atomic physics), which includes a lot of basics that must be seen and known by a student specializing

	in physics and making him able to understand these basics and logical and scientific analysis in the interpretation of physical phenomena, as well as enabling the student to solve issues related to vocabulary matter using the laws of atomic physics.
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Learning and Teaching Strategies

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

Structured SWL (h/sem)		Structured SWL (h/w)	
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
Total SWL (h/sem)	750		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #6, #7
	Assignments	2	10% (10)	6 and 13	LO #3, #4 and #6, #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #12
	Midterm Exam	2hr	10% (10)	7	LO #1 - #7

Summative assessment	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Relativity theory, special theory, general theory, Einstein postulates, the Michelson Morely experiment
Week 2	Galilean transformation, Lorentz transformation
Week 3	Time dilation and length contraction
Week 4	Lorentz velocity transformation
Week 5	Exercises regarding Lorentz transformation
Week 6	Exam 1
Week 7	Relativistic momentum & relativistic energy
Week 8	Total energy and rest energy
Week 9	Equivalence of mass and energy , relationship of energy and momentum , Massless particles
Week 10	Exam 2
Week 11	Discovery of the x-ray and the electron, Determination of electron charge, x-ray production
Week 12	Blackbody radiation
Week 13	Photoelectric effect, experimental results of photoelectric effect, classical interpretation, quantum interpretation
Week 14	Compton effect, pair production and annihilation
Week 15	Exam 3
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Determine the specific charge of electron by Thomson's experiment
Week 2	Cathode ray experiments in a vacuum
Week 3	Calculate the constant of grating using cadmium source
Week 4	Discussion
Week 5	Exam
Week 6	Study the continuous spectra of the x-rays and find the minimum wavelength
Week 7	Determine Blank constant using photoelectric effect
Week 8	Study the Compton effect
Week 9	Discussion
Week 10	Oral exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1- M. Russell Wehr and James A. Richards	Available
Recommended Texts	"The physics of the atom"	No but it is available as PDF
Required Texts	2- Richard T. Wridner and Robert L. Sells	No but it is available as PDF
Websites		

Grading Scheme

Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Modern Physics</u>	Module Delivery	
Module Type	<u>Core</u>	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	UGx11 1	Semester of Delivery	1
Administering Department	Physics dDepartmet	College	College of Science
Module Leader	Assist.Prof.Dr. Hanan Auda Naif Lecturer Dr. Fatin Hameed	e-mail	h.naif@uomustansiriyah.edu.iq fakt_2006@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Assist.Prof. Dr. Hanan Auda Naif Lecturer Dr. Fatin Hameed	e-mail	h.naif@uomustansiriyah.edu.iq fakt_2006@uomustansiriyah.edu.iq
Peer Reviewer Name	Assist.Prof.Dr. Hanan Auda Naif	e-mail	h.naif@uomustansiriyah.edu.iq
Scientific Committee Approval Date		Version Number	

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	Teaching students the basic principles of physics. Preparing specialists in the field of general physics and its practical applications, which bears the responsibility of studying the country's need for development and progress and capable of meeting the needs of the job market in state institutions and industry sectors Preparing an educated generation armed with science and adopts it as a sound basis to bring about radical changes and assign scientific knowledge and scientific methods in thinking, analysis and adaptation with the development of technologies, to keep up with the expansion of human needs. Effective contribution for deepening and documenting the connection of the university with the society through the implementation of advisory counseling, training and development of teaching and administrative staff. The service of preparing graduates specialized in physics who contribute to development in the country. Meeting the needs of various sectors with highly qualified personals in the field of physics. Encouraging the distinguished in this field to work as teaching assistants in the department to be part of the academic teaching staff in the future.
Module Learning Outcomes	E. Cognitive goals 9. To enable the student to know and understand the basics of physics. 10. To make students able to understand physical phenomena from a mathematical point of view. 11. Making the student able to know and understand the basics of physics through the use of modern software and keeping pace with scientific development. 12. Enable students to obtain knowledge, understand the scientific laws of physics and its practical applications, logical and scientific analysis, and the interpretation of physical phenomena. F. The skills goals special to the program 9. Sound scientific research skills and constructive scientific discussions and expressing of opinions. 10. Usage and development skills. 11. Thinking skills and enabling the student to understand and solve scientific problems related to the laws of physics. 12. Skills and ability to apply the theoretical and practical scientific experience, gained from his studies, in the areas of practical life; taking into account industrial and commercial constraints.
Indicative Contents	The course aims to teach the student one of the most important basics of physics (atomic physics), which includes a lot of basics that must be seen and known by a student specializing in physics and making him able to understand these basics and logical and scientific analysis in

	the interpretation of physical phenomena, as well as enabling the student to solve issues related to vocabulary matter using the laws of atomic physics.
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Learning and Teaching Strategies

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

Structured SWL (h/sem)		Structured SWL (h/w)	
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
Total SWL (h/sem)	750		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #6, #7
	Assignments	2	10% (10)	6 and 13	LO #3, #4 and #6, #7, #8

	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #12
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Relativity theory, special theory, general theory, Einstein postulates, the Michelson Morely experiment
Week 2	Galilean transformation, Lorentz transformation
Week 3	Time dilation and length contraction
Week 4	Lorentz velocity transformation
Week 5	Exercises regarding Lorentz transformation
Week 6	Exam 1
Week 7	Relativistic momentum & relativistic energy
Week 8	Total energy and rest energy
Week 9	Equivalence of mass and energy , relationship of energy and momentum , Massless particles
Week 10	Exam 2
Week 11	Discovery of the x-ray and the electron, Determination of electron charge, x-ray production
Week 12	Blackbody radiation
Week 13	Photoelectric effect, experimental results of photoelectric effect, classical interpretation, quantum interpretation
Week 14	Compton effect, pair production and annihilation
Week 15	Exam 3
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Determine the specific charge of electron by Thomson's experiment
Week 2	Cathode ray experiments in a vacuum
Week 3	Calculate the constant of grating using cadmium source
Week 4	Discussion
Week 5	Exam
Week 6	Study the continuous spectra of the x-rays and find the minimum wavelength
Week 7	Determine Blank constant using photoelectric effect
Week 8	Study the Compton effect

Week 9	Discussion
Week 10	Oral exam

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	1- M. Russell Wehr and James A. Richards	Available
Recommended Texts	"The physics of the atom"	No but it is available as PDF
Required Texts	2- Richard T. Wridner and Robert L. Sells	No but it is available as PDF
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	The Crimes of the Baath Regime in Iraq	Module Delivery	
Module Type	Basic	☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MU02		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2UGx11	Semester of Delivery	2
Administering Department	05	College	01
Module Leader	Ahmed Akeel Abd	e-mail	ahmed.akeel@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	No available	e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Enlightening these generations through an intellectual and documentary approach that reveals to them the crimes of this Baathist regime against the Iraqi people. This curriculum includes cognitive keys placed in the hands of the university student, with which he can overcome the promoters of the Baathist lies and its fake media
Module Learning Outcomes	1 -Informing university students about the crimes committed by the oppressive regime in Iraq in particular and their impact on the wider region and the world. 2 -Providing documentation, photos, and dates of the brutality of this regime so that this generation can verify all of these crimes against all who followed the path of righteousness, patriotism, and rejected the criminal Ba'athist approach.

Indicative Contents	Teaching university students how to confront fake media based on historical facts about the dictatorial rule that Iraq went through, and thus confronting any attempt to incite Baathist .thought or glorify it among young people
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Learning and Teaching Strategies	
Strategies	The main strategy that will be adopted in presenting this course will be based on: discussion, .questioning, lecture, worksheets, and allowing students to ask questions

Student Workload (SWL)			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1
Total SWL (h/sem)	50		

Module Evaluation					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	)10% (10	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	)10% (10	4 and 9	LO #1, #2 and #7, #8
	Projects / Lab.	1	)10% (10	10	LO #5, #6 and #9
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO #1 - #7
	Final Exam	3hr	)0% (505	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
Week	Material Covered
Week 1	The Concept of Crimes and Their Classifications
Week 2	Types of Crimes
Week 3	Court Decisions

Week 4	Psychological Crimes
Week 5	Mechanisms of Psychological Crimes
Week 6	Effects of Psychological Crimes
Week 7	Militarization of Society
Week 8	Midterm Exam
Week 9	The Ba'ath Regime's Stance on Religion
Week 10	Images of Human Rights Violations
Week 11	Prison and Detention Centers of the Ba'ath Regime
Week 12	Destruction of Cities and Villages: The Scorched Earth Policy
Week 13	Genocide Graves Events Committed by the Regime
Week 14	Mass Graves Crimes
Week 15	Genocide Graves Relating to the Aforementioned Events
Week 16	Preparatory Week Before the Final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	The Ba'ath Party's Crimes in Iraq / Ministry of Higher Education	yes
Recommended Texts	References and Websites	yes
Websites		

Grading Scheme

Group	Grade		Marks %	Definition
Success Group (50 - 100)	A – Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Thermodynamic</u>	Module Delivery	
Module Type	<u>Core</u>	☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	UGx11 1	Semester of Delivery	1
Administering Department	Physics Department	College	College of Science
Module Leader	Lecturer Dr. Zainab I. Al-Assadi	e-mail	dr.zainab_rhm@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Lecturer Dr.	Module Leader's Qualification	Ph.D.
Module Tutor	Lecturer Dr. Zainab I. Al-Assadi	e-mail	dr.zainab_rhm@uomustansiriyah.edu.iq
Peer Reviewer Name	Lecturer Dr. Zainab I. Al-Assadi	e-mail	dr.zainab_rhm@uomustansiriyah.edu.iq
Scientific Committee Approval Date		Version Number	

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	Teaching students the basic principles of physics. Preparing specialists in the field of general physics and its practical applications, which bears the responsibility of studying the country's need for development and progress and capable of meeting the needs of the job market in state institutions and industry sectors. Preparing an educated generation armed with science and adopts it as a sound basis to bring about radical changes and assign scientific knowledge and scientific methods in thinking, analysis and adaptation with the development of technologies, to keep up with the expansion of human needs. Effective contribution for deepening and documenting the connection of the university with the society through the implementation of advisory counseling, training and development of teaching and administrative staff. The service of preparing graduates specialized in physics who contribute to development in the country. Meeting the needs of various sectors with highly qualified personals in the field of physics. Encouraging the distinguished in this field to work as teaching assistants in the department to be part of the academic teaching staff in the future.
Module Learning Outcomes	G. Cognitive goals 13. To enable the student to know and understand the basics of physics. 14. To make students able to understand physical phenomena from a thermodynamically and mathematical point of view. 15. Making the student able to know and understand the basics of physics and keeping pace with scientific development. 16. Enable students to obtain knowledge, understand the scientific laws of physics and its practical applications, logical and scientific analysis, and the interpretation of physical phenomena. H. The skills goals special to the program 13. Sound scientific research skills and constructive scientific discussions and expressing of opinions. 14. Usage and development skills. 15. Thinking skills and enabling the student to understand and solve scientific problems related to the laws of physics. 16. Skills and ability to apply the theoretical and practical scientific experience, gained from his studies, in the areas of practical life; taking into account industrial and commercial constraints.
Indicative Contents	The course aims to teach the student one of the most important basics of physics (Thermodynamics), which includes a lot of basics that must be seen and known by a student specializing in physics and making him able to understand these basics and logical and

	scientific analysis in the interpretation of physical phenomena, as well as enabling the student to solve issues related to vocabulary matter using the laws of thermodynamics.
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Learning and Teaching Strategies

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

Structured SWL (h/sem)		Structured SWL (h/w)	
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
Total SWL (h/sem)	750		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #6, #7
	Assignments	2	10% (10)	6 and 13	LO #3, #4 and #6, #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #12
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Second law of thermodynamic and its applications.
Week 2	Carnot cycle, Heat engine (Carnot engine), Refrigerator Carnot (heat pump).
Week 3	Entropy.
Week 4	Maxwell equations.
Week 5	Exam 1
Week 6	Classical and quantum assembly.
Week 7	Classical statistic (Maxwell Boltzmann Distribution).
Week 8	Bose Einstein Distribution.
Week 9	Fermi Dirac Distribution.
Week 10	Exam 2
Week 11	Stirling's formula
Week 12	Partition function
Week 13	Application of Maxwell Boltzmann Distribution
Week 14	Application of Bose Einstein and Fermi Dirac Distribution.
Week 15	Exam 3
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

Week	Material Covered
Week 1	Determination of the viscosity of water by flow through a capillary tube.
Week 2	Determining the heating Power of an ohmic load in an AC circuit as a function of the applied voltage.
Week 3	Converting electrical energy into heat Measuring with a voltmeter and an ammeter.
Week 4	Determining the specific heat of solids.
Week 5	Exam
Week 6	Determining the efficiency of a solar collector.
Week 7	Investigation the function of the expansion valve of the heat pump.
Week 8	Recording the Vapour – pressure curve of water – pressures up to 50 bar.
Week 9	Discussion
Week 10	Oral exam

Learning and Teaching Resources

	Text	Available in the Library?
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Required Texts	1-“Thermodynamic: Fundamentals for applications” , John O’Connell, j.m. Haile .	No but it is available as PDF
Recommended Texts	“Lecture notes on thermodynamics and statistical mechanics”, Julien Dvirendt.	No but it is available as PDF
Required Texts	2- “An introduction to statistical physics for students”, A.J. Pointon.	Available
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>English Language2</u>	Module Delivery	
Module Type	<u>Core</u>	☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>2</u>		
SWL (hr/sem)	<u>50</u>		
Module Level	<u>2</u>	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	/
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Master
Module Tutor	Name (Nawal Hamdan Mahmoud)	e-mail	E-mail
Peer Reviewer Name	/	e-mail	E-mail
Scientific Committee Approval Date		Version Number	

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. To use English effectively for study purpose across the curriculum. 2. To enhance the students' language skills especially in the areas of grammar (i.e. apply the rules of English grammar). 3. To enable the learner to communicate effectively and appropriately in real life situation. 4. To develop the ability to read English with understanding. 5. To develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking.

	6. To develop students ability to use English in day-to-day life and real life situation.
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Students will heighten their awareness of correct usage of English grammar in writing and speaking. 2. Students will improve their speaking ability in English both in terms of fluency and comprehensibility. 3. Students will strengthen their ability to write academic papers, essays, and formal letters. 4. The student is able to master the Mechanics of writing (for example: the use of correct punctuation marks and where to use capital and small letters). 5. Student will produce a short article or formal letter using the given template. 6. Ability to be comfortable with English in use while reading or listening.
Indicative Contents	

Learning and Teaching Strategies

Strategies	The main strategy that will be adopted in delivering this module is to encourage students to participate in the exercises, while at the same time refining and expanding their writing skills. This will be achieved through classes, interactive tutorials, and by considering writing activities involving writing essays, formal letters or emails.
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Student Workload (SWL)

Structured SWL (h/sem)		Structured SWL (h/w)	
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	
Total SWL (h/sem)	200		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2			
	Assignments	2			
	Projects / Lab.	1			
	Report	1			
Summative assessment	Midterm Exam	2hr			
	Final Exam	3hr			

Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Tenses – Present Simple Tense & The Present Continuous Tense
Week 2	Question Forms (Yes / no Question) & (Information Question)
Week 3	Tenses – Tenses – Past Simple Tense / Regular & Irregular Verbs Future Intentions [The use of Will & (be + going to)]
Week 4	Quantity (much, many, some, any, a few, a little, a lot of, and lots of)
Week 5	Verb Pattern ¹ – Gerund & Verb Pattern ² – Infinitive
Week 6	Comparative and Superlatives Adjectives
Week 7	Tenses – Present Perfect & Past Simple Tense & Articles (the , a, an)
Week 8	The Differences between have & have got
Week 9	Time and Conditional Clauses
Week 10	How to Write a Formal Letter or Email
Week 11	Passives
Week 12	Reported statements
Week 13	Reading Students’ activities
Week 14	Reading Students’ activities
Week 15	Reading Students’ activities
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1. New Headway Plus (Pre-Intermediate) – By : John and Liz Soars (Oxford University Press)	Yes
Recommended Texts	2. Headway Academic Skills / Level 1 : By; Sarah Philpot and Lesley Curnick (Series Editors: Liz and John Soars) (Oxford)	Yes

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Analytical mechanics</u>	Module Delivery	
Module Type	<u>Basic</u>	☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code			
ECTS Credits	<u>4</u>		
SWL (hr/sem)	<u>100</u>		
Module Level	UGx11 2		
Administering Department	Department of physics	College	College of sience
Module Leader	Assist.Prof.Dr. Sahar Issa Saeed Assist.Prof.Dr. Waleed Salah	e-mail	dr.sahar.phy@uomustansiriyah.edu.iq dr.waleedsalah@uomustansiriyah.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Assist.Prof.Dr. Sahar Issa Saeed Assist.Prof.Dr. Waleed Salah	e-mail	dr.sahar.phy@uomustansiriyah.edu.iq dr.waleedsalah@uomustansiriyah.edu.iq
Peer Reviewer Name	Assist.Prof.Dr. Sahar Issa Saeed	e-mail	dr.sahar.phy@uomustansiriyah.edu.iq
Scientific Committee Approval Date	2024/2025	Version Number	

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	Analytic mechanics play an important role in study the motion of rigid bodies , this subject aims to complete study of the classical mechanical laws in order to develop the student abilities to understand the function of various mechanical systems
Module Learning Outcomes	Course Intended Outcomes: On the completion of this subject , the student is expected to be able to : 1- Derive and explain the conservations laws of momentum and energy , and use them in different applications . 2- Derive the laws of rotation motion and apply them to the motion of planets and satellite . 3- Describe the action of centripetal forces. 4- Calculate the components of the moment of inertia for different shapes . 5- Describe Lagrange's and Hamiltonian's principles. 6- Understand Lagrange's and Hamiltonian's equation and use them in different application . 7- Use relative formulas to define force, momentum, and energy..
Indicative Contents	Indicative content includes the following. <u>4-</u> Describing the principles and law theoretically <u>5-</u> Deriving the equations mathematically. <u>6-</u> Solving example problems to show how equation can be applied.

Learning and Teaching Strategies

Strategies	The lectures are divided in to six chapters .The subject starts to complete the study of Fundamental Concept. Vectors. And Newtonian Mechanics.Rectilinear motion of a particle .And the harmonic Oscillator. And the study of Kepler's laws as an application to the universal of gravitation . The subject also describes Lagrange's and Hamiltonian's equation and their application and links between classical mechanical and the special theory of relativity
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Student Workload (SWL)

Structured SWL (h/sem)	100	Structured SWL (h/w)	4
Unstructured SWL (h/sem)		Unstructured SWL (h/w)	1
Total SWL (h/sem)	100		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10%(10)	5 and10	
	Homework1	2	10%(10)	2 and11	

	Homework2	2	10%(10)	3 and 12	
	Report	1	10%(10)	13	
Summative assessment	First Exam	2hr	10% (10)	14	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	General motion of a particle in Three Dimension, Conservative Forces and Force Fields
Week 2	Gradient and the Del Operator in Mechanics .Examples.
Week 3	Motion of a projectile in a Uniform Gravitational ,No Air Resistance ,Linear Air Resistance
Week 4	The Harmonic oscillator in Two-Dimensional Isotropic Oscillator. The Three- Dimensional Isotropic Oscillator ,Non Isotropic Oscillator.
Week 5	Motion of Charged Particles in Electric and Magnetic Fields Solve problems and home works.
Week 6	The first examination
Week 7	Central Forces and Celestial Mechanics, Gravity ,Gravitational Potential, Angular Momentum in Central Fields ,The law of keplers law of planetary motion
Week 8	Orbit of a particle in a central-force field .Examples .
Week 9	Energy Equation of the orbit . Orbit in an inverse-square field
Week 10	Orbital energies in the inverse-square field.
Week 11	Angular momentum and kinetic energy of system.
Week 12	The Second examination
Week 13	Lagrangian Mechanics ,Generalized Coordinates, Lagrange's Equations.
Week 14	Some applications of Lagrange's equations .The Hamiltonian Function. Hamilton's equations. Solve problems .
Week 15	Home works and Preparatory week before the final Exam
Week 16	The final Exam

Learning and Teaching Resource

	Text	Available in the Library?
Required Texts	1-"Analytical Mechanics ",G.R.Fowels,2013. 2-"Classical Dynamics" by J.B. Marion,2010	available
Recommended Texts	1-Analytical Mechanics. Louis N. Hand ,Janet D.Finch, Cambridge University Press. 2- Classical Mechanics, H. Goldstein, Charles P.Poole, John L.Safko, Pearson Higher Education .	available
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
	F – Fail		(0-44)	Considerable amount of work required
Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

Module Information			
Module Title	<u>Heat and Thermodynamic</u>		Module Delivery
Module Type	<u>Core</u>		☒ Theory ☒ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code			
ECTS Credits	<u>6</u>		
SWL (hr/sem)	<u>150</u>		
Module Level	UGx11 1	Semester of Delivery	1
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2024	Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	This course deals with the fundamentals of Thermodynamics including thermodynamic systems and properties, relationships among the thermos-physical properties, the laws of thermodynamics and applications of these basic

	laws in thermodynamic systems. This course will provide the essential tools required to study thermodynamic systems in Applied Thermodynamics.
Module Learning Outcomes	After successful completion of this course the students will be able to: 1. Explain fundamental concepts relevant to thermodynamics. 2. Explain the concepts of work, power, and heat in thermodynamics; determine work and heat sign conventions; determine work involved with moving boundary systems (graphical and analytical methods). 3. Explain the first law of thermodynamics for a closed system. 4. Perform energy analysis of refrigeration and heat pump thermodynamic cycles. 5. Determine thermodynamic properties of pure substances. 6. Apply the first law of thermodynamics for a control volume, including with turbines, compressors, nozzles, diffusers, heat exchangers, and throttling devices. 7. Explain the second law of thermodynamics, including why it is necessary, how it is defined (Kelvin-Planck and Clausius), the nature of irreversibility, and the Carnot cycle. 8. Explain the concept of entropy, including the Clausius Inequality, using thermodynamic tables, setting up entropy balances, and calculating isentropic efficiency of pumps, compressors, turbines, and heat exchangers.
Indicative Contents	Indicative content includes the following: Thermodynamic: Zeroth law of thermodynamics, heat, work, , first law of thermodynamics, entropy, enthalpy, internal energy, heat capacities, second law of thermodynamics, real and ideal gases, third law of thermodynamics.

Learning and Teaching Strategies

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

Structured SWL (h/sem)	63	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	12	Unstructured SWL (h/w)	1
Total SWL (h/sem)	75		

Module Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #6, #7
	Assignments	2	10% (10)	6 and 13	LO #3, #4 and #6, #7, #8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1- #12
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

Week	Material Covered
Week 1	Basic Concepts of Thermodynamics Definition of Thermodynamics, Thermodynamic Systems, Macroscopic and Microscopic Points of View, Thermodynamic Equilibrium, Properties of Systems, State, Process, Cycle, Point Function, Path Function, Temperature, Zeroth Law of Thermodynamics.
Week 2	Thermometer The Thermometer and Thermometric Property, Pressure, Specific Volume, Reversible and Irreversible Processes, Energy, Work and Heat, Reversible Work.
Week 3	Properties of Pure Substances Definition of the Pure Substance, Phase Change of a Pure Substance, p-T (Pressure-temperature) Diagram for a Pure Substance, P-V-T (Pressure-Volume-Temperature) Surface, Phase Change Terminology and Definitions, Property Diagrams in Common Use, Formation of Steam, Important Terms Relating to Steam Formation.
Week 4	First Law of Thermodynamics Internal Energy, Law of Conservation of Energy, First Law of Thermodynamics, Application of First Law to a Process, Energy—A Property of System.
Week 5	First Law of Thermodynamics Application of First Law of Thermodynamics to Closed System.
Week 6	First Law of Thermodynamics Application of First Law to Steady Flow Process
Week 7	Mid-term Exam
Week 8	Second Law of Thermodynamics Limitations of First Law of Thermodynamics and Introduction to Second Law, Performance of Heat Engines and Reversed Heat Engines, Reversible Processes,

Week 9	Second Law of Thermodynamics Statements of Second Law of Thermodynamics: Clausius statement Kelvin-Planck statement Equivalence of Clausius statement to the Kelvin-Planck statement
Week 10	Third Law of Thermodynamics and Entropy Entropy—a property of a system, Change of entropy in a reversible process, Entropy and Irreversibility, Change in Entropy of the Universe, Temperature Entropy Diagram Characteristics of Entropy.
Week 11	Third Law of Thermodynamics and Entropy Entropy Changes for a Closed System: General case for change of entropy of a gas, Heating a gas at constant volume, Heating a gas at constant pressure, Isothermal process, Adiabatic process (reversible), Polytropic process, Approximation for heat absorbed. Entropy Changes for an Open System The Third Law of Thermodynamics
Week 12	Ideal and Real Gases Introduction, The Equation of State for a Perfect Gas, p-V-T Surface of an Ideal Gas Internal Energy and Enthalpy of a Perfect Gas, Specific Heat Capacities of an Ideal Gas.
Week 13	Ideal and Real Gases Real Gases, Van der Waal's Equation, Virial Equation of State.
Week 14	Thermodynamic Relations General Aspects, Fundamentals of Partial Differentiation, Some General Thermodynamic Relations, Entropy Equations (TdS Equations), Equations for Internal Energy and Enthalpy.
Week 15	Thermodynamic Relations Measurable Quantities: Equation of state Coefficient of expansion and compressibility Specific heats Joule-Thomson coefficient
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
Week	Material Covered
Week 1	Lab 1: Measuring the Linear Expansion of Solids as a Function of Temperature.
Week 2	Lab 2: Resistance Grading and its Use for Temperature Measurement.
Week 3	Lab 3: Determining the Latent Heat of Fusion of Ice.
Week 4	Lab 4: Stefan Boltzmann's Law Investigation.
Week 5	Lab 5: Dependence of Temperature on the Volume of a Gas at Constant Pressure.
Week 6	Lab 6: Electro-thermal Grading and its use as a Thermometer.
Week 7	Lab 7: The Work of the Thermal Machine.

Week 8	Lab 8: Determining the Relationship Between Water Temperature and Vapor Pressure.
Week 9	Lab 9: Mixing Water at Different Temperatures.

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Cengel, Y.A., Boles M.A., Canoglu M., Thermodynamics. An engineering approach, 9th ed. New York, McGraw-Hill Education, 2019.	No but it is available as PDF
Recommended Texts	Moran M.J., Shapiro H.N.: Fundamentals of engineering thermodynamics, 5th ed. John Wiley & Sons, 2006.	No but it is available as PDF
Required Texts	Szargut J.: Technical thermodynamics (Termodynamika techniczna, in Polish). Wydawnictwo Politechniki Śląskiej, Gliwice, 2005.	No but it is available as PDF
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
Success Group (50 - 100)	A - Excellent		90 - 100	Outstanding Performance
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Fail Group (0 – 49)	FX – Fail		(45-49)	More work required but credit awarded
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MODULE DESCRIPTION FORM

Module Information

Module Title	<u>Arabic Language</u>	Module Delivery	
Module Type	<u>Basic</u>	☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	<u>MU06</u>		
ECTS Credits	<u>2</u>		
SWL (hr/sem)	<u>50</u>		
Module Level	UGx11	Semester of Delivery	1
Administering Department	07	College	01
Module Leader	Dr. Maisam Adnan Abdul Resool	e-mail	maysam_adnan74@uostansiriyah.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	No available	e-mail	E-mail
Peer Reviewer Name	Entiha Abbas Aliwi	e-mail	Enteaaabbas@uomustansiriyah.edu.iq
Scientific Committee Approval Date		Version Number	1.0

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	Introducing the student to the fact that the Arabic language is one of the most important foundations upon which the student confirms his identity, and through which his personality is built if he deals with it well, in addition to the sanctity of the Arabic language and its being an eternal language due to its connection to the Holy Quran, through: defining the basics of the language and its impact on expressing meaning, using correct movements and controlling the form to convey the most accurate meanings. Learning the methods of speech and the art of .speaking and addressing
Module Learning Outcomes	Keeping pace with the modern era, in terms of absorbing language skills that include writing, reading, speaking, and listening, allowing the student to participate in discussions, activities, .seminars, direct observation, and self-learning

Indicative Contents	Refine the vocabulary commonly used by students and try to avoid incorrect, vulgar, and foreign words that offend the language and public taste. In addition, embody Islamic and .human values in practical examples and selected literary texts

Learning and Teaching Strategies	
Strategies	Presenting the scientific material, its applications and discussing it, then .conducting the qualifying tests

Student Workload (SWL)			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1
Total SWL (h/sem)	50		

Module Evaluation					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4 and 11	LO #1, #2 and #9, #10
	Assignments	2	10% (10)	5 and 10	LO #3, #4 and #7
	On site assignments	2	10% (10)	9, 14	LO #5, #8 and #11,#13
	Report	1	10% (10)	15	LO #6, #12 and #14
Summative assessment	Midterm Exam	1hr	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
Week	Material Covered
Week 1	The Scientific Miracle in the Language of the Holy Quran / The Digital Miracle in Surat Al-Kahf as a Model
Week 2	Diagrammatical and Punctuation Marks (Harakat) and Their Importance in the Arabic Language
Week 3	The Simple Verb and the Augmented Verb and the Meanings of Augmented Letters
Week 4	Types of Sentences in Arabic: The Nominal Sentence
Week 5	The Verbal and Conditional Sentence
Week 6	Prose Art: Proverbs and Their Embodiment of Meaning
Week 7	Prose Art: The Story and Its Educational Effects

Week 8	Monthly Exam
Week 9	(ة, ت) Rules for Writing the Tā' Marbuta and Tā' Mabsūta
Week 10	Modern and Contemporary Poetry: Traditional and Free Verse, the Differences Between Them and Their Characteristics
Week 11	Al-Rusafi's Poem "The Orphan on Eid" (Memorization and Analysis)
Week 12	Hafez Ibrahim's Poem (Arabic Language) (Memorization and Analysis)
Week 13	Badr Shakir al-Sayyab's Free Verse Poem "Weapons and Children" (Memorization and Analysis)
Week 14	Linguistic Corrections
Week 15	The Soft Alif: Rules for Writing It in Letters, Nouns, and Verbs
Week 16	Discussion of the Scientific Report

Learning and Teaching Resources		
	Text	Available in the Library?
Required Texts	Arabic Language for Non-Majors, Essential Foundations, Asst. Prof. Dr. Taghreed Fadel Abbas, Asst. Dr. Jabbar Eidan Razan, and others, Al-Dhad Library for Publishing and Distribution. First Edition, Publication Year 2018	yes
Recommended Texts	The Delight of Students and the Masterpiece of Readers and Writers / Written by Muhammad bin Ali al-Bablawi al-Maliki (d. 1306 AH) Dar Ibn al-Jawzi, Egypt - Cairo, 1st ed., 2013 AD	yes
Websites		

Grading Scheme				
Group	Grade		Marks %	Definition
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Comparison between the vision and objectives of the Physics Department and the learning outcomes of the courses

The vision of the Physics Department at the College of Science, Al-Mustansiriyah University, represents a clear direction toward consolidating academic excellence and striving to develop students' skills and expertise in line with labor market requirements. The department's **mission** focuses on preparing distinguished students, both academically and practically, in various fields of physics, while adhering to academic quality standards to qualify graduates capable of competing locally and regionally. The **objectives** of the academic program revolve around graduating scientifically and skillfully qualified personnel, promoting scientific research, and building a generation of graduates with advanced degrees in various physics specializations.

When reviewing the **learning outcomes**, objectives, and guiding content of the courses, we find a clear alignment between the department's orientations and the content of these courses. For example, the Mechanics course in the first year aims to enable students to understand the laws of motion and their various applications, enhancing their analytical and logical abilities. This aligns with the department's vision of scientifically preparing students. The Electricity course also introduces in-depth concepts related to electrical forces, fields, and circuits, and focuses on the applied aspect of problem solving, supporting the department's mission of providing practical and effective education. The Properties of Materials course focuses on the study of the mechanical properties of materials and their behavior under various conditions, providing students with an applied understanding related to industry and modern technologies. This approach aligns with the department's goal of preparing graduates with practical experience.

These courses demonstrate a commitment to covering three main areas of learning outcomes: knowledge, represented by a theoretical understanding of basic concepts; skills that include analysis, critical thinking, and teamwork; and values that aim to instill discipline, a commitment to professionalism, and scientific research.

Despite this consensus, some areas of improvement can be identified. Some courses do not provide detailed learning objectives directly linked to the academic program objectives, making it advisable to clarify the relationship between each learning outcome and the program's performance indicators. Furthermore, the practical content in some courses requires further clarification regarding laboratory activities and their connection to actual labor market skills. Values and attitudes appear in general terms in some courses, and it would be preferable to strengthen this aspect and link it more closely to professionalism and academic ethics.

In general, these courses reflect a strong alignment with the department's vision, mission, and goals, and constitute a sound foundation for preparing students academically and professionally to meet the needs of society and the labor market.