Academic Program Description Form

University Name: Tikrit University

Faculty/Institute: College of Education -Tuz khurmatu

Scientific Department: Department of Physics

Academic or Professional Program Name: Bachelor's degree

Final Certificate Name: Bachelor of Physics

Academic System: Annual

Description Preparation Date: 2026 / 2 / 22

File Completion Date Date: 2026 / 2 / 23

Signature:

Head of Department Name:

Lec. Dr. **Hassan Jalal Akber**

Date: 2026 / 2 / 24

Signature:

Scientific Associate Name:

Assis. Lec. Ali Salah ZaynlAbdein

Date: 2026 / 2 / 24

The file is checked by:

Department of Quality Assurance and University Performance

Name of the Director of the Quality Assurance and University Performance Department:

Lec. Dr. Samar Nashat Ali

Date: 2026 / 2 / 24

Signature:

Signature:

Approval of the Dean :

Prof. Dr. Nihad Ali Shafeek

1. Program Vision

The vision of the Department of Physics is to prepare an aware generation capable of keeping pace with scientific developments in all areas of life in general and physics in particular. Since its establishment, this department has worked to graduate educational and teaching staff with a high level of efficiency and practical experience.

2. Program Mission

The mission of the Physics Department is educational and scientific, working to raise scientific generations capable of keeping pace with scientific developments in various cultural fields. Its highest mission is to provide the competent professor who keeps pace with his reality and keeps pace with it with a spirit keen on knowledge and learning.

3. Program Objectives

- Preparing highly skilled male and female teachers.
- Preparing a generation of distinguished researchers in physics.
- Serving the community by providing physics information.
- Developing faculty members scientifically and culturally.
- Explaining the great importance of physics and its role in society.

4. Program Accreditation

Nothing

5. Other external influences

Many holidays in the school year

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	16	9.5%	
College Requirements	9	34	20.1 %	
Department Requirements	21	119	70.4 %	
Summer Training				
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First	MEP011	Mechanics	**3**	**2**
	THP041	Heat and Propertise of the Material	2	-
	ELP021	Electricity and Magnetism I	3	2
	MAP011	Mathematics I	3	-
	ح016	Computer I	1	-
	ع ن ت 017	Developmental and Educational Psychology	2	-
	اص ت016	Fundamentals of Edcation	1	-
	لغعرب017	Arabic Language	1	-
	ح ق013	Democracy and Human Rights	1	-
	لغنك017	English Language	1	-
Second	WMP042	Sound and Wave Motion	2	-
	م ك م018	Currculums and School Books	2	-
	SSP052	Astronomy	2	-
	لغنك017	English Language	1	-
	ELP032	Electricity and Magnetism II	2	2

	MAP022	Mathematics II	3	–
	015ا ت	Secondary education and educational Administration	2	–
	015 ت	Teaching Thinking	2	–
	OPP012	Optics	3	2
	016ح	Computer II	1	–
	017ج	Crimes of the baath regime in Iraq	1	–
	017لغعرب	Arabic Language	1	–
Third	ATP023	Atomic and molecular Physics	3	2
	THP033	Thermodynamic	3	–
	ELP013	Electronics	3	2
	AMP043	Analytical Mechanics	3	–
	د م	Complex Functions	2	–
	019ا ص ن	Psychological Guidance and Psychological heath	2	–
	018 ط ت	Curriculum and methods of teaching	2	–
	EP 053	Optional	2	–
Fourth	NUP014	Nuclear Physics	3	2
	LAP044	Laser	2	–
	EMR46	Electromagnetic theory	3	–
	QUP034	Quantum mechanics	3	–
	SOP024	Solid state physics	3	–
	018ق ت	Measurment and evaluation	2	–
	019م ت	Practical education	1	2
	–	Research Project	2	–
	–	Demonstration instruments Lab	–	2

8. Expected learning outcomes of the program

Knowledge

A- The student is able to understand the various branches of physics.

B- Preparing physics teachers at levels that keep pace with the development taking place.

C- The student understands the individual differences between students.

D- The student understands the correct foundations of scientific research.

Skills

A- The student acquires the skills of describing physics.

B- The student acquires the skills of working in laboratories.

C- The student is able to work on qualifying himself to become a successful educational and scientific leader.

D- The student learns the correct foundations to become a successful physics teacher.

Ethics

A- Loves his assigned work.

B- Loves knowledge.

C- Adopts the dialogue method between the student and the teacher.

D- Ability to work in a multidisciplinary team.

9. Teaching and Learning Strategies

- Classroom education through scientific lectures.
- Preparing reports and research.
- Practical learning in scientific laboratories

10. Evaluation methods

- Processing method using final grades.
- Random and surprise tests.
- Monthly theoretical tests and practical reports on the curriculum taught.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof. Dr.	Physics	Superconductivity			↗	
Assis. Prof	Physics	Nuclear Physics			↗	
Assis. Prof.	Chemical Engineering	Chemical Engineering			↗	
Lec. Dr.	Physics	Solid State Physics			↗	
Lec. Dr.	Physics	Solid State Physics			↗	
Lec. Dr.	Curricula and teaching methods	Curricula and Methods of Teaching Arabic Language			↗	
Assis. Lec.	English language Linguistics	Semantics			↗	
Assis. Lec.	Physics	Plasma Physics			↗	
Assis. Lec.	Physics	Solid State Physics			↗	
Assis. Lec.	Management and economics	Business Administration			↗	
Assis. Lec.	Management and economics	International Economics			↗	
Assis. Lec.	Physics	Atomic Physics			↗	
Assis. Lec.	Physics	Material Physics			↗	
Lec. Dr.	Geography	Human Geography			↗	
Lec. Dr.	Educational and	General Curricula and			↗	

	Psychological Sciences	Teaching Methods				
Assis. Lec.	Islamic Sciences	Islamic Sciences			↗	
Assis. Lec.	Geography	Human Geography			↗	
Assis. Lec.	Teaching Methods Curricula	Methods of Teaching Arabic			↗	
Assis. Lec.	Physical Education	Physical Education			↗	
Assis. Lec.	Business Administration	Business Administration			↗	

Professional Development

Mentoring new faculty members

The head of the department directs new faculty members to adhere to working hours and lecture times and urges them to develop their academic abilities in order to provide the correct delivery to the student.

Professional development of faculty members

The head of the department develops a plan for faculty members that includes classroom and extracurricular activities for students in order to improve the level of the educational process. He also urges them to adhere to lecture times, record absences, and pay attention to all exams.

12. Acceptance Criterion

(**Central admission**

13. The most important sources of information about the program

- Books prescribed by the Ministry of Higher Education and Scientific Research.
- External scientific confiscations.
- Use of central libraries and the Internet.

14. Program Development Plan

Striving to make the physics specialization have a tangible practical application, through applying physical concepts, phenomena and principles to reality and contemporary society, in addition to courses and seminars that give the teaching staff the ability to keep pace with similar programs in countries around the world in order to obtain accreditation through developing curricula and thus developing the academic program and working on it in the correct manner.

Program Skills Outline

				Required program Learning outcomes											
Year/ Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First	MEP011	Mechanics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	THP041	Heat and Propertise of the Material	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ELP021	Electricity and Magnetism I	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	MAP011	Mathematics I	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ح016	Computer I	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ع ن ت 017	Developmental and Educational Psychology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	اص ت 016	Fundamentals of Edcation	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	لغعرب 017	Arabic Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ح ق013	Democracy and Human Rights	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	لغنك017	English Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
Second	WMP042	Sound and Wave Motion	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ع ن017	Developmental Psychology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SSP052	Astronomy	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	لغنك017	English Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ELP032	Electricity and Magnetism II	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	MAP022	Mathematics II	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ت ا015	Secondary education and educational Administration	Basic	*	*	*	*	*	*	*	*	*	*	*	*

	015 من ب	Fundamentals of scientific research	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	OPP012	Optics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	016ح	Computer II	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	017ج	Crimes of the baath regime in Iraq	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	لغعرب 017	Arabic Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
Third	ATP023	Atomic and molecular Physics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	THP033	Thermodynamic	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ELP013	Electronics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	AMP043	Analytical Mechanics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	د م	Complex Functions	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ا ص ن 019	Psychological Guidance and Psychological heath	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	018 ط ت	Curriculum and methods of teaching	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	EP 053	Optional	optional	*	*	*	*	*	*	*	*	*	*	*	*
Fourth	NUP014	Nuclear Physics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	LAP044	Laser	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	EMR46	Electromagnetic theory	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	QUP034	Quantum mechanics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SOP024	Solid state physics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	018ق ت	Measurment and evaluation	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	019م ت	Practical education	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	–	Research Project	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	–	Demonstration instruments Lab	Basic	*	*	*	*	*	*	*	*	*	*	*	*

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

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	SSP052	Astronomy	2	-
	لغنك017	English Language	1	-
	ELP032	Electricity and Magnetism II	2	2

	MAP022	Mathematics II	3	–
	015ا ت	Secondary education and educational Administration	2	–
	015 ت	Teaching Thinking	2	–
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	–	Research Project	2	–
	–	Demonstration instruments Lab	–	2

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Knowledge

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Lec. Dr.	Physics	Solid State Physics			↗	
Lec. Dr.	Curricula and teaching methods	Curricula and Methods of Teaching Arabic Language			↗	
Assis. Lec.	English language Linguistics	Semantics			↗	
Assis. Lec.	Physics	Plasma Physics			↗	
Assis. Lec.	Physics	Solid State Physics			↗	
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Assis. Lec.	Physics	Material Physics			↗	
Lec. Dr.	Geography	Human Geography			↗	
Lec. Dr.	Educational and	General Curricula and			↗	

	Psychological Sciences	Teaching Methods				
Assis. Lec.	Islamic Sciences	Islamic Sciences			↗	
Assis. Lec.	Geography	Human Geography			↗	
Assis. Lec.	Teaching Methods Curricula	Methods of Teaching Arabic			↗	
Assis. Lec.	Physical Education	Physical Education			↗	
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First	MEP011	Mechanics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	THP041	Heat and Propertise of the Material	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ELP021	Electricity and Magnetism I	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	MAP011	Mathematics I	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ح016	Computer I	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ع ن ت 017	Developmental and Educational Psychology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	اص ت 016	Fundamentals of Edcation	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	لغعرب 017	Arabic Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ح ق013	Democracy and Human Rights	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	لغنك017	English Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
Second	WMP042	Sound and Wave Motion	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ع ن017	Developmental Psychology	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SSP052	Astronomy	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	لغنك017	English Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ELP032	Electricity and Magnetism II	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	MAP022	Mathematics II	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ت ا015	Secondary education and educational Administration	Basic	*	*	*	*	*	*	*	*	*	*	*	*

	015 من ب	Fundamentals of scientific research	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	OPP012	Optics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	016ح	Computer II	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	017ج	Crimes of the baath regime in Iraq	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	لغعرب 017	Arabic Language	Basic	*	*	*	*	*	*	*	*	*	*	*	*
Third	ATP023	Atomic and molecular Physics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	THP033	Thermodynamic	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ELP013	Electronics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	AMP043	Analytical Mechanics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	د م	Complex Functions	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	ا ص ن 019	Psychological Guidance and Psychological heath	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	018 ط ت	Curriculum and methods of teaching	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	EP 053	Optional	optional	*	*	*	*	*	*	*	*	*	*	*	*
Fourth	NUP014	Nuclear Physics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	LAP044	Laser	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	EMR46	Electromagnetic theory	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	QUP034	Quantum mechanics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	SOP024	Solid state physics	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	018ق ت	Measurment and evaluation	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	019م ت	Practical education	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	–	Research Project	Basic	*	*	*	*	*	*	*	*	*	*	*	*
	–	Demonstration instruments Lab	Basic	*	*	*	*	*	*	*	*	*	*	*	*

- **Please tick the boxes corresponding to the individual program learning outcomes under evaluation.**

Course Description Form

1. Course Name:
English Language
2. Course Code:
3. Semester / Year:
Year
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Presence
6. Number of Credit Hours (Total) / Number of Units (Total)
3o Hours/ 2 units each hour.
7. Course administrator's name (mention all, if more than one name)
Name: Maali Sattar Namuq Email: maaly.a.namuq@tu.edu.iq
8. Course Objectives

Course Objectives	The aim of this course is to introduce the student to the importance of the scientific subject –Describe all aspects of language teaching, including reading, writing, listening, and speaking –Empowering the student to rely on himself in applying the scientific material in his academic life.

9. Teaching and Learning Strategies	
Strategy	1- Lecture method and use of the interactive whiteboard 2-Explanation and clarification 3- Providing students with the basics and additional topics Related to thinking outcomes. 4- Asking the students questions and forming discussion groups during lectures to discuss the solution to the questions posed to them 5- Giving homework to students.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
30 weeks	Each hour weekly		1-How to do exercises 2-About 3-Time:telling the time 4-Same and difference 5-How old are you? Family history. 6-Physical actions 7-Parts of body 8-Talk about character 9-first exam 10-Emotion 11-12-13 Review and solving exercises 14-Accessoties with Clothes 14-15-Indirect questic 16- Review and solvin exercises 17-Describing routine 18- Review and solvin	Presence Diction Direct And the means Illustratio With Electronic Program (Class -room)	Oral Questions Daily exams Homework Monthly Exams Final exam

			exercises 19-Adverbs 20-Agreeing and disagree 21-22- Review and solving exercises 23-second exam 24-Writing e-mail 25-Talking about the Weather 26- Time expressions 27-present tense 28-past tense 29-futer tense 30- Review and solving exercises		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc
Asking questions about topics that can be discussed by students in class and asking questions that the student can solve.
Classes have daily exams and intellectual questions.
Preparing external questions from supporting sources and following up on the method of class discussions.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	New Headway: beginner first year students English Language
Main references (sources)	English Grammar in Use
Recommended books and references (scientific journals, reports…)	Any book that deals with the basics of the English language

Electronic References, Websites	

Course Description Form

1. Course Name: Mechanics
2. Course Code: MEP011
3. Semester / Year: Annual
4. Description Preparation Date: 2025-2026
5. Available Attendance Forms: weekly\ Conducting in-person experiments in the laboratory according to the schedule of the Physics Department
6. Number of Credit Hours (Total) / Number of Units (Total) 60 hours 3 units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Essam Samin Ali Assistant lecturer, Wasfi kanan.
8. Course Objectives

Course Objectives	• **Providing the student with knowle of practical experimental equipm and how to use it** • **2- Identify the physical principle each experiment** • **3- To learn about the applications physics and how to treat them** • **4- Identify errors and how to addr them** • **5- Providing the student w knowledge of how to calculate grou acceleration…..** • …..

9. Teaching and Learning Strategies	
Strategy	Conduct experiments practically -Building mental capabilities to link theoretical and practical aspects

	-Emphasizing feedback - Asking questions of a motivational nature for research a scientific competition

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	- Providing t student w knowledge of t laboratory a explaining how prepare repo and understa experiments	Get to know t experiences the first semes in general	Lectures are presented in PDF format (standard method.discussion)	Class performar and Daily and monthly exams
2	2	Providing the student with knowledge of graphing, setting points on the require coordinates, and finding th slope	Mapping poi on a graph a calculating t slope	Lectures are presented in PDF format (standard method.discussion)	Class performar and Daily
3		Providing the student with knowledge of the simple pendulum	The pendulu experiment	Lectures are presented in PDF format (standard method.discussion)	Class performar and Daily
4	2	Providing the student with knowledge of Hooke's law	Hooke's experiment	Lectures are presented in PDF format (standard method.discussion)	Class performar and Daily
5	2	Providing the student with	Boyle's experiment	Lectures are presented	

		knowledge of Boyle's Law		in PDF format (standard method.discussion	
6	2	Providing the student with knowledge of how find the Earth's acceleration using simple pendulum	Experience find the Ear acceleration	Lectures are presented in PDF format (standard method.discussion	
7	2	Providing the student with knowledge of determining the hardness factor o metal leg using th static method	An experiment t determines hardness factor o metal leg using static method	Lectures are presented in PDF format (standard method.discussion	
8	2	Providing student with knowledge o laboratory equipment	A comprehens review of experiences of first semester	Lectures are presented in PDF format (standard method.discussion	
9	2	Providing student with knowledge o laboratory equipment	practical exam		
10	2	Providing student with knowledge o laboratory equipment	practical exam	Lectures are presented in PDF format (standard method.discussion	
11	2	Providing the student with knowledge of the experiences of the second semester	Learn about experiences of second semester		
12		Providing the student with knowledge of common errors a ways to avoid the	Review and alert errors	Lectures are presented in PDF format (standard method.discussion	
13	2	Providing the student with knowledge of how find acceleration	Experiment to f the grou acceleration using ball rolling on concave surface		
14	2	Providing the student with the knowledge to calculate the	Experiment on coefficient longitudinal expansion of a cop	Lectures are presented in PDF format	

		coefficient of longitudinal expansion of a copper stem	stem	(standard method.discussion	
15	2	Providing the student with knowledge of how determine the frequency of a tuning fork using standing waves	Determine frequency of a tun fork using stand waves	Lectures are presented in PDF format (standard method.discussion	
16		Providing the student with knowledge of how determine the coefficient of stati friction between t horizontal/slante surfaces	Experiment determine coefficient of st friction between t horizontal/slanted surfaces	Lectures are presented in PDF format (standard method.discussion	
17	2	Providing the student with knowledge of determining the Young's modulus a metal wire	Experiment determine Young's modulus metal wire	Lectures are presented in PDF format (standard method.discussion	
18	2	Providing student with knowledge o laboratory equipment and laboratory experiments	Review experiences of second semester	Lectures are presented in PDF format (standard method.discussion	
19	2	Providing student with knowledge o laboratory equipment and laboratory experiments	practical exam	Lectures are presented in PDF format (standard method.discussion	

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if a	Practical physics
Main references (sources)	Fundamentals of Physics, F. Bush, 197
Recommended books and references (scientific journals, reports…)	Scientific books and scientific journ specialized in mechanical percussion
Electronic References, Websites	Farid sites in physics

Course Description Form

1. Course Name: Mechanic
2. Course Code:
3. Semester / Year:2026−2025
4. Description Preparation Date:
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name: Reham Zaid Hadi Email: reham.z.hadi @tu.edu.iq
8. Course Objectives

Course Objectives	**Teaching students the concepts of motion, velocity and projectiles in mechanics** **Using the laws of motion and velocity in solving problems** **Training students in laboratory on some pract experiments.**

9. Teaching and Learning Strategies

Strategy	Teaching and motivating first-year students to use the concepts of mechanics in describing natural phenomena in their correct form and how to apply them in real life.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Vectors and Units	Vectors and Units		
2	3	, Properties of Vectors,	Vector Properties		
3	3	Negative of a vector	Vector Negation Vector Addition		
4	3	Addition of a vector	Vector Subtraction		
5	3	Subtraction of a vector			
6	3	Equality of a vector	Vector Equality Vector Product		
7	3	Directional	Directional Trinomial		
8	3	product	Dot Product		
9	3	Directional, triple	Dotted Trinomial		
10	3	Dot product	Displacement and Distance		
11	3	Dot, triple	Time and Acceleration		
12	3	Displacement and distance	Motion of		
13	3	Time and acceleration,	Uniform Objects In a Straight Line		
14	3	Motion of uniform bodies	Free Fall		
15	3	In a straight line	Projectile Motion		
16	3	Free fall	Newton's Laws		
17	3	Motion projectiles,	Momentum		
18	3	Newton's Laws	Inertia,		
19	3	Momentum	Power and Energy,		
20	3	Inertia,	Kinetic Energy,		
21	3	Power and Energy,	Potential Energy.		
22	3	Kinetic Energy, Potential Energy.	Mass and Weight		
23	3	Mass and Weight	Friction		
24	3	Friction	Types of Friction		
25	3	Types of Friction	Central Force		
		Central Force	Law of Universal		

26	3	Law of Universal Gravitation	Gravitation		
27	3	Conservative Forces	Conservative Forces		
28	3	Non-Conservative Forces	Non-Conservative Forces		
29	3	Kepler's Lav	Kepler's Law		
30	3				

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Unique site in physics.

Reham Zaid Hadi

Course Description Form

1. Course Title: Developmental and Educational Psychology
2. Course Code : HNT 017
3. Semester / Year: Annual
4. Date of preparation of this description at the beginning of the academic year ٢٠٢٥ - ٢٠٢٦
5. Available Attendance Forms: Physical
6. Number of credit hours (total) / number of units (total): 60 hours, number of units: 2
7. Course administrator name (if more than one name is mentioned) /
Name: M.m Najah M. Werdee Email: najah.m.werdee@tu.edu.iq
8. Course Objectives
This course aims to provide the student with the basic concepts of developmental psychology, the study of the stages of human growth from the beginning of pregnancy until the end of childhood, and shed light on the physical, mental, linguistic, emotional and social characteristics of development for each stage, and the developmental theories that explain them.
9. Teaching and Learning Strategies

	- Brainstorming , dialogue, discussion and some classroom activities.

	- Use educational discussion (educational dialogue), which depends on the exchange of ideas to reach the facts. - The collective memorandum to involve all students in the classroom activity. –

10. Course Structure

Evaluation method	Learning method	Unit or subject name	Required Learning Outcomes	Hours	The week
Oral and written test	Dialogue, discussion and brainstorming	**Course Description + Developmental Psychology Concept and Demands**	**Course Description + Developmental Psychology Concept and Demands**	2	1
Oral and written test	Dialogue, discussion and brainstorming	**Factors affecting growth (genetic + environmental + glands)**	**Factors affecting growth (genetic + environmental + glands)**	2	2
Oral and written test	Dialogue, discussion and brainstorming	**Growth theories**	**Growth theories**	2	3
Oral and written test	Dialogue, discussion and brainstorming	**Division of developmental and embryonic stages**	**Division of developmental and embryonic stages**	2	4
Oral and written test	Dialogue, discussion and	**Lactation stage**	**Lactation stage**	2	5

	brainstorming				
Oral and written test	Dialogue, discussion and brainstorming	**Early childhood 3-6 years**	**Early childhood 3-6 years**	2	6
Oral and written test	Dialogue, discussion and brainstorming	**Middle Childhood 6-9 Years**	**Middle Childhood 6-9 Years**	2	7
Oral and written test	Dialogue, discussion and brainstorming	**Late childhood 9-12 years**	**Late childhood 9-12 years**	2	8
Oral and written test	Dialogue, discussion and brainstorming	**Childhood problems**	**Childhood problems**	2	9
Oral and written test	Dialogue, discussion and brainstorming	**Adolescence Early adolescence**	**Adolescence Early adolescence**	2	10
Oral and written test	Dialogue, discussion and brainstorming	**Late adolescence**	**Late adolescence**	2	11
Oral and written test	Dialogue, discussion and brainstorming	**Teenagers' needs and problems**	**Teenagers' needs and problems**	2	12

Oral and written test	Dialogue, discussion and brainstorming	**Review**	**Review**	2	13
Oral and written test	Dialogue, discussion and brainstorming	**The historical development of educational psychology**	**The historical development of educational psychology**	2	14
Oral and written test	Dialogue, discussion and brainstorming	Definition, nature and subject of educational psychology	Definition, nature and subject of educational psychology	2	15
Oral and written test	Dialogue, discussion and brainstorming	Psychology Schools	Psychology Schools	2	16
Oral and written test	Dialogue, discussion and brainstorming	Applied direction	Applied direction	2	17
Oral and written test	Dialogue, discussion and brainstorming	Educational objectives: classification and transformation into educational goals	Educational objectives: classification and transformation into educational goals	2	18
Oral and written test	Dialogue, discussion and brainstorming	Steps to write the goal	Steps to write the goal	2	19

Oral and written test	Dialogue, discussion and brainstorming	Learning and its conditions	Learning and its conditions	2	20
Oral and written test	Dialogue, discussion and brainstorming	Behavior and factors affecting it	Behavior and factors affecting it	2	21
Oral and written test	Dialogue, discussion and brainstorming	Factors affecting the effectiveness of the educational process (science and education)	Factors affecting the effectiveness of the educational process (science and education)	2	22
Oral and written test	Dialogue, discussion and brainstorming	Attention	Attention	2	23
Oral and written test	Dialogue, discussion and brainstorming	Motivation in learning	Motivation in learning	2	24
Oral and written test	Dialogue, discussion and brainstorming	Remember	Remember	2	25
Oral and written test	Dialogue, discussion and brainstorming	Objective factors that help to remember	Objective factors that help to remember	2	26

Oral and written test	Dialogue, discussion and brainstorming	Theories of interpretation of remembrance	Theories of interpretation of remembrance	2	27
Oral and written test	Dialogue, discussion and brainstorming	Forgetting	Forgetting	2	28
Oral and written test	Dialogue, discussion and brainstorming	Transmission of the learning effect	Transmission of the learning effect	2	29
Oral and written test	Dialogue, discussion and brainstorming	Review	Review	2	30

11. Course Evaluation

- Theoretical exams
- Questions out of the box
- Oral tests

12. Learning and Teaching Resources

Al-Alusi, Jamal Hussein: 1983	Required textbooks (methodology, if any)
developmental Psychology, Book No. 121 Author Dr. Mariam Selim, Year of printing 20 Number of pages 560	Main references (sources)

Course Description Form

1.Course Name:

Heat and material properties

2.Course Code:

THP014

3.Semester / Year:

2025/2026

4.Description Preparation Date:

2026/2/17

5.Available Attendance Forms:

In-person lectures according to the official schedule of the Physics Department / Fourth Stage, as well as exams, according to the instructions within the department in the college.

6.Number of Credit Hours (Total) / Number of Units (Total)

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7.Course administrator's name (mention all, if more than one name)

Name: : Robak Aziz Rasheed
Email: Rupak.A.Rasheed@tu.edu.iq

8. Course Objectives

Course Objectives

Students learn about the topic of heat and the properties of matter and its role in understanding the principles of physics and in daily life.

How to use this knowledge in facing daily life situations in the field of education, family and society.

Makes students of the faculties of education for pure sciences feel the value and importance of physics and the role of heat in the history of physics and how to deal with school students after graduation and practice their specialties as teachers in schools.

And middle and secondary schools and some research laboratories in government departments in the field of research and development.

9. Teaching and Learning Strategies

1. Identify the material of heat and the properties of matter, and how it originated, crystallized and became a human need for engineering and technological applications, as well as identify its methods, fields and theories.
2. Identify the laws, their standards and conditions, the crises they go through, and their benefits to society.
3. Identify the types of temperature scales.
4. Identify the mechanical properties of materials.
5. Identify the magnetic and electrical properties of materials.
6. Identify the fourth state of matter.
7. Provide the student with knowledge of heat and the properties of matter, as the student can convert this knowledge into behavior and action when the situation requires a specific response to solve a problem.
8. Provide the student with knowledge of heat and the factors that determine it, and it can convert this knowledge into behavior that contributes to removing the factors that determine it, and enjoys personal compatibility and harmony with the environment in which he lives.

10. Course Structure

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

		Outcomes			
١+٢+٣+٤	٨=٤×٢	Gaining knowledge in the field of heat physics and its role in building human civilization in general. Identifying the types of thermometers and the mechanics of heat transfer.	Temperature measurement Types of thermometers Thermal expansion Methods of heat transfer	Theoretical	Tests and Questions
٥+٦+٧+٨	٨=٤×٢	Gain knowledge in the field of energy sources and the first law of thermodynamics.	- Energy sources Thermal - Specific heat - First law of thermodynamics	Theoretical	Tests and Questions
٩+١٠+١١ +١٢	٨=٤×٢	Gain knowledge in distinguishing between ideal gas and real gas.	- Real gas and ideal gas - Kinetic theory of gases - Relationship between Cv and Cp	Theoretical	Tests and Questions
١٣+١٤ ١٥+١٦	٨=٤×٢	Gain knowledge in the field of density as well as viscosity.	Density and specific gravity - Bernoulli's equation - Surface tension - Viscosity	Theoretical	Tests and Questions
١٧+١٨ ١٩+٢٠	٨=٤×٢	Gain knowledge of the mechanical properties of materials.	-Young's coefficient -Types of stress and strain -The relationship between mechanical properties and temperature	Theoretical	Tests and Questions
٢١+٢٢ ٢٣+٢٤	٨=٤×٢	Gain knowledge in the field of magnetic properties of materials.	Study of the magnetic properties of materials	Theoretical	Tests and Questions
٢٥× ٢٦	٤=٢×٢	Gain knowledge in the field of electrical properties of	- Classification of materials Electrical conductivity - Conductors	Theoretical	Tests and Questions

		materials.	Insulators and semiconductors		
٢٧ × ٢٨	٤=٢×٢	Gaining knowledge in the field of the fourth state of matter, which is plasma.	Knowing the difference between the states of matter Plasma forms The importance of studying plasma	Theoretical	Tests and Questions
٢٩+٣٠	٤=٢×٢	Gain knowledge in the field of composite materials, reinforcements and base materials.	- Classification of materials - Types of composite materials - Advantages and disadvantages of composite materials	Theoretical	Tests and Questions

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	١- Heat and properties of Materials ,by Kadem Ahmed mohemed . 2- The Science and Engineering of Materials, Donald R. Askeland – Pradeep P. Phulé . 3-Classification of materials JosepPoch March.
Main references (sources)	Heat and Thermodynamics , Mark W Zymansky
Recommended books and references (scientific journals, reports...)	Heat and Properties of Matter Lectures Bo PDF Physics Website - com The largest library in physics
Electronic References, Websites	-1 Heat and properties of matter, the unique site in physics. -2 Properties of matter and heat, the Al N Library website. -3 Heat and properties of matter, the uni electronic library.

Robak Aziz Rasheed

Course Description Form

1. Course Name: Electric
Electric and Magnetism I – Practical
2. Course Code:
ELP021
3. Semester / Year:
Annual
4. Description Preparation Date:
2025–2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 1 unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Zainab Sameen Ali **Email**: zainabsali@tu.edu.iq
8. Course Objectives
The general objective of this course is to enable students to understand the fundamental laws of electrical circuits, acquire practical skills in performing experiments, become familiar with electrical devices—especially measuring instruments—master circuit connections, and effectively utilize the obtained results.
9. Teaching and Learning Strategies

Strategy	Lecture method, laboratory dialogue, discussion, and giving examples.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
3-1	6	The purpose of using the color code on resistors is to quickly determine their resistance in ohms and the tolerance.	Calculating electrical resistance using the color code	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
6-4	6	Ohm's law describes the relationship between voltage,	Ohm's Law	Theoretical lecture with data show	Daily exams in addition to monthly exams

		current, and resistance		explanation in the lab	
9-7	6	hen resistors are connected in series, the total resistance equals the sum of the individual resistances, and the same current flows through all of them.	Connecting resistors in series	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
12-10	6	When resistors are connected in parallel, the voltage across each resistor is the same, the total resistance is calculated as the reciprocal of the sum of the reciprocals of the individual resistances, and the current is divided among them.	Connecting resistors in parallel	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
15-13	6	Discharging a charged capacitor means allowing current to flow through an external circuit until it gradually loses its charge, with its voltage decreasing over time until it reaches zero	Discharging a charged capacitor	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
18-16	6	The outputs of a Wheatstone bridge are the voltage difference between the two middle points; it is zero when the bridge is balanced and non-zero when it is unbalanced.	Wheatstone Bridge	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
21-19	6	The maximum power of a generator is achieved when the	Maximum power of the generator	Theoretical lecture with data show	Daily exams in addition to monthly exams

		load resistance equals the internal resistance of the generator, at which point the greatest possible energy is delivered to the load.		explanation in the lab	
24-22	6	Kirchhoff's law states that the sum of currents entering any node equals the sum of currents leaving it, and the sum of voltage drops around any closed loop equals zero.	Kirchhoff's Law	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
27-25	6	The results of the Stefan–Boltzmann law experiment in radiation show that the radiative power of a blackbody is directly proportional to the fourth power of its absolute temperature; that is, as the temperature increases, the emitted radiation increases significantly.	Stefan's Law of Radiation	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
30-28	6	The results of the internal resistance experiment of a cell show that the cell voltage decreases as the current increases, and its internal resistance can be calculated from the relationship between voltage and current.	Internal resistance of the electric cell	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
11. Course Evaluation					

Distributing the score out of 15 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Electricity and Magnetism. Dr. Yahya Abdel Hamid
Main references (sources)	Electricity by sears
Recommended books and references (scientific journals, reports…)	Electrical magnetism by halliday and Resnick
Electronic References, Websites	Electronic educational sites And the educational physics network

Course Description Form

1. Course Name:

2. Course Code: 1 Rating: 110FL

3. Semester / Year:yearly

4. Description Preparation Date: 10/10/2024

5. Available Attendance Forms: Basic attendance

6. Number of Credit Hours (Total) / Number of Units (Total)60 hour

7. Course administrator's name (mention all, if more than one name)

Name: Ayoob Ali Jaafar
Email: ayoob.a.jaafar@tu.edu.iq

8. Course Objectives

General Objectives •Increase the student's understanding of the educational and social reality throughout the ages •Realize the educational process in its most essential necessities •Understand educational theories of various peoples, ancient and modern A-Cognitive Objectives A1- The student should possess the knowledge and information that help achieve adaptation and compatibility as well as psychological adaptation to solve life and daily problems	**B – Program specific skill objectives** **B1– Developing the student's skill towards increasing the research skill and scientific achievement** **B2– Developing the student's skill towards increasing the effectiveness of scientific achievement** **B3–– Developing the student's skill towards increasing interaction with others** **B4–– Developing the student's skill towards increasing understanding of the foundations and principles of general education in the past and present** **C– Emotional and value objectives.** **C1– The student adheres to professional ethics.** **C2– The student possesses literary and human thinking skills.**

A2- The student should learn about the meaning of the foundations of education, its goals and theories A3- Understand the basic principles of the foundations of education and enable the student to apply them in life A4- The student should learn about the historical educational foundation and understand the main ideas put forward by scholars and thinkers A5- Provide the student with sufficient information and knowledge to enable him to analyze and evaluate them A6- The student should learn about the meaning of intellectual development and how to achieve scientific gains	**C3- The student possesses critical thinking skills.** **C4- The student possesses decision-making skills.** **C5- The student listens well to the lesson topic** **C6- The student responds to questions related to the fields of education and its foundations** **C7- The student accepts the subject of education and its foundations** **C8- The student compares between the fields of education in societies** **C9- The student evaluates the fields of education its foundations**

9. Teaching and Learning Strategies

Strategy	Brainstorming, dialogue, discussion and some classroom activities. - Using educational discussion (educational dialogue) which depends on exchanging ideas to reach the facts. - Group memo to involve all students in the classroom activity

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Meaning and goals of education Meaning and goals of education	e meaning and als of education functions, characteristics	Dialogue, discussion and brainstorming	Oral written test
2		Its functions, characteristics Its functions, characteristics	storical basis of education e economic asis of education		

3		Historical basis of education	tional and cial foundations		
		Historical basis of education	tional and cial foundations		
4		Historical development through the ages, primitive education, Historical basis of education	tional and cial foundations		
5		Education in Mesopotamia and Chinese education Historical basis of education			
6		Greek education Historical basis of education Dialogue.			
7		Pre-Islamic Arab education Historical basis of education			
8		Education after Islam, its			

		goals, curricula, centers, institutions, characteristics The historical basis of education			
9		Leaders of Arab Islamic thought (Al-Ghazali, Ibn Khaldun and Ibn Sina) The historical basis of education			
10		The educational role of the family The social basis of education			
11		The educational role of society The social basis of education			
12		Equal educational opportunities The social basis of education			

13		Media and education The social basis of education			
14		Education and its impact on National Development The Economic Basis of Education			
15		Education and its Impact on Human Resources Development The Economic Basis of Education			
16		Economic Factors in Education The Economic Basis of Education			
17		Education and Research Methodology The Scientific Basis of Education			
18		Education and Scientific and Technological Progress			

		The Scientific Basis of Education			
19		National and Social Foundations National and Social Foundations			
20		Modern Education Modern Education			
21		Features and objectives Modern education			
22		Functions of contemporary education Modern education			
23		Modern thought figures (Pestalozzi) Modern education			
24		Rousseau and John Dewey Modern education ,			

25		That the individual has a specific social need. Educational Administration			
26		The Concept of Educational Administration Educational Administration			
27		Management Styles Educational Administration			
28		Duties of the School Principal and Characteristics of a Successful Principal Educational Administration			
29		Factors Influencing Administration Educational Administration			
30		Parent-Teacher Councils (Objectives and Role) Educational Administration			

11.
Theoretical exams • Out of the box questions. Oral tests
12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	methodical book
Main references (sources)	

Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: Arabic Language / First Year

2. Course Code: LughArab 017

3. Semester / Academic Year: Annual

4. Date of Preparation: Beginning of the Academic Year 2025–2026

5. Available Attendance Mode: In-person (On-campus)

6. Total Teaching Hours / Credits: 30 Teaching Hours
Credits: 1

. Course Instructo ١.

Name: Assist. Lect. Ibrahim Youssef Ibrahim

Email ibrahim.youssef@tu.edu.iq

8. Course Objectives

This course aims to:

1. Provide students with new knowledge in Arabic language studies.
2. Enable students to understand and apply Arabic grammar (Nahw).
3. Enable students to acquire knowledge and understanding of morphology (Sarf) and Arabic literature.
4. Develop students' skills in spelling (orthography) and written expression.
5. Enhance students' ability to identify and correct common linguistic errors.

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	. Teaching and Learning Strategies • Brainstorming. • Classroom discussion and dialogue. • Cooperative learning (group note-taking). • Interactive lectures. Analytical classroom activities

بنية المقرر

Week	Hours	Required Learning Outcomes	Unit/Topic	Teaching Method	Assessment Method
1	1	Understanding selected Qur'anic texts	The Holy Qur'an	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
2	1	Understanding selected Hadith texts	Prophetic Hadith	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
3	1	Study of classical poetry	Antarah ibn Shaddad	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
4	1	Understanding morphological	Morphological Scale	Paper-based lectures and	Direct questions / Weekly & monthly

Week	Hours	Required Learning Outcomes	Unit/Topic	Teaching Method	Assessment Method
		patterns		board explanation	quizzes
5	1	Recognizing plural forms in Arabic	Plurals in Arabic	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
6	1	Monthly Exam	Monthly Exam	Paper-based test	Paper-based test
7	1	Soundness and weak letters	Sound and Weak Verbs	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
8	1	Mastery of Arabic letters	Arabic Alphabet	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
9	1	Proper punctuation usage	Rules of Punctuation	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
10	1	Correct hamza writing	Rules of Writing Hamza	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
11	1	Understanding selected Qur'anic texts	The Holy Qur'an	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
12	1	Understanding selected Hadith texts	Prophetic Hadith	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
13	1	Introduction to Arabic literature	Arabic Literature	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
14	1	Monthly Exam	Monthly Exam	Paper-based test	Direct questions / Monthly quiz
15	1	Identifying parts of speech	Parts of Speech	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes

Week	Hours	Required Learning Outcomes	Unit/Topic	Teaching Method	Assessment Method
16	1	Distinguishing declinable and indeclinable words	Declension and Indeclinability	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
17	1	Nominal sentence structure	Subject and Predicate	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
18	1	Study of abrogative particles	Abrogatives (Nawasikh)	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
19	1	Understanding sentence agents	Subject and نائب الفاعل (Deputy Subject)	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
20	1	Introduction to rhetoric	Introduction to Rhetoric	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
21	1	Monthly Exam	Monthly Exam	Paper-based test	Direct questions / Monthly quiz
22	1	Introduction to Arabic rhetoric	Arabic Rhetoric	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
23	1	علم البيان	Science of Bayan	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
24	1	Types of simile	Simile	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
25	1	Arabic letters review	Arabic Alphabet	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
26	1	Punctuation rules	Punctuation Rules	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes

Week	Hours	Required Learning Outcomes	Unit/Topic	Teaching Method	Assessment Method
27	1	Hamza writing rules	Writing Hamza	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
28	1	Rules of writing Alif	Writing Alif	Paper-based lectures and board explanation	Direct questions / Weekly & monthly quizzes
29	1	Monthly Exam	Monthly Exam	Paper-based test	Direct questions / Monthly quiz
30	—	Final comprehensive exam	Final Exam	Paper-based exam	Comprehensive assessment

٣. 11. Course Evaluation
• Written theoretical exams • Critical thinking questions (out-of-the-box questions • Oral examinations

12. Teaching and Learning Resources	
Required Textbooks (Curricular, if any)	cial textbooks approved by the Ministry of Higher Education
Main References (Sources)	None

Course Description Form

1. Course Name:
Computer
2. Course Code:
H016
3. Semester / Year:
Annual
4. Description Preparation Date:
٢٠٢٥-٢٠٢٦
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours / 1 unit
7. Course administrator's name (mention all, if more than one name)
Name: kamaran Adil Ibrahim **Email: kamaran zm@tu.edu.iq**

8. Course Objectives	
Course Objectives	* Preparing and qualifying specialists to meet the requirements of the labor market in its public and private sectors by diversifying teaching and learning methods and training students to apply acquired knowledge and skills to solve real-world problems. * Creating an appropriate climate for students to enable them to apply their acquired knowledge and skills in identifying the needs and problems of society and social matters related to computers and information technology. * Providing distinguished academic programs in the field of computers, both theoretical and practical, that are consistent with international standards of academic quality and

	meet the needs of the labor market. *** Encouraging and developing scientific research in the fields of computers in general** **and in the areas of office software suites (Office) in particular.** *** Developing the scientific and technical capabilities in educational laboratories and** **providing all their requirements.** *** Providing specialized laboratories for scientific research equipped with scientific** **capabilities to provide an opportunity for teaching staff to develop their abilities.** *** Working to publish scientific and qualitative articles and publications that keep pace** **with the information development wheel in the world.** *** Holding specialized scientific conferences.**

9. Teaching and Learning Strategies	
Strategy	Lecture method, laboratory dialogue, discussion, and giving examples.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Concepts of Hardware and Software with their components.	Introduction to Computers	Theoretical lecture	General questions, discussion, and monthly exams.
2	1	Concept of Computing, Data and Information; Applications of Information, Connecting input/output devices and peripherals to the CPU.	Introduction to Computers	Theoretical lecture	General questions, discussion, and monthly exams.
3	1	Computer Parts, Hardware	Computer Components	Theoretical lecture	General questions,

		Components, Input/Output Units.			discussion, and monthly exams.
4	1	Memory Types: Volatile Memory and Non-Volatile Memory, Secondary Storage.	Computer Components	Theoretical lecture	General questions, discussion, and monthly exams.
5	1	CPU Components: Control Unit (CU), Arithmetic Logic Unit (ALU) and Registers.	Computer Components	Theoretical lecture	General questions, discussion, and monthly exams.
6	1	Computer Ports, Personal Computer (Features and Types).	Computer Components	Theoretical lecture	General questions, discussion, and monthly exams.
7	1	Operating System; Basics of Common Operating Systems; The User Interface, Using Mouse Techniques.	Operating System and Graphical User Interface (GUI)	Theoretical lecture	General questions, discussion, and monthly exams.
8	1	Use of Common Icons, Status Bar, Using Menus and Menu Selection.	Operating System and Graphical User Interface (GUI)	Theoretical lecture	General questions, discussion, and monthly exams.
9	1	Concept of Folders and Directories, Opening and Closing Different Windows;	Operating System and Graphical User Interface (GUI)	Theoretical lecture	General questions, discussion, and monthly exams.

		Creating Shortcuts.			
10	1	Customization and Personalization of GUIs, Accessibility Features in GUIs, User Experience (UX).	Operating System and Graphical User Interface (GUI)	Theoretical lecture	General questions, discussion, and monthly exams.
11	1	Word Processing Basics; Basic Features of Word Processors, Opening and Closing Documents.	Word Processing	Theoretical lecture	General questions, discussion, and monthly exams.
12	1	Text Creation and Manipulation; Formatting Text and Paragraphs, Using Templates for Document Creation.	Word Processing	Theoretical lecture	General questions, discussion, and monthly exams.
13	1	Creating and Managing Tables, Utilizing Styles and Themes.	Word Processing	Theoretical lecture	General questions, discussion, and monthly exams.
14	1	Spell Check and Grammar Tools, Using Headers and Footers.	Word Processing	Theoretical lecture	General questions, discussion, and monthly exams.
15	1	Introduction to Spreadsheet Software, Creating and	Spreadsheets	Theoretical lecture	General questions, discussion,

		Formatting Worksheets.			and monthly exams.
16	1	Sorting and Filtering Data, Using Formulas and Functions.	Spreadsheets	Theoretical lecture	General questions, discussion, and monthly exams.
17	1	Using Formulas and Functions, Using Pivot Tables for Data Analysis.	Spreadsheets	Theoretical lecture	General questions, discussion, and monthly exams.
18	1	Data Validation and Error Checking, Data Visualization: Creating Charts and Graphs.	Spreadsheets	Theoretical lecture	General questions, discussion, and monthly exams.
19	1	Introduction to Presentation Software, Overview of Popular Presentation Tools, Creating a New Presentation.	Presentation Software	Theoretical lecture	General questions, discussion, and monthly exams.
20	1	Using Templates and Themes, Inserting and Formatting Text and Images, Transition and Animation Effects.	Presentation Software	Theoretical lecture	General questions, discussion, and monthly exams.
21	1	Using Speaker Notes and Timers, Advanced	Presentation Software	Theoretical lecture	General questions, discussion, and monthly exams.

		Features: Hyperlinks and Action Buttons.			
22	1	Troubleshooting Common Presentation Issues, Future Trends in Presentation Technology.	Presentation Software	Theoretical lecture	General questions, discussion, and monthly exams.
23	1	Computer Networks Basics; LAN, WAN.	Introduction to Internet and Web Browsers	Theoretical lecture	General questions, discussion, and monthly exams.
24	1	Concept of Internet and its Applications; Connecting to the Internet.	Introduction to Internet and Web Browsers	Theoretical lecture	General questions, discussion, and monthly exams.
25	1	World Wide Web; Web Browsing Software, Search Engines.	Introduction to Internet and Web Browsers	Theoretical lecture	General questions, discussion, and monthly exams.
26	1	Understanding URL; Domain Name; IP Address.	Introduction to Internet and Web Browsers	Theoretical lecture	General questions, discussion, and monthly exams.
27	1	Basics of Electronic Mail; Getting an Email Account;	[Communications and Email]	Theoretical lecture	General questions, discussion, and monthly exams.

		Sending and Receiving Emails; Accessing Sent Emails; Using Email; Document Collaboration.			
28	1	Sending and Receiving Emails; Accessing Sent Emails; Using Email; Document Collaboration.	[Communications and Email]	Theoretical lecture	General questions, discussion, and monthly exams.
29	1	Definition of Cloud Computing and its Concept, Cloud-Based Office Suites (Office 365 and Google Workspace).	[Introduction to Cloud Computing and Services]	Theoretical lecture	General questions, discussion, and monthly exams.
30	1	Google Workspace: Google Docs, Google Sheets, Google Drive, Google Meet.	[Introduction to Cloud Computing and Services]	Theoretical lecture	General questions, discussion, and monthly exams.

11. Course Evaluation

Distribution of the 25 marks according to the tasks assigned to the student, such as daily preparation, daily, monthly, and written exams, etc.

12. Learning and Teaching Resources

Recommended supporting books and referen (scientific journals, reports…):	Theses and Dissertations

Electronic references, internet sites:	Electronic Research

13. Curriculum Development Plan

- Familiarity with the latest developments in teaching and learning strategies.
- Using modern technology and scientific reports through illustrative videos to consolidate the scientific material visually.

Course Description Form

1. Course Name:
Electric and Magnetism I
2. Course Code:
ELP021
3. Semester / Year:
Annual
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hours / 6 unit- theoretical
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Zainab Sameen Ali **Email**: zainabsali@tu.edu.iq

8. Course Objectives	
Course Objectives	**1- Introducing students to the importance of scientific knowledge of the course of electromagnetism and its applications in daily life.** **2- Teaching students the basic principles of the physics of electricity and magnetism and the basic laws to explain some natural phenomena and preparing students on how to explain or interpret these phenomena and their laws.** **3- How to employ this knowledge and benefit from it in the applications available in life.** **4- Making students feel the value and importance of physics materials in general and electricity in particular and its various applications while practicing their specializations as competent teachers in schools.**

9. Teaching and Learning Strategies	
Strategy	Lecture, dialogue, discussion, and giving examples.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1-6	18	Gain knowledge in the field of understanding the meaning of static electricity and unit systems.	Chapter One: General lecture on electrostatics - Electric charges, Coulomb's law, systems of units, conductors, insulators and semiconductors.	Lecture and discussion	Class questions and written exams
7	3	-	Month exam 1	Editorial	Monthly exam
8-12	15	In knowledge gain in the field of understanding the meaning of electric fields	Chapter Two: Electric fields and their calculations. Electric lines of force. With applications, examples and problems	Lecture and discussion	Class questions and written exams
13	3	-	Month exam 2	Editorial	Monthly exam
14-18	15	In knowledge gain in the field of understanding the meaning of electric fields	Chapter Three: Gauss's law and its applications, Electric field of charged conductors. With applications, examples and problems	Lecture and discussion	Class questions and written exams
19	3	-	Month exam 3	Editorial	Monthly exam
20-24	15	Gain knowledge in the field of understanding the meaning of electric voltage	Chapter Four: Electric potential, electric potential difference, potential energy, equipotential surfaces, potential gradient, potential of a charged conductive sphere. .Examples and problems	Lecture and discussion	Class questions and written exams

25	3	-	Month exam 4	Editorial	Monthly exam
26-30	15	Gain knowledge in the field of understanding the meaning of electric current and resistance.	Chapter Five: Electric current, resistance and resistivity, Ohm's law, calculating resistance, change in resistance with temperature, measuring current and current density. Connecting electrical resistors in series and parallel	Lecture and discussion	Class questions and written exams

11. Course Evaluation

Distributing the score out of 35 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Electricity and Magnetism. Yahya Abdel Hamid
Main references (sources)	Electricity by sears
Recommended books and references (scientific journals, reports…)	Electrical magnetism by halliday and Resnick
Electronic References, Websites	Electronic educational sites And the educational phys network

13. Curriculum Development Plan

Identifying everything new and innovative in teaching and learning strategies and benefiting from the latest results of scientific research in electricity and magnetism, in addition to applying some modern teaching strategies that ensure the development of the teacher's ability by reading solid research published in high-quality, solid journals.

Course Description Form

1. Course Name:
Calculus
2. Course Code:
Map011
3. Semester / Year:
2025−2026
4. Description Preparation Date:
25−10−2024
5. Available Attendance Forms:
Classroom and Google classroom
6. Number of Credit Hours (Total) / Number of Units (Total)
(90 hour per year) / Number of Units (3 units)
7. Course administrator's name (mention all, if more than one name)
Name:M. M. Nahida Fahad Abd Email: nahida.fahad.tuz@tu.edu.iq
8. Course Objectives

Course Objectives	**Identify the concept of calculus , set and interval define the function and the types of function ,domain and range the graph of the function ,limit**

	,continuity, derivative integral, method of find the integral, area under graph ,applicaton of integral, polare coordinate.

9. Teaching and Learning Strategies

Strategy	**Brainstorming** **Feedback at lecture time** **Collaboration and feedback series**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	5		introduction to sets and interval define the function	Explanation by using the board	Quick test Homework
2	5		**Absoluate value**	=	=
3	5		Domain and range of the function	=	=

4	=		Types of function and its operation	=	=
5	=		Graph of the function		
6	=		Trigonometric functions and its inverse	=	=
7	=		Hyporbilic and the invers hyporbilic function	=	=
8	=		Limit of function	=	=
9	=		Theorem of limits	=	=
10	=		Continuous	=	=
11	=		Definition of Derivative	=	=
12	=		Derivative of Trigonometric Functions	=	=
13	=		Derivative of Inverse of Trigonometric Functions	=	=
14	=		Exponential Function	=	=
15	=		Application of Derivative	=	=
16	=		Area under curve	=	=
17	=		Indefinite integral	=	=

18	=		Theorem of Indefinite integral	=	=
19	=		definite integral	=	=
20	=		Foundations theorem of integral	=	=
21	=		Properties of definite integral	=	=
22	=		Methods of integral	=	=
23	=		Integral of exponential function	=	=
24	=		Integral of Trigonometric functions	=	=
25	=		Integral of Hyperbolic Functions	=	=
26	=		Area an volume	=	=
27	=		Polar coordinate	=	=
28	=		Types of function in polar coordinate	=	=
29	=		Graph of function in polar coordinate	=	=
30	=		Area in polar coordinate	=	=

11.Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, dailyoral, monthly, or written exams, reports .... etc (50) and (50) final

exam.

12.Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Thomas calculus
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Information
Human Rights and Democracy
2. Course Code
107
3. Semester / Year: Annual
2026−2025
4. Date of Preparation:
2025-11-20
5. Attendance Form
In-person (Mandatory)
6. Total Credit Hours / Units:
60 Hours / 2 Units
7. Course Coordinator:
Asst. Lect. Haifa Farouk Kareem Fadhil haifafarouk@tu.edu.iq
8. Course Objectives

• Preparing a conscious generation aware of human rights and public freedoms. • Developing cultural levels and increasing student awareness. • Keeping students updated with other nations' experiences in human rights. • Familiarizing students with key international conventions, treaties, and instruments. • Informing students about constitutional articles guaranteeing rights and freedoms. • Educating students on their rights, freedoms, protection methods, and limits. • Understanding the role of education in spreading the culture of democracy and good governance.	**Course objectives**

• Encouraging active participation in governance through free and fair elections. • Developing analytical and critical skills regarding the future of human rights.	

9. and Learning Strategies

• Direct lecture delivery method. • Student groups and collaborative learning. • Workshops. • Reports and research studies. • Use of illustrative aids and visual tools. • Attendance and physical presence tracking. • Role-playing strategies within the classroom. • Writing analytical papers related to human rights and democracy topics.	**Teaching**

10. Course Structure (Weekly Plan)

Assessment Method	Teaching Method	Unit/Topic Title	Learning Outcomes	Hours	Week
Q&A	Q&A	Concept of Human Rights and the International Bill of Rights	Concept & Importance	2	1
Oral Questions	Oral Questions	Human Rights Definition and National Implementation Mechanisms	Concept & Importance	2	2

Daily Quiz	Daily Quiz	Concept of the International Bill of Human Rights	Concept & Importance	2	3
Q&A	Q&A	Categorical and Special Rights	Concept & Importance	2	4
Written Exam	Written Exam	Rights of Women, Children, Minorities, and Persons with Disabilities	Concept & Importance	2	5
Q&A	Q&A	National Procedures for Implementing Special or Categorical Rights	Concept & Importance	2	6
Interrogation	Interrogation	Grave Violations of Human Rights	Concept & Importance	2	7
Discussion	Discussion	Combating Grave Violations of Human Rights	Concept & Importance	2	8
Interrogation	Interrogation	International Humanitarian Law & Human Rights in Conflict	Concept & Importance	2	9
Q&A	Q&A	Grave Violations of Human Rights in Iraq	Concept & Importance	2	10
Q&A	Q&A	Human Rights Council & Universal Periodic Review (UPR)	Concept & Importance	2	11

Oral Questions	Oral Questions	International/Regional Protection Mechanisms & Accountability	Concept & Importance	2	12
Daily Quiz	Daily Quiz	Contemporary Challenges in Human Rights	Concept & Importance	2	13
Q&A	Q&A	Challenges Facing Human Rights	Concept & Importance	2	14
Written Exam	Written Exam	National and Procedural Mechanisms to Enhance Rights	Concept & Importance	2	15
Q&A	Q&A	Democracy: Historical Origins and Evolutionary Path	Concept & Importance	2	16
Interrogation	Interrogation	Historical Concepts of Democracy's Emergence & Foundations	Concept & Importance	2	17
Discussion	Discussion	Evolution of Democracy in the Modern Era and its Correlates	Concept & Importance	2	18
Interrogation	Interrogation	Democracy in the 20th Century: Totalitarianism vs. Expansion	Concept & Importance	2	19
Q&A	Q&A	Patterns of Democracy in Contemporary Contexts	Concept & Importance	2	20

Q&A	Q&A	Islam and Democracy	Concept & Importance	2	21
Oral Questions	Oral Questions	Institutions and Mechanisms of Democracy	Concept & Importance	2	22
Daily Quiz	Daily Quiz	Separation of Powers and Democratic Governance Principles	Concept & Importance	2	23
Q&A	Q&A	Elections as a Mechanism for Democracy	Concept & Importance	2	24
Written Exam	Written Exam	Political Parties	Concept & Importance	2	25
Q&A	Q&A	Civil Society and Pressure Groups	Concept & Importance	2	26
Interrogation	Interrogation	Relations between Democracy and Public Movements	Concept & Importance	2	27
Discussion	Discussion	Guarantees of Rights and Freedoms in Democratic Systems	Concept & Importance	2	28
Interrogation	Interrogation	Media and Democracy	Concept & Importance	2	29
Q&A	Q&A	Democratic Systems and Comparative Studies	Concept & Importance	2	30

Q&A	Q&A	Democracy in the Developing World: Challenges & Models	Concept & Importance	2	31
Oral Questions	Oral Questions	Digital Transformation in Democratic Practice	Concept & Importance	2	32
Daily Quiz	Daily Quiz	The Democratic Experience in Iraq after 2003	Concept & Importance	2	33
Q&A	Q&A	Civil Society and Pressure Groups (Continued)	Concept & Importance	2	34

11. Course Evaluation

1. First Semester Exam: Monthly Exam + Daily Quiz (25 Degrees)
2. Second Semester Exam: Monthly Exam + Daily Quiz (25 Degrees)
3. Final Exam: (25 Degrees)

Learning and Teaching Resources

Human Rights and Democracy: A Curriculum for First-Year Students in Iraqi Universities.	Required Textbook
Dr. Musaddaq Adel Talib, Dr. Adnan Aajel Obaid, Dr. Ayat Salman Shuhaib, Dr. Mohammed Oudah Mohsen, Dr. Abbas Atiyah Abdul Al-Quraishi: Human .Rights Curriculum	Main References
Dr. Muntaser Majeed Hameed, Dr. Yasser Ali Ibrahim, Dr. Kadhim Ali Mahdi, Dr. Ahmed Yahya Hadi, Dr. Ihsan Mohammed Hadi, Dr. Anwar Saeed Jawad: .Democracy Curriculum	Supporting References

نموذج وصف المقرر

1. Course name: Crimes of the Ba ath regime in Iraq
2-UOA105 Course code .
3. Semester/Year: Annual
4-The date this description was prepared is 2/20/2026
5. Available forms of attendance: basic/in-person
6. Number of study hours (total)/number of units (total): 30 hours
8. Name of the course administrator (if more than one name is mentioned)
9- Name: Wasfi Kanaan Nasr al-Din al-Obaidi Email : Wasfi.k.nasruldeen@tu.edu.iq

1-Course objectives

	The decision: The general goal of this course is for the student to know the concept of crime The student should know the characteristics on which the ideas of the Baathist Party are based 1- That the student knows the crime and its concept 2- That the student knows the types of crime in the United Nations and its divisions 3- That the student knows the concept of the Baath Party, its mentality, its meaning and its reality 4- The student must conclude that what the party did during its rule was tantamount to dictatorship, oppression, and injustice 5- Developing the student's intellectual culture about each party - The student must know what the party's relationship with the people was, its dealings, and its style 7- The student must know that one of the reasons for the occupation of Iraq and the deterioration of the security situation is the result of the wrong policies of the party 8- The student must be aware that injustice and corruption have a dire and unsatisfactory end

	9- The student must know that the results of the party during its rule were starvation, war, injustice, mass graves, and the confinement of the idea of a civil state. .

1-Teaching and learning strategies	
Teaching and learning methods Theoretical lectures include the curriculum scheduled for this stage at a rate of 1 hour per week. And using various educational methods. Using various teaching methods, including discussion, dialogue, and cooperative education, to enhance students' confidence. Explanation and direct delivery using the necessary means to convey the idea	Strategy

1-Course structure

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

				es	
Daily exams and student participation in the lecture. oral exam Daily exams and student participation in the lecture. oral exam Daily exams and student participation in the lecture. oral exam Daily exams and student	Cooperative learning and discussion Lecture and ask questions	-The concept of crime - types of crime -Sections of crime and types of international crimes - decisions Issued by the criminal court -Daily exam - the United Nations concept of crime -Monthly exam - the most prominent phenomena, one of which is the party -Daily Exam - Party Violations of Human Rights -Decisions and violations of the party - the results of the zero uprising	-1 The student can explain the difference between the actions of the party and the actions of the party's figures 2- The student can explain the basis on which the party was built -3 The student can explain the meaning of the party in general and the Baath Party in particular -4 The student can explain the internal and external relationship of the party 5-The student can know the crime, its sections and types 6 To know the party's goals and components and what it is based on -7 The student can explain the meaning of the party in	2 2 2 2 2 2 2	1-2 3-4 5-6 7-8 9.10 11.12 13-14

participation in the lecture. oral exam		Places of the party's prisons - environmental crimes of the Baath Party	general and the Baath Party in particular		
Daily exams and student		The dangers of using internationally prohibited weapons - a daily exam	8- The student can explain the meaning of the party in general and the Baath Party in particular	2	15-16
participation in the lecture. oral exam		Effects of the chemical attack on Halabja and Basra - daily exam	-9 The student can explain the meaning of the party in general and the Baath Party in particular	2	17-18
Daily exams and student participation in the lecture. oral exam		The most important evidence of the scorched earth policy - a monthly exam	-10 The student can explain the internal and external relationship of the party	2	19-20
		-The most important effects resulting from dredging - the effects of drying up the marshes		2	21-22
		-Ymoi exam - the events of the party's mass graves		2	23-24
		-Events extending from 1967-2003 - the events of the genocide cemeteries		2	25-26

		Daily exam-report		2	27-28
		Locations of graves for Anfal and Intifada - a monthly examination		2	29-30

1-Course evaluation

To ask questions about educational topics for discussion by students in classes, ask questions for the student to solve.

Practical classes have daily quick exams with intellectual questions. And reports are customized

General and qualifying skills (other skills related to employability and personal development).

Follow up on external sources

Preparing questions from relevant sources and following the method of class discussions

Urging students to follow organizations, especially the Human Rights Organization

The evaluation method is annual

1- Monthly exam 30%

2-Daily exam 5%

3-Activity, participation and attendance 10%

4-Report 5%

5- Final exam 50%

Learning and teaching resources	
Methodical book	Required textbooks (methodology, if any)
nothing	Main references (sources)
nothing	Recommended supporting books and references (scientific journals, reports, the United Nations, human rights organizations...)
nothing	Electronic references, Internet sites

Course Description Form

Course Name: Sound and Wave Motion

1.

Course Code:

WMP042

Semester / Year:

Annual (2025-2026)

2. Description Preparation Date:

1/9/2025

Available Attendance Forms:

3.

In-person

4. Number of Credit Hours (Total) / Number of Units (Total)

2Hours/4unit

5. Course administrouator's name (mention all, if more than one name)

Name: Abdullah zahim nouri
Email: abdullah.zahem.tuz@tu.edu.iq

6. Course Objectives

Course Objectives	- The general objective of this course is to help students understand the basic concepts of sound and wave motion and to gain the skill of practical applications and conducting experiments: The student can identify sound, continuity, elasticity, and inertia. The student can also explain the physical meaning of sound

7. Teaching and Learning Strategies

Strategy	Course Outcomes, Teaching, Learning and Evaluation Methods The mechanism for applying the of physics theoretically to the scientific material and ways to understand them: A- Cognitive objectives The student can explain the physical meaning of sound. The student can explain the psychological meaning of sound. The student can show the origin of sound. The student can show the occurrence of sound. The student can mention the basic conditions for the occurrence and propagation of sound.

8. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2		Basic concepts What is wave motion and its types Means o energy transmission		

2 2 3 2 4 5 2 6 7 2 8 9 2 10 11 2 12 2 13 == = = = 14 = = 15 = = = 16 17 18 2 19 2 20 21 2 22 23 2 24 2	2 Explanation and direct delivery using the necessary means to cor the idea. • Conducting experime	Basic properties of the occurrence and transmission of waves, mechanical wave motion Transmission of wave motion and wave motion models Sound waves and types of wave motion Vibration theory, vibrational motion Simple harmonic motion and solving th equation of simple harmonic motion Synthesis of simple harmonic motion, composition rule Synthesis of two harmonic motions in t same direction Lisogo figures Representation of the harmonic motion the rotation vector Damaged vibration, forces causing the decaying vibration Simple harmonic motion equation for th decaying vibration Solving the equation of simple harmoni motion for the decaying vibration Forced vibration Equation of motion for the decaying oscillator Importance of transient and forced vibrations, vibration amplitude Resonance Longitudinal waves in one dimension, transverse waves in one dimension Equation Transverse wave , Equation of transverse waves in one dimension Long wave in a metal rod, natural frequency of a metal rod fixed at two en Longitudinal waves in a fluid column Equation of motion for a metal rod fixe one end Equation of wave motion in two dimensions, solving the wave equation two dimensions Natural vibrations of finite membranes	Theoretical lecture	Exams homework preparation

25 26	2 2		Resonator, types of resonators		

9. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc	
10. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The curriculum book and auxiliary books
Main references (sources)	Book (Physics of Sound and Wave Motion) by Dr. Amjad Abdul Ra Karajiya
Recommended books and references (scientific journals, reports...)	Using the library and the information network to obtain s information and student abilities
Electronic References, Websites	Scientific encyclopedias

Course Description Form

1- The name of the course:
Mathematics-Second Stage-Physics Section
2- Course code:
MAP022
3- Semester/Year: Annual
2025 – 2026
4- Date of preparation of this description
9/11/2025
5- Available Attendance Forms
In-person
6- Number of study hours (total) / Number of units (total)
90 hours / 6 units
7- Name of the course leader (if more than one)
Name: Asst. Prof. Dr. Ibrahim Salih Ahmed **Email: Ibrahim1992@tu.edu.iq**
1. Course Objectives
-Define the basics of mathematics and its applications. -Enable students to study the basics of mathemati -Student's knowledge of the most important applications in mathematics. -Enable the student to keep pace with scientific development. -Enable the student to obtain knowledge and understanding of effective media. In addition to increasing his knowledge of the mo important applications of mathematics in the field of life
2. Teaching and Learning Strategies
- Lectures and the use of textbooks -Solving problems related to the subject matter -Writing scientific reports and analysing data -Using e-learning in teaching according to possibilities available. -Self-learning method -Brainstorming -Lecture time feedback - Collaboration and feedback loop
3. Course structure

Week	Hours	Required Learning Outcomes	Unit or topic name	Instruction Method	Assessment method

1	٣	Introduce the student to sequences and their types	finite -Sequence sequence-infinite sequence	Blackboard/ Data Show	Daily Exam – Monthly Exams
2	٣	Introduce students to convergent and divergent sequences	Convergent sequences –divergent sequences	=	=
3	٣	Solving Different Exercises	Solve exercises, proofs and discussion	=	=
4	٣	Introduce to geometric series	Geometric series	=	=
5	٣	introduce to the types and methods of convergent sequential methods	Method of convergent	=	=
6	٣	Solving Different Exercises	Solve exercises, proofs and discussion	=	=
7	٣	Introducing the Power Series	The power series	=	=
8	٣	Introducing the Tyler Series	The Taylor series	=	=
9	٣	Solving Different Exercises	Solve exercises, proofs and discussion	=	=
10	٣	Introducing the McLaurin Series	Maclaurin polynomial-computation of logarithms	=	=
11	٣	Introducing the Fourier Series	Fourier series	=	=
12	٣	Solving Different Exercises	Solve exercises, proofs and discussion	=	=
13	٣	Introducing Vectors	the Vectors	=	=
14	٣	Introduce students to unit vectors	Unite vector	=	=
15	٣	Solving Different Exercises	Solve exercises, proofs and discussion	=	=
16	٣	Introduce students to the dot product and cross product of vectors	Scalar product-scalar dot product	=	=
17	٣	Introduce students to vector projection and periodic projection.	Vector projection-scalar projection	=	=
18	٣	Introduce students to solving the equations sphere, line, and plane	Equation of sphere-line-plane	=	=
19	٣	Introduce the student to partial derivatives	Partial differential	=	=

20	٣	Solving Different Exercises	Solve exercises, proofs and discussion	=	=
21	٣	introduce the student to one of the methods for solving partial derivatives.	The chair rule	=	=
22	٣	Introduce the student to the vector derivative and multiple differentiations.	Vector differential-higher order differential	=	=
23	٣	Introduce the student to major and minor limits and the critical point.	Local max-local mim-critical point	=	=
24	٣	Introduce the student to the differential equation and the general and special solution.	The differential equation-general – special solution	=	=
25	٣	introduce students to separable, homogeneous, and heterogeneous differential equations.	Separable-homogenous-non homogenous diff.equation	=	=
26	٣	Solving Different Exercises	Solve exercises, proofs and discussion	=	=
27	٣	Introduce the student to complete, incomplete, and linear differential equations.	Exact non-exact –linear diff.equation	=	=
28	٣	Introduce the student to special cases of the second order.	Special types of second order	=	=
29	٣	Introduce the student to Laplace transforms.	Laplace transformation	=	=
30	٣	Solving Different Exercises	Solve exercises, proofs and discussion	=	=

1. Course evaluation

Distribute 100 marks according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, reports, etc.

2. Learning and Teaching Resources

1- Required textbooks (syllabus if any)	1-Principles of Lasers ,O.Svelto, 2nd Edition , Plenum Press . New York and London , 1998.
Main References (Sources)	1- Laser and their applications, M .J. Beesley, Taylor & Franci LTD, 1976. 2- Introduction to optical electronics , Amnon Yariv, Holt Richard Winston, 1976.
Recommended supporting books and references (scientific journals, reports ....)	Calucales

Electronic references, websites	Various websites

نموذج وصف المقرر

١. 1. Course Name: Arabic Language – Second Yea
٢. 2. Course Code: LughArab 017
3. Semester / Academic Year: Annual
4. Date of Preparation: Beginning of the Academic Year 2025–2026
5. Available Attendance Mode: In-person (On-campus)
6. Total Teaching Hours / Credits: 30 Teaching Hours Credits: 1
7. Course Instructor
Name: Assist. Lect. Ibrahim Youssef Ibrahim Email : ibrahim.youssef@tu.edu.iq
8. Course Objectives
8. Course Objectives This course aims to: 1. Provide students with new knowledge in Arabic language studies. 2. Enable students to understand and apply Arabic grammar (Nahw). 3. Enable students to acquire knowledge and understanding of morphology (Sarf) and Arabic literature. 4. Develop students' skills in spelling (orthography) and written expression. 5. Enhance students' ability to identify and correct common linguistic errors.
9. Teaching and Learning Strategies

	9. Teaching and Learning Strategies • Brainstorming. • Classroom discussion and dialogue. • Cooperative learning (group note-taking). • Interactive lectures. • Analytical classroom activities.

10. Course Structure

Week	Assessment Method	Teaching Method	Topic	Hours	Week
1	Direct questions / Weekly test	Lecture & board explanation	The Holy Qur'an	1	1
2	Direct questions / Weekly test	Lecture & board explanation	Prophetic Hadith	1	2
3	Direct questions	Lecture & board explanation	Abu al-Ala al-Ma'arri	1	3
4	Direct questions	Lecture & board explanation	Badr Shakir al-Sayyab	1	4
5	Weekly test	Lecture & board explanation	Present Tense Verb	1	5
6	Weekly test	Lecture & board explanation	Subjunctive Mood of the Present Verb	1	6
7	Monthly exam	Written test	Monthly Exam	1	7
8	Weekly test	Lecture & board explanation	Jussive Mood of the Present Verb	1	8
9	Weekly test	Lecture & board explanation	Indicative Mood of the Present Verb	1	9
10	Direct questions	Lecture & board explanation	Mustafa Jamal al-Din	1	10

11	Weekly test	Lecture & board explanation	Muhammad Mahdi al-Jawahiri	1	11
12	Weekly test	Lecture & board explanation	Rules of Writing (Taa')	1	12
13	Weekly test	Lecture & board explanation	Rules of Writing (Alif)	1	13
14	Weekly test	Lecture & board explanation	Writing (Dhad and Dha')	1	14
15	Monthly exam	Written test	Monthly Exam	1	15
16	Weekly test	Lecture & board explanation	Noun Morphology	1	16
17	Weekly test	Lecture & board explanation	Gender in Nouns (Masculine & Feminine)	1	17
18	Weekly test	Lecture & board explanation	Numbers and Their Rules	1	18
19	Weekly test	Lecture & board explanation	Appositives (At-Tawabi')	1	19
20	Weekly test	Lecture & board explanation	Ilm al-Badi' (Rhetorical Embellishment)	1	20
21	Weekly test	Lecture & board explanation	Common Linguistic Errors	1	21
22	Weekly test	Lecture & board explanation	Stages of Arabic Language Compilation	1	22
23	Weekly test	Lecture & board explanation	Lexicons and Semantics	1	23
24	Weekly test	Lecture & board explanation	Selected Qur'anic Texts	1	24
25	Monthly exam	Written test	Monthly Exam	1	25
26	Weekly test	Lecture & board explanation	Genitive Constructions	1	26

27	Weekly test	Lecture & board explanation	Accusative Constructions	1	27
28	Comprehensive questions	General revision	Comprehensive Review	1	28
29	Monthly exam	Written test	Monthly Exam	1	29
30	Final examination	Written test	Final Exam	1	30

11. Course Assessment

- Written examinations (monthly and final).
- Oral examinations.
- Analytical and critical-thinking questions.
- Classroom participation
-

12. Learning and Teaching Resources

• Arabic Grammar books. • Morphology books. • Rhetoric books (Balagha). • Classical and Modern Arabic Literature sources. • Standard Arabic dictionaries and lexicons	If you would like, I can also
mat it according to international accreditation standards (e.g., learning outcomes	If you would like, I can also

Course description form

1. Course name: Curriculum and textbook
Foundations of Education
2. Course code: CREQ202
ARLA 208
3. Semester/Year:
Annual
4. The date this description
was prepared is the beginning of the 2025-2026 academic year
5. vailable forms of attendance:
In person
6. Number of study hours (total) / number of units (total):
60 hours, number of units: 3
7. Name of the course administrator (if more than one name is mentioned/ (
Name:Dr. Zainab Chalabi Mohamad Ramadhan Mohammad qadar Email zinab.g.mohamad@tu.edu.iq
8. Course objectives

General Objectives •To understand the difference between the old and modern curricula •To understand the foundations of the modern educational curriculum •To understand modern strategies •To know the importance of the textbook A- Cognitive Objectives A1- For the student to possess knowledge and information about the difference between the old and modern curricula A2- For the student to understand the meaning of educational foundations A3- To comprehend the basic principles of educational foundations A4- For the student to become familiar with modern strategies A5- For the student to be provided with information and knowledge about digital content A6- For the student to understand the meaning of mobile learning.	B. Program-Specific Skills Objectives B1. Developing the student's skills towards enhancing research and academic achievement. B2. Developing the student's skills towards increasing the effectiveness of academic achievement. B3. Developing the student's skills towards improving interpersonal skills. B4. Developing the student's skills in teaching methodologies. C. Affective and Value-Based Objectives C1. That the student adheres to professional ethics. C2. That the student possesses literary and humanistic thinking skills. C3. That the student possesses critical thinking skills. C4. That the student possesses decision-making skills. C5. That the student listens attentively to the lesson topic. C6. That the student responds to questions related to the old and new curriculum. C7. That the student accepts the curriculum material and textbook. Q8- The student should compare the old curriculum with the new curriculum. Q9- The student should evaluate the curriculum and textbook.

9. Teaching and learning strategies	
- Brainstorming, dialogue and discussion, and some classroom activities. - Using educational discussion (educational dialogue), which depends on exchanging ideas to reach facts. - Collective memorandum to involve all students in classroom activity. - Presentations	
10. Course structure	

week	Watches	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
1	3	The concept of curriculum, the difference between the old and modern curriculum, principles and features	The concept of curriculum, the difference between the old and modern curriculum, principles and features	Dialogue, discussion and brainstorming Presentations	Oral and written test
2	3	The hidden approach	The hidden approach	Dialogue, discussion and brainstorming Presentations	Oral and written test
3	3	Knowledge economy approach	Knowledge economy approach	Dialogue, discussion and brainstorming Presentations	Oral and written test
4	3	Digital curriculum	Digital curriculum	Dialogue, discussion and brainstorming Presentations	Oral and written test
5	3	Social, educational, psychological, and cognitive foundations in building modern curricula	Social, educational, psychological, and cognitive foundations in building modern curricula	Dialogue, discussion and brainstorming Presentations	Oral and written test
6	3	Foundations of the modern educational approach	Foundations of the modern educational approach	Dialogue, discussion and brainstorming Presentations	Oral test
7	3	Technological foundations and their impact on curriculum design	Technological foundations and their impact on curriculum design	Dialogue, discussion and brainstorming Presentations	Oral and written test
8	3	competency-based approach	competency-based approach	Dialogue, discussion and brainstorming Presentations	Oral and written test

9	3	Project-based approach	Project-based approach	Dialogue, discussion and brainstorming Presentations	Oral and written test
10	3	Problem-solving approach	Problem-solving approach	Dialogue, discussion and brainstorming Presentations	Oral and written test
11	3	Interactive digital curricula	Interactive digital curricula	Dialogue, discussion and brainstorming Presentations	Oral and written test
12	3	AI-based curricula	AI-based curricula	Dialogue, discussion and brainstorming Presentations	Oral and written test
13	3	Blended curricula and blended learning	Blended curricula and blended learning	Dialogue, discussion and brainstorming Presentations	Oral and written test
14	3	The STREAM approach and its connection to educational reality	The STREAM approach and its connection to educational reality	Dialogue, discussion and brainstorming Presentations	Oral and written test
15	3	Educational objectives in light of 21st century skills	Educational objectives in light of 21st century skills	Dialogue, discussion and brainstorming Presentations	Oral and written test
16	3	Digital content in modern curricula	Digital content in modern curricula	Dialogue, discussion and brainstorming Presentations	Oral and written test
17	3	Traditional content in modern curricula	Traditional content in modern curricula	Dialogue, discussion and brainstorming Presentations	Oral and written test
18	3	Modern teaching methods: (participatory learning)	Modern teaching methods: (participatory learning)	Dialogue, discussion and brainstorming Presentations	Oral and written test
19	3	Game-based learning	Game-based learning	Dialogue, discussion and brainstorming Presentations	Oral and written test
20	3	Learning through virtual reality	Learning through virtual reality	Dialogue, discussion and brainstorming	Oral and written test

				Presentations	
21	3	Modern teaching strategies (project-based learning)	Modern teaching strategies (project-based learning)	Dialogue, discussion and brainstorming Presentations	Oral and written test
22	3	flipped learning	flipped learning	Dialogue, discussion and brainstorming Presentations	Oral and written test
23	3	Mobile learning	Mobile learning	Dialogue, discussion and brainstorming Presentations	Oral and written test
24	3	The role of the teacher in light of digital transformations in education	The role of the teacher in light of digital transformations in education	Dialogue, discussion and brainstorming Presentations	Oral and written test
25	2	The concept of assessment in modern curricula	The concept of assessment in modern curricula	Dialogue, discussion and brainstorming Presentations	Oral and written test
26	3	The role of artificial intelligence applications in education	The role of artificial intelligence applications in education	Dialogue, discussion and brainstorming Presentations	Oral and written test
27	3	Curriculum development according to quality standards and academic accreditation	Curriculum development according to quality standards and academic accreditation	Dialogue, discussion and brainstorming Presentations	Oral and written test
28	3	Curricula and Globalization (Global Curriculum and Local Curriculum)	Curricula and Globalization (Global Curriculum and Local Curriculum)	Dialogue, discussion and brainstorming Presentations	Oral and written test
29	3	The importance of textbooks in the context of digital learning	The importance of textbooks in the context of digital learning	Dialogue, discussion and brainstorming Presentations	Oral and written test
30	3	How to integrate textbooks and digital learning	How to integrate textbooks and digital learning	Dialogue, discussion and brainstorming Presentations	Oral and written test
11. Course evaluation					
•Theoretical exams •Questions outside the box					

•Oral exams	
12. Curriculum and textbook	
Main references (sources)	Abdul Wahab Abdul Jabbar, M. & Batoul Fadhil Jawad, M. (2023). Curriculum and Textbook. Baghdad: Noor Al-Hassan Printing and Typesetting Press. This book discusses the relationship between the curriculum and the textbook and their role in achieving educational .objectives uodiyala.edu.iq Saleh, R. A. & Dakhel, S. T. (2018). Curriculum and Textbook. Baghdad: Noor Al-Hussein Library for Printing and Typesetting. This book addresses the principles of the curriculum and its relationship to the textbook.
Recommended supporting books and references (scientific journals, reports...)	Zoul, Y. & Bakari, T. (2025). Curriculum and Textbook: An Evaluative Approach. Ata'a Journal of Studies and Research (Conferences and Seminars), 49–72. A study evaluating the .relationship between textbooks and curriculum journals.imist.ma Ibrahim, H. (2012). How to Write a Textbook. Nilein University, Sudan. A study explaining the components of textbook writing and its relationship to curriculum.
Electronic references, websites	Jordanian Ministry of Education. (n.d.). Curriculum and Textbook Department. Jordanian Ministry of Education website. Retrieved from https://aqau.moe.gov.jo/ar/إدارة-المناهج-والكتب-المدرسية aqau.moe.gov.jo Al-Watan Newspaper. (2024, March 25). The Ministry of Education's Journey in Developing Curricula and Textbooks. Al-Watan website. Retrieved from https://www.elwatannews.com/news/details/723469

Course Description Form

1. Course Name:
English Language/Second Stage
2. Course Code:
3. Semester / Year:
Year
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Presence
6. Number of Credit Hours (Total) / Number of Units (Total)
3o Hours/ 2 units each hour.
7. Course administrator's name (mention all, if more than one name)
Name: Maali Sattar Namuq Email: maaly.a.namuq@tu.edu.iq

8. Course Objectives	
Course Objectives	The aim of this course is to introduce the student to the importance of the scientific subject –Describe all aspects of language teaching, including reading, writing, listening, and speaking –Empowering the student to rely on himself in applying the scientific material in his academic life.

9. Teaching and Learning Strategies	
Strategy	1- Lecture method and use of the interactive whiteboard 2-Explanation and clarification 3- Providing students with the basics and additional topics Related to thinking outcomes. 4- Asking the students questions and forming discussion groups during lectures to discuss the solution to the questions posed to them. 5- Giving homework to students.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
30 weeks	Each hour weekly		1-2-the tense system: Present and past simple And continuous 3-Reading:people, the great communicator's -the many ways communicates 4-5-thetense system: present and past Perfect, passive and Active 6-linking words: but, However 7-Question and negative 8-Quantity: much and many 9-Expressions of Quantity: A few and a little 10-Future forms 11-Vocabulary: hot verbs, take and put 12-Informal letters 13-Comparative and Superlative adjective 14- Hypothesizing: spoken English (If) 15-Articles	Presence Diction Direct And the means Illustrations With Electronic Program (Class -room)	Oral Questions Daily exams Homework Monthly Exams Final exam

			16- Review 17- First exam 18-Determiners 19-Writing letters, Biography and e-mails 20-Adverbs 21-Exclamations 22-Indirect questions 23-Time expressions 24-Agreeing and Disagreeing 25-Review 26- Time expressions 27-Adescription 29- second exam 30-Review		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc
Asking questions about topics that can be discussed by students in class and asking questions that the student can solve.
Classes have daily exams and intellectual questions.
Preparing external questions from supporting sources and following up on the method of class discussions.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	New Headway: Pre-Intermediate students English Languag

Main references (sources)	English Grammar in Use
Recommended books and references (scientific journals, reports…)	Any book that deals with the basics of the English language
Electronic References, Websites	

Course Description Form

1. Course Name:
Electrical II
2. Course Code:
ELP032
3. Semester / Year:
Annual
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 4 unit
7. Course administrator's name (mention all, if more than one name)
Name: Prof. D. Nihad Ali Shafeek Email: nihadshafeek2026@tu.edu.iq

8. Course Objectives	
Course Objectives	1. Introducing the student to the importance of the scientific Electrical for the course 2. Describing all the movements in direction and the mechanism for applying them. 3. Enabling the student to rely on himself in the Electrical for applying the scientific magnetism in solving all problems.

9. Teaching and Learning Strategies

Strategy	Lecture, dialogue, discussion, and giving examples.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1)	2	Built and Safford Law	Electrical field	Lecture and discussion	Daily exams and homework in addition to monthly exams
2)	2	Bipolar magnetism	Electrical field	Lecture and discussion	Daily exams and homework in addition to monthly exams
3)	2	Helmholtz coils	Coil	Lecture and discussion	Daily exams and homework in addition to monthly exams
4)	2	Exercise Solation	Cables	Lecture and discussion	Daily exams and homework in addition to monthly exams
5)	2	Solenoid and Toroid coils	Coil	Lecture and discussion	Daily exams and homework in addition to monthly exams
6)	3	Magnetism properties	Materials	Lecture and discussion	Daily exams and homework in addition to monthly exams
7)	3	Electromagnetic and faradays law	Faradays	Lecture and discussion	Daily exams and homework in addition to monthly exams
8)	2	Solation	Example	Lecture and discussion	Daily exams and homework in addition to monthly exams
9)	2	Electromotive Force	Coils	Lecture and discussion	Daily exams and homework in addition to monthly exams
10)	2	-	First examination	-	Daily exams and homework in addition to monthly exams
11)	2	Electrical generator	Generator	Lecture and discussion	Daily exams and homework in addition to monthly exams
12)	2	Amperes Law	Ampere	Lecture and discussion	Daily exams and homework in addition to monthly exams
13)	2	Eddy Currents	current	Lecture and discussion	Daily exams and homework in

					addition to monthly exams
14)	2	Maxwell's equations	Maxwell	Lecture and discussion	Daily exams and homework in addition to monthly exams
15)	2	Inductors and inductance	Examples	Lecture and discussion	Daily exams and homework in addition to monthly exams
16)	2	Power in capacitors	capacitors	Lecture and discussion	Daily exams and homework in addition to monthly exams
17)	2	RL – circuit	Circuit	Lecture and discussion	Daily exams and homework in addition to monthly exams
18)	2	LC-circuit	Circuit	Lecture and discussion	Daily exams and homework in addition to monthly exams
19)	2	RLC_ Circuit	Applications	Lecture and discussion	Daily exams and homework in addition to monthly exams
20)	2	-	Second exam	-	Daily exams and homework in addition to monthly exams
21)	2	Alternating current circuit	Alternating circuit	Lecture and discussion	Daily exams and homework in addition to monthly exams
22)	2	RLC Alternating sequence	Alternating circuit	Lecture and discussion	Daily exams and homework in addition to monthly exams
23)	2	RLC- parallel	Examples	Lecture and discussion	Daily exams and homework in addition to monthly exams
24)	2	Solation	Example	Lecture and discussion	Daily exams and homework in addition to monthly exams
25)	2	Power Alternating current circuit	Power	Lecture and discussion	Daily exams and homework in addition to monthly exams
26)	2	Solation power	Example	Lecture and discussion	Daily exams and homework in addition to monthly exams
27)	2	Solation examples	Example	Lecture and discussion	Daily exams and homework in addition to monthly exams

28)	2	Translator examples	Example	Lecture and discussion	Daily exams and homework in addition to monthly exams
29)	2	Applications general	General	Lecture and discussion	Daily exams and homework in addition to monthly exams
30)	2	-	Third exam	Lecture and discussion	Daily exams and homework in addition to monthly exams

11. Course Evaluation

Distributing the score out of 50 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Electrical and magnetism by Yarmuk University Jordon
Main references (sources)	Peppers
Recommended books and references (scientific journals, reports…)	Any book that deals with the basics of Electrical and its applications
Electronic References, Websites	Any website that deals with Electrical

13. Curriculum Development Plan

- Familiarity with all that is new and innovative in teaching and learning strategies.
- Benefit from the latest scientific research results for applications of Electrical and magnetism in physics.
- Apply some modern teaching strategies

Course Description Form

1. Course Name:
Electrical II
2. Course Code:
ELP032
3. Semester / Year:
Annual
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 1 unit
7. Course administrator's name (mention all, if more than one name)
Name: Prof. D. Nihad Ali Shafeek Email: nihadshafeek2026@tu.edu.iq

8. Course Objectives	
Course Objectives	1. Introducing the student to the importance of the scientific Electrical for the course 2. Describing all the movements in direction and the mechanism for applying them. 3. Enabling the student to rely on himself in the Electrical for applying the scientific magnetism in solving all problems.

9. Teaching and Learning Strategies

Strategy	Lecture, dialogue, discussion, and giving examples.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	Ohms Law	Ohms Law investigation	Lecture and discussion	Daily exams and homework in addition to monthly exams
3-4	4	Conduct R	Parallel and series	Lecture and discussion	Daily exams and homework in addition to monthly exams
5-6	4	Capacitor	Value of capacitor	Lecture and discussion	Daily exams and homework in addition to monthly exams
7-8	4		First examination	Lecture and discussion	Daily exams and homework in addition to monthly exams
9-10	4	Ammeter	R of Ammeter	Lecture and discussion	Daily exams and homework in addition to monthly exams
11-12	4	Voltmeter	R- Voltmeter	Lecture and discussion	Daily exams and homework in addition to monthly exams
13-14	4	Coils	Value of Coil	Lecture and discussion	Daily exams and homework in addition to monthly exams
15-16	4		Second Examination	Lecture and discussion	Daily exams and homework in addition to monthly exams
17-18	4	Translator	Efficiency of Translator	Lecture and discussion	Daily exams and homework in addition to monthly exams
19-20	4	Galvanometer	Value of Galvanometer	-	Daily exams and homework in addition to monthly exams
21-22	4	Ohms law	Value of R	Lecture and discussion	Daily exams and homework in addition to monthly exams
23-24	4	Capacitor	Value of C	Lecture and discussion	Daily exams and homework in addition to monthly exams
25-26	4	Series circuit	Value of eq. R	Lecture and discussion	Daily exams and homework in

					addition to monthly exams
27-28	4	Parallel circuit	Value of eq. R	Lecture and discussion	Daily exams and homework in addition to monthly exams
20-30	4		Third examination	Lecture and discussion	Daily exams and homework in addition to monthly exams

11. Course Evaluation

Distributing the score out of 50 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Electrical and magnetism by Yarmuk University Jordon
Main references (sources)	Peppers
Recommended books and references (scientific journals, reports…)	Any book that deals with the basics of Electrical and its applications
Electronic References, Websites	Any website that deals with Electrical

13. Curriculum Development Plan

- Familiarity with all that is new and innovative in teaching and learning strategies.
- Benefit from the latest scientific research results for applications of Electrical and magnetism in physics.
- Apply some modern teaching strategies

Course Description Form

1. Course Name:
Computer
2. Course Code:
H016
3. Semester / Year:
Annual
4. Description Preparation Date:
٢٠٢٥-٢٠٢٦
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours / 1 unit
7. Course administrator's name (mention all, if more than one name)
Name: kamaran Adil Ibrahim **Email: kamaran zm@tu.edu.iq**

8. Course Objectives	
Course Objectives	* Preparing and qualifying specialists to meet the requirements of the labor market in its public and private sectors by diversifying teaching and learning methods and training students to apply acquired knowledge and skills to solve real-world problems. * Creating an appropriate climate for students to enable them to apply their acquired knowledge and skills in identifying the needs and problems of society and social matters related to computers and information technology. * Providing distinguished academic programs in the field of computers, both theoretical and practical, that are consistent with international standards of academic quality and

	meet the needs of the labor market. *** Encouraging and developing scientific research in the fields of computers in general** **and in the areas of office software suites (Office) in particular.** *** Developing the scientific and technical capabilities in educational laboratories and** **providing all their requirements.** *** Providing specialized laboratories for scientific research equipped with scientific** **capabilities to provide an opportunity for teaching staff to develop their abilities.** *** Working to publish scientific and qualitative articles and publications that keep pace** **with the information development wheel in the world.** *** Holding specialized scientific conferences.**

9. Teaching and Learning Strategies

Strategy	Lecture method, laboratory dialogue, discussion, and giving examples.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	What is a network? Types of networks. Basic network components.	Introduction to Computers	Theoretical lecture	General questions, discussion, and monthly exams.
2	1	Basic network components.	Security and Networking	Theoretical lecture	General questions, discussion, and monthly exams.
3	1	Network Security Basics. Understanding network threats. Network Troubleshooting	Security and Networking	Theoretical lecture	General questions, discussion, and monthly exams.
4	1	Introduction to Network	Security and Networking	Theoretical lecture	General questions, discussion,

		Troubleshooting, Common Network Issues and Symptoms, Network Troubleshooting Tools and Utilities.			and monthly exams.
5	1	Using Command- Line Tools for Diagnostics, Identifying and Resolving Connectivity Issues, Diagnosing Network Performance Problems	Security and Networking	Theoretical lecture	General questions, discussion, and monthly exams.
6	1	Electronic banking services this include online banking: ATM and debit card services.	E-Commerce	Theoretical lecture	General questions, discussion, and monthly exams.
7	1	Phone banking, SMS banking, electronic alert, Mobile banking.	E-Commerce	Theoretical lecture	General questions, discussion, and monthly exams.
8	1	Introduction to Computer Troubleshooting, Common Hardware Issues and Solutions, Diagnosing Software Problems.	Computer Troubleshooting	Theoretical lecture	General questions, discussion, and monthly exams.
9	1	Hardware Components: Diagnosis and Repair, Using	Computer Troubleshooting	Theoretical lecture	General questions, discussion,

		Safe Mode for Troubleshooting.			and monthly exams.
10	1	Troubleshooting Operating System Issues, Identifying and Resolving Blue Screen Errors, Dealing with Slow Computer Performance	Computer Troubleshooting	Theoretical lecture	General questions, discussion, and monthly exams.
11	1	Virus and Malware Removal Techniques, Updating Drivers and Software.	Computer Troubleshooting	Theoretical lecture	General questions, discussion, and monthly exams.
12	1	Definition of AI, History of AI, AI Techniques and Approaches.	Introduction to AI	Theoretical lecture	General questions, discussion, and monthly exams.
13	1	Key Characteristics of AI, Benefits of AI, Challenges and Ethical considerations.	Introduction to AI	Theoretical lecture	General questions, discussion, and monthly exams.
14	1	Challenges and Limitations of AI, The Role of Data in AI Systems.	Introduction to AI	Theoretical lecture	General questions, discussion, and monthly exams.
15	1	AI Tools and Frameworks.	Introduction to AI	Theoretical lecture	General questions, discussion, and monthly exams.
16	1	AI-Driven Mobile Technologies, Virtual Assistants (Siri,	The Role of AI in Modern Smartphones	Theoretical lecture	General questions, discussion, and monthly exams.

		Google Assistant, Alexa).			
17	1	Adaptive Learning, Real-Time Translation Services.	The Role of AI in Modern Smartphones	Theoretical lecture	General questions, discussion, and monthly exams.
18	1	The Future of AI in Smartphone Technology, Challenges of Implementing AI in Mobile Devices.	The Role of AI in Modern Smartphones	Theoretical lecture	General questions, discussion, and monthly exams.
19	1	Overview of AI Applications in Various Industries, Education and Healthcare.	Applications and Tools of AI	Theoretical lecture	General questions, discussion, and monthly exams.
20	1	Transportation and Advertising.	Applications and Tools of AI	Theoretical lecture	General questions, discussion, and monthly exams.
21	1	Finance, Robotics and Automation Technologies..	Applications and Tools of AI	Theoretical lecture	General questions, discussion, and monthly exams.
22	1	AI in Marketing: Targeting and Personalization.	Applications and Tools of AI	Theoretical lecture	General questions, discussion, and monthly exams.
23	1	AI in Image and Video Analysis, Smart Cities	Applications and Tools of AI	Theoretical lecture	General questions, discussion, and monthly exams.

24	1	Future Trends in AI Applications and Tools.	Applications and Tools of AI	Theoretical lecture	General questions, discussion, and monthly exams.
25	1	Introduction to AI and Its Societal Impact, The Role of AI in Enhancing Public Safety.	AI and Society	Theoretical lecture	General questions, discussion, and monthly exams.
26	1	Cultural Perspectives on AI Adoption, AI and Governance: Policy Implications	AI and Society	Theoretical lecture	General questions, discussion, and monthly exams.
27	1	Introduction to Ethics in AI, Transparency and Explainability of AI Systems, Privacy Concerns in AI Data Usage.	**Ethical Challenges in AI**	Theoretical lecture	General questions, discussion, and monthly exams.
28	1	The Ethical Implications of Autonomous Systems, Ethics in AI-Driven Marketing and Advertising	Ethical Challenges in AI	Theoretical lecture	General questions, discussion, and monthly exams.
29	1	Ethical Considerations in Education, Human Rights and AI Implementation	Ethical Challenges in AI	Theoretical lecture	General questions, discussion, and monthly exams.

30	1	Future trends in AI, recent research and emerging technologies.	The Future of AI	Theoretical lecture	General questions, discussion, and monthly exams.

11. Course Evaluation

Distribution of the 25 marks according to the tasks assigned to the student, such as daily preparation, daily, monthly, and written exams, etc.

12. Learning and Teaching Resources

Recommended supporting books and referen (scientific journals, reports…):	Theses and Dissertations
Electronic references, internet sites:	Electronic Research

13. Curriculum Development Plan

- Familiarity with the latest developments in teaching and learning strategies.
- Using modern technology and scientific reports through illustrative videos to consolidate the scientific material visually.

Course Description Form

1. Course Name:
Astronmy
2. Course Code:
SSP052
3. Semester / Year:
Annual
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 4 unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Zainab Sameen Ali Email: zainabsali@tu.edu.iq

8. Course Objectives	
Course Objectives	Study some basic concepts related to astrophysics, including: • Giving an introduction to astrophysics, the celestial sphere and its parts, identifying the most important parts of the celestial sphere in addition to astronomical coordinates and astronomical units of measurement. • Identifying the constellations that appear in the sky according to the four astronomical seasons. • Identifying the zodiac region, the zodiac circle, and the celestial signs and the difference between them and the rest of the constellations. • Identifying astronomical phenomena and identifying the phenomena of precession and swaying related to the Earth's axis.

	• Studying the physical properties of the sun, identifying its layers and identifying the phenomena occurring on its surface. • Addressing some theories related to studying the movement of celestial bodies around the sun (Kepler's laws) • Studying the physical properties of the moon and identifying methods for measuring the moon's distance from the earth. • Identifying the orbital and axial movements of the moon • Identifying the phenomena of eclipses and solar eclipses, their types and the reason for their occurrence, in addition to the difference between them. • Study the solar system including the sun, planets, satellites, celestial bodies and cosmic bodies including asteroids, meteors, meteorites and comets. • Identify the physical properties of stars (magnitudes, luminosity, radii, ages, etc.) • Identify the types of binary and multiple stars and study galaxies

9. Teaching and Learning Strategies

Strategy	Lecture, dialogue, discussion, and giving examples.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-4	8	Study the celestial sphere, including celestial bodies, systems for determining the location of celestial bodies, defining constellations, knowing the constellations, learning about astronomical units of measurement, and the movements of the Earth's axis.	Chapter One / General Introduction to Astronomy	Lecture and discussion	Daily exams and homework in addition to monthly exams

5-10	12	Study the physical properties of the sun, learning about its layers, learning about the phenomena occurring on the surface of the sun, studying the physical properties of the moon, learning about methods of measuring the distance of the moon from the earth, and then learning about the orbital and axial movements of the moon, the phenomena of eclipses and their types, and the reason for their occurrence.	Chapter Two / The Sun and the Moon	Lecture and discussion	Daily exams and homework in addition to monthly exams
11-16	12	Study the solar system, including the sun, planets, satellites, celestial bodies, and cosmic bodies, including asteroids,	Chapter Three / The Solar System	Lecture and discussion	Daily exams and homework in addition to monthly exams

		meteors, meteorites, and comets.			
17-22	12	Study the physical properties of stars (their apparent and absolute magnitudes, their luminosity, their radii, their ages,) and the relationship between the mass of stars and their luminosity.	Chapter Four / Physical Properties of Stars	Lecture and discussion	Daily exams and homework in addition to monthly exams
23-25	6	Study the types of binary and multiple stars.	Chapter Five / Stellar Systems and Variables	Lecture and discussion	Daily exams and homework in addition to monthly exams
26-28	6	Study the types of galaxies, the stellar population in the galaxy, and star clusters.	Chapter Six / Galaxies	Lecture and discussion	Daily exams and homework in addition to monthly exams
29-30	4	-	Review	-	Daily exams and homework in addition to monthly exams

11. Course Evaluation

Distributing the score out of 50 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Dr. Hamid Majul Al-Naimi and Fayyadh Al-Najm. Atmospheric and Space Physics (Part One) Astronomy,

	Iraqi Ministry of Higher Education and Scientific Research, 1981.
Main references (sources)	Hamid Majul Al-Naimi and Fayyadh Al-Najm. Atmospheric and Space Physics (Part One) Astronomy, Iraqi Ministry of Higher Education and Scientific Research, 1981
Recommended books and references (scientific journals, reports…)	Astronomy Michael Youssef Slawans
Electronic References, Websites	Educational Physics Websites

13. Curriculum Development Plan

The increasing use of information technology, the extraction of reliable electronic books, and the updating of vocabulary and curricula to ensure keeping pace with the great development in astronomy and continuing to read reliable research published in high-level reliable journals, which ensures the development of teaching ability.

Course Description Form

1. Course Name:
Educational Leadership and Management / Second Stage / Bachelor's Degree
2. Course Code:
015 1ت
3. Semester / Year:
Annual
4. Description Preparation Date:
2025/10/10
5. Available Attendance Forms:
Daily attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours
7. Course administrator's name (mention all, if more than one name)
Name: husham saber Qadri Email: hisham.saber.tuz@tu.edu.iq
8. Course Objectives

Course Objectives	• **Introducing students to concept of management in Isla** • **Introducing students management and the nature management** • **Identify modern trends educational administration**
9. Teaching and Learning Strategies	
Strategy	1- Cognitive objectives 1- What is the definition of bc educational administration and the nature of educatio administration? 2- What are the modern theories in sch administration? 3- What is classroom management? What are the elements of the administrative process? What are the factors affecting educational administratic 6- What is school administration and what are sch administration relationships? 2- The skills objectives the course. 1- Present with the methodological book.

	Conducting research studies by students. 3- Aski students questions related to the subject of the study.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	Introducing t student to t science	Introduction a general idea Ba definitions	Lecture a discussion method	Discussion a exchange opinions
3-4	4	educational administration Introducing t student to t nature	educational administration T nature	Lecture a discussion method	Discussion a exchange opinions
5-6	4	management a clarifying t schools a theories of t	administration a schools A administrative process theor	Lecture a discussion method	Discussion a exchange opinions
7-8	4	administrative process The stude introduces t elements of t	Elements of t administrative process T calendar and t	Lecture a discussion method	Discussion a exchange opinions
9-10	4	administrative process Introduci the student evaluation a	foundations of t calendar Administrative leadership sty Factors affecti	Lecture a discussion method	Participation and discussi They participa in presentati
11-12	4	enumerating a clarifying t foundations evaluation	educational administration School administration School	Lecture a discussion method	and discussi Participation and discussi
13-14	4	Clarifying administrative leadership sty	administration relations Mode theories in sch	Lecture a discussion method	Discussion a exchange opinions
15-16	4	Enabling t student to expla the factors affecti educational administration	administration Classroom management a the concept classroom management	Lecture a discussion method	
17-18	4	Student definiti of sch		Lecture a	Discussion a exchange opinions

19-20	4	administration Clarifying studen school administration relationships	Classroom management a the concept classroom management Mea of sch communication with the commun	discussion method Lecture a discussion method	
21-22	4	Introducing students to mode theories in sch administration		Lecture a discussion method	
23-24	4	Introducing students to mode theories in sch administration Introducing students	Parent and teach councils Sch activities, th importance, go and colou Educational supervision	Lecture a discussion style	Discussion a exchange opinions
25-26	4	classroom management a the concept classroom management	Methods educational supervision		
27-28	4	Introducing t student to t school's means communication with the commun			
29-30	4	Introducing students to t duties of pare teacher counc Introducing t student to sch activities a explaining th importance, objectives, a			
	4	colours Introduci the student to t duties of t educational supervisor Introducing t student to t methods			

		educational supervision			

11. Course Evaluation

The quarterly written exam, the oral exam, and research preparation. C- Emotional and value goals:- C1- Assigning the student to write reports according to the curriculum items. C2- Assigning students to obtain data and information related to some components of the curriculum. C3- Giving them some external questions related to the curriculum vocabulary

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Educational administration a supervision book
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Optics (Practical)
2. Course Code:
OPP012
3. Semester / Year:
Year
4. Description Preparation Date:
2025/2026
5. Available Attendance Forms:
My presence
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours/ (7) units with theory
7. Course administrator's name (mention all, if more than one name)
Name: Dheyab thaer noori Email: theyab.thair.tuz@tu.edu.iq
8. Course Objectives
The general objective of this course is to help students understand the basic concepts of optics and to acquire the skill of practical applications, conducting experiments, and knowing the nature of light, the phenomena of interference, diffraction, reflection, refraction, and polarization of light.
9. Teaching and Learning Strategies
1- Lecture method and use of interactive board 2- Explanation and clarification 3- Providing students with the basics and additional topics related to thinking outcomes 4- Directing questions to students and forming discussion groups during lectures to discuss solving thinking and analysis problems 5- Assigning students to prepare reports related to the course Applying theoretical concepts in various physical problems

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
30	60	Assigning students to prepare reports related to the course Application of theoretical concepts in various physical problems	1- Identifying the bright and dark fringes of Newton's rings using Newton's rings device 2- Refractive index of glass and water using a microscope 3- Determining the focal length of a convex lens using the graph method 4- Finding the focal length of the mirror using the graph method 5- Verifying the inverse square law in light using a photoelectric cell 6- Finding the slit width using a helium-neon laser 7- Knowing the intensity of polarized light from the analyzer and polarizer through the experiment of Malus's law 8- Finding the laser energy and power using a laser power device 9- Finding the	(In-person) Live presentation and illustrative means	Daily exams and homework to monthly and final exams.

			wavelength of mercury light using a diffraction grating 10- Finding the optical power of a sugar solution 11- Verifying Snell's law and finding the refractive index		

11. Course Evaluation

1- Practical tests

2- Theoretical tests

3- Reports and studies

4- Daily exams

5- Grades specified in weekly reports

12. Learning and Teaching Resources

Required textbooks (methodology if any)	
Main references (sources)	
Recommended supporting books and references (scientific journals, reports…)	
Electronic references, Internet sites	

Course Description Form

1. Course Name:
Optics (theoretical)
2. Course Code:
OPP012
3. Semester / Year:
Year
4. Description Preparation Date:
2025 /2026
5. Available Attendance Forms:
My presence
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hours / (7) units with practical
7. Course administrator's name (mention all, if more than one name)
Name: Dheyab thaer noori Email: theyab.thair.tuz@tu.edu.iq
8. Course Objectives
The course aims to provide the student with the basic theoretical scientific skills in the subject of physics and optics and to understand the basic principles in this field • The student can identify the nature of light • Study the phenomenon of interference in light • Study mirrors, their types, mirror geometry, and how to form the image in the mirror • Study lenses, their types, and how to create images in lenses • A study on aberration, types of aberration, and methods of reducing aberration • The student can identify the cometary aberration, astigmatism, field curvature aberration, distortion aberration, chromatic aberration and methods of reducing them. • Study interference and experiments to obtain interference, study diffraction and the mechanism of diffraction, study polarization and how polarization is produced.

9. Teaching and Learning Strategies

A- Knowledge and understanding • The student can explain the physical meaning of light • The student can explain the psychological meaning of optics • The student can explain the origin of light • The student can explain the occurrence of light • The student can mention the basic conditions for the occurrence and propagation of light	B - Subject-specific skills B1 - Identify the concepts in the subject of optics B2 - Develop skills in using means of clarification, many examples, memorization and analysis B3 - Use modern techniques in some topics (smart board and blended learning) B4 - Solve exercises from the prescribed book and from auxiliary sources

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Introducing the student to the concept of Optics and its relationship to other sciences	General introduction to the definition of optics, its applications and properties	Lecture method and use of available illustrative means to convey the idea, brainstorming and conducting experiments	Midterm and final exams Daily exams and student participation lecture discussion Preparing special assignments academic top
2	3	THE NATURE AND PROPAGATION OF LIGHT	The nature of Light , wave from and rays , Huygens principles		
3	3	THE NATURE AND PROPAGATION OF LIGHT	Index of refraction , The electromagnetic Spectrum , problems		
4	3	REFLECTION AND REFRACTION	Reflection and refraction at plane surface, the laws of reflection and refraction		
5	3	First month exam	First month exam		

6	3	REFLECTION AND REFRACTION	Ray treatment of reflection and refraction , the principle of Reversibility, Fermats principle , problems		
7	3	SPHERICAL SURFACES	Focal points and Focal lengths, Image formation, Virtual Images, conjugate points and planes		
8	3	SPHERICAL SURFACES	Convention of signs, Graphical constructions , the parallel Ray method		
9	3	SPHERICAL SURFACES	Oblique – Ray methods, Magnification , Reduced vergence, Derivation of Gaussian Formula, problems .		
10	3	LENSES	Thin lenses, focal points and focal lengths, Image Formation , Conjugates points and planes ,		
11	3	LENSES	the parallel –Ray method, The oblique-Ray method Use of lens formula, Lateral Magnifiaction , virtual Images , Lens Markers formula		
12	3	LENSES	Thin – Lens combinations, the power of a thin Lens , Derivation of the Lens Makers formula.		
13	3	LENSES	Problems		
14	3	Second month exam	Second month exam		
15	3	SPHERICAL MIRRORS	Focal point and Focal Length, Graphical coustructions,Mirror Formulas, power of Mirrors		
16	3	SPHERICAL MIRRORS	Thick mirrors, Thick – Mirror Formulas, other thick Mirrors		

17	3	A BERRIONS OF LENSES AND MIRRORS	A berrations , Spherical aberration of a lens , Spherical aberration of Mirrors		
18	3	A BERRIONS OF LENSES AND MIRRORS	coma, Astigmatism ,curvature of field , kinds of aberration .		
19	3	Third month exam	Third month exam		
20	3	OPTICAL INSTRUMENTS	The eye , Defects of vision , Spectacle , the simple microscope Magnifier , Refracting telescopes		
21	3	OPTICAL INSTRUMENTS	Normal magnification , the reflecting telescope , camera, stops, the rangefinder, problems		
22	3	INTERFERENCE	Experiment , Interference Fringes from a Double source , s principle , Young , Huygen sBiprism , Other Apparatus , , Intensity Distribution in the fringe system , Fesnel		
23	3	INTERFERENCE	Depending on Division of the wave front , Coherent sources , Division of Amplitude		
24	3	INTERFERENCE	Michelson Interferometer, Circular Fringes, visibility of Fringes, Interformetric Measurements of Length		
25	3	INTERFERENCE	Twyman and Green Interferometer , Index of Refraction by Interference Methods, Reflection from a plane – parallel film , Fringes of Equal s Rings, problems. , Inclination , Newton		

26	3	DIFFRACTION	Fresnel fraunhofer diffraction , by a single slit, Further Investigation of single – slit Diffraction pattern		
27	3	DIFFRACTION	Rectangular Aperture, Resolving power with a Rectangular Aperture, Chromatic Resolving power of a prism		
28	3	DIFFRACTION	Circular Aperture, Resolving power of a Telescope, Resoling power of a Microscope		
29	3	DIFFRACTION	The Double slit, qualitive Aspects of the pattern, Derivation of the Equation for the Intensity, Comparsion of the sigle		
30	3	Fourth month exam	Fourth month exam		

11. Course Evaluation

- Monthly and final exams
- Daily exams and student participation in lecture discussion
- Preparing special assignments on academic topics

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Fundamentals of optics ,thiro edition ,Jenkins and white
Main references (sources)	1-FUNDAMENTALS OF OPTICS FRANCIS A. JENKINS , HARVEYE WHITTE 2-OPTICS
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name: Teaching thinking
2. Course Code: t f 101
3. Semester / Year: Yearly : kharijan
4. Description Preparation Date: 19/02/2026
5. Available Attendance Forms: Official working hours
6. Number of Credit Hours (Total) / Number of Units (Total) ; 30
7. Course administrator's name (mention all, if more than one name)
Name: m . m layth shuhadah khadir Email: laytashehada@tu.edu.iq
8. Course Objectives

Course Objectives	− fahm al'asasiaat tuealim altafkir wamafhumah wabayan khasayisih wahimiatih . − bayan hamun litaelim altafkir . − fahum mueawiqat taelim altafkir , − altaearuf ealaa baed baramij altad ealaa altafkir
9. Teaching and Learning Strategies	
Strategy	#stighlal altaelim 1. al'adilat aleilmiat ealaa almashariei: yatimu tajsiduha bishakl aihtirafiin min khilal altaswit 2. aldalil aleilmiu ealaa hali almushkilati: yatimu taqdim almusaeada alfieliat lilmutatawiein biaistikhdam altiknulujia. 3. altadris aljamieiu altaeawuni: yatimu tashjie altulaab aljamieyiyin ealaa aistikhdam altiknulujia. 4. altadris al'iilikturuniu: yatimu astikhdam al'adat al'iilikturun litaqdim almuhadarat waltamarin aleamaliati.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	1	The Concept of Thinking	Unit One	Theoretical	al questions and
Second	1		Unit One	Theoretical	discussion
Third	1	Characteristics o	Unit One	Theoretical	al questions and
Fourth	1	Thinking	Unit One	Theoretical	discussion
Fifth	1	The Importance	Unit One	Theoretical	al questions and
Sixth	1	Teaching Thinkir	Unit One	Theoretical	discussion
Seventh	1	The Nature and	Unit One	Theoretical	al questions and
Eighth	1	Levels of Thinkin	Unit Two	Theoretical	discussion
Ninth	1		Unit Two	Theoretical	
Tenth	1	Factors Affecting	Unit Two	Theoretical	stions and
Eleventh	1	the Learning of	Unit Two	Theoretical	discussion
Twelfth	1	Thinking	Unit Two	Theoretical	al questions and
Thirteenth	1	Obstacles to	Unit Two	Theoretical	discussion
Fourteenth	1	Teaching Thinkir	Unit Two	Theoretical	al questions and
Fifteenth	1	Thinking Skills	Unit Two	Theoretical	discussion
Sixteenth	1	The Difference	Unit Three	Theoretical	al questions and
Seventeenth	1	Between Thinkin	Unit Three	Theoretical	discussion
Eighteenth	1	and Thinking Ski	Unit Three	Theoretical	al questions and
Nineteenth	1	Teaching Thinkir	Unit Four	Theoretical	discussion
Twentieth	1	Skills with Some	Unit Four	Theoretical	al questions and
Twenty-first	1	Applications	Unit Four	Theoretical	discussion
Twenty-second	1	Quality in Teachi	Unit Four	Theoretical	al questions and
Twenty-third	1	Thinking	Unit Four	Theoretical	discussion
Twenty-fourth	1	Lifelong Learning	Unit Four	Theoretical	al questions and
Twenty-fifth	1	Education for	Unit Four	Theoretical	discussion
Twenty-sixth	1	Sustainable	Unit Five	Theoretical	al questions
Twenty-seventh	1	Development	Unit Five	Theoretical	
Twenty-eighth	1	Thinking Styles	Unit Five	Theoretical	
Twenty-eighth	1	and Examples	Unit Five	Theoretical	
Twenty-ninth	1	The Relationsh	Unit Five	Theoretical	
Thirtieth	1	Between Thinki	Unit Five	Theoretical	
		and Intelligence	Unit six	Theoretical	
		Types of Thinkin	Unit six	Theoretical	
		Logical-Mathematical Thinking	Unit six	Theoretical	
		Central Thinking Skills	Unit six	Theoretical	
			Unit six	Theoretical	
			Unit six		
			Unit six		
			Unit six		
			Unit six		
			Unit six		
			Unit six		
			Unit six		
			Unit six		

11. Course Evaluation

- Tests and presentations (40%)
- Practical exercises and projects (30%)
- Active participation in the classroom (30%)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Learning to Think, by Assistant Professor Sabah Marshoud Manoukh Al-Obaidi Layla Ali Othman Al-Barzanji
Main references (sources)	AI related materials and visuals
Recommended books and references (scientific journals, reports…)	AI-related materials and visuals
Electronic References, Websites	Online electronic resources

Course Description Form

1. Course name:
Optional(Nanotechnology)
2. Course code:
3dcuhxms
3. Semester/Year: Annual
Annual
4. Date this description was prepared
2025–2026
5. Available attendance forms:
Daily
6. Number of study hours (total) / Number of units (total):
60 hour
7. Name of the course administrator (if more than one name is mentioned)
Name: Reham Zaid hadi Email:reham.z.hadi @tu.edu.iq
8. Course objectives

	Renewable energy: **1- Perception and understanding Principles of Renewable Energy** **2- Knowledge of renewable energy sources** **3- Knowing the types of renewable energy** **4- Knowing the main sources of non-renewable energy** **5- Knowledge of traditional energy sources** **6- Knowing the types of non-renewable energies** **Nanotechnology:** **This course aims to know the history of nanoscience and technology and the tools used. Takh Blood to deliver Yes Nanomaterials and discussion The consequences of the development missed Tribalism in the fields of science KIt's a disaster The see it growing Community development The focus will be on Khill Basic principles and knowledge to Crisis for students to understand science and technology At the nano level And YT And The decision is of interest Special for methods You And Nanomaterials.**
9. Teaching and learning strategies	
	1- Explaining the scientific material to students in detail. **2- Student participation in the work.** **3- Discussion and dialogue on vocabulary related to the topic..**
10. Course Evaluation	
	1. Daily tests With questions Multiple choice that requires scientific skills **2. Participation scores for competition questions for academic topics** **3. Grading homework** **4. Practical tests** **5. Reports and studies**

Course structure .11

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

Daily exams And homework In addition to Exams Monthly	**The blackboard What is your data?**	**Solar energy**	**Student definition of solar energy**	**2**	1
=	**=**	**Solar Energy Technologies Solar Collectors**	**Student definition With solar energy technologies Solar collectors**	**2**	2
=	**=**	**Energy uses Solar heating Water**	**Student definition The most important uses of solar energy**	**2**	3
=	**=**	**Solar cell (photovoltaic)**	**Student definition for Solar cell**	**2**	4
=	**=**	**Wind energy**	**Student definition for Wind energy**	**2**	5
=	**=**	**Hydropower**	**Student definition Hydropower**	**2**	6
=	**=**	**Other sources For energy**	**Student definition From other sources For energy**	**2**	7

=	=	**Biogas**	**)etailed explanation of my stification Vital**	**2**	8
=	=	**Diesel Vital**	**Detailed explanation of Diesel Vital**	**2**	9
=	=	**Hydrogen energy**	**Detailed explanation of Energy Hydrogen**	**2**	10
=	=	**Ways Hydrogen production**	**Introducing the student to the methods of hydrogen production**	**2**	11
=	=	**Biomass energy**	**Student definition of energy Biomass**	**2**	12
=	=	**Energy from waste**	**Introducing the student to how Energy production from waste**	**2**	13
=	=	**Cells Fuel**	**ıdent definition With fuel cells**	**2**	14
=	=	**Applications fuel cells**	**Introducing the student to applications Fuel cells**	**2**	15

		Nanotechnology concept	**Introducing the student to the concept Nanotechnology**	**2**	16

=	=	**History of Nanotechnology**	**Student introduction to history Nanotechnology**	**2**	17
=	=	**Nanotechnology Basics**	**Introducing the student to the basics Nanotechnology**	**2**	18
=	=	**Technical Excellence Principles Nano**	**Introducing the student to the principles Nanotechnology is distinguished**	**2**	19
=	=	**Material properties Nanotechnology**	**Introducing the student to the properties Nanomaterials**	**2**	20
=	=	**Material forms Nanotechnology**	**Introducing the student to the forms Nanomaterials**	**2**	21
=	=	**The importance of globalization for nanotechnology And its applications.**	**Introducing the student to the importance of Global Nanotechnology**	**2**	22
=	=	**Explanation and clarification of the most important Nanotechnology applications In physics**	**Detailed explanation of the most important applications Nanotechnology in physics**	**2**	23
		Explanation and clarification The most Important technical applications	**Introducing students to technology applications Nanotechnology in medicine**	**2**	24

		Nanotechnology in medicine			
=	=	**Explanation and clarification The most important technical applications Nano in industry**	**Introducing students to technology applications Nano in industry**	**2**	25
=	=	**The role of technology Vitality in medicine**	**Introducing students to technology applications Nanotechnology in medicine**	**2**	26
=	=	**Nanotechnology applications In the field of electronics**	**Student Definition of Nanotechnology In the field of electronics**	**2**	27
=	=	**Nanotechnology applications In pharmacy**	**Introducing students to technology applications Nano in Pharmacy**	**2**	28
=	=	**Nanoscale phenomena, nanoparticles and nanostructured materials**	**Introducing the student to phenomena and particles and nanomaterials**	**2**	29

=	=	**Nanotechnology applications: Current status and prospects the future**	**Detailed explanation of how Prepare a standard Solution of Liquid substance**	**2**	30

12. Learning and teaching resources	
Sathyaj the Mathew, 2006, “Wind Energy,” "Fundamentals, Resource Analysis and Economics", Springer, Netherlands. What is Nanotechnology (A Brief Introduction in the Form of Simplified Lessons) by Noha Alawi Habashi - 1432 - 2011 Ministry of Culture and Information in the Kingdom of Saudi Arabia Saudi Arabia	Required textbooks (methodology any)
http://www.renewableenergyworld.com/index.html	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports, etc.)

World organization Renewable energy – Related Websites and news sources http://nano.ksu.edu.sa/ar/nanotech	Electronic references, websites

Course Description Form

1. Course Name:
Thermodynamic
2. Course Code:
THP033
3. Semester / Year:
Annual
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hours / 5 unit
7. Course administrator's name (mention all, if more than one name)
Name: Prof. D. Nihad Ali Shafeek Email: nihadshafeek2026@tu.edu.iq

8. Course Objectives	
Course Objectives	1. Introducing the student to the importance of the scientific Thermodynamic for the course 2. Describing all the movements in Thermodynamic for applying them. 3. Enabling the student to rely on himself in the Electrical for applying the scientific Thermodynamic in solving all problems.

9. Teaching and Learning Strategies	
Strategy	Lecture, dialogue, discussion, and giving examples.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1)	3	**Thermodynamic**	**Thermodynamic**	Lecture and discussion	Daily exams and homework in addition to monthly exams
2)	3	Real and ideal system	System boundary	Lecture and discussion	Daily exams and homework in addition to monthly exams
3)	3	Type of equilibrium	Chemical and thermo equilibrum	Lecture and discussion	Daily exams and homework in addition to monthly exams
4)	3	Isothermal and Isobaric process	Process ther.	Lecture and discussion	Daily exams and homework in addition to monthly exams
5)	3	Celsium and kelven and Fahrenheit scales	scales	Lecture and discussion	Daily exams and homework in addition to monthly exams
6)	3	Boyle and charle and gay-lussacs laws	Laws	Lecture and discussion	Daily exams and homework in addition to monthly exams
7)	3	Exercise example	Examples	Lecture and discussion	Daily exams and homework in addition to monthly exams
8)	3	Average coefficient volume expansion	Expansions	Lecture and discussion	Daily exams and homework in addition to monthly exams
9)	3	Electromotive Force	Coils	Lecture and discussion	Daily exams and homework in addition to monthly exams
10)	3	-	First examination	-	Daily exams and homework in addition to monthly exams
11)	3	Thermodynamic work	Works	Lecture and discussion	Daily exams and homework in addition to monthly exams
12)	3	Thermodynamic work	Works	Lecture and discussion	Daily exams and homework in addition to monthly exams
13)	3	Energy U	Works	Lecture and discussion	Daily exams and homework in addition to monthly exams

14)	3	First law Ther.	Works and energy	Lecture and discussion	Daily exams and homework in addition to monthly exams
15)	3	Second law ther.	Works and energy	Lecture and discussion	Daily exams and homework in addition to monthly exams
16)	3	Thermal and type and Moller capacity	Heat capacity	Lecture and discussion	Daily exams and homework in addition to monthly exams
17)	3	Partials diffusion temperature and pressure and volume	Partials diffusion	Lecture and discussion	Daily exams and homework in addition to monthly exams
18)	3	State function for temperature and pressure and volume	State function	Lecture and discussion	Daily exams and homework in addition to monthly exams
19)	3	Types application	Applications	Lecture and discussion	Daily exams and homework in addition to monthly exams
20)	3	-	Second exam	-	Daily exams and homework in addition to monthly exams
21)	3	Kelvin for first law ther.	Laws ther.	Lecture and discussion	Daily exams and homework in addition to monthly exams
22)	3	Karno and diesel machines	Machines	Lecture and discussion	Daily exams and homework in addition to monthly exams
23)	3	Refrigerator machines	Machines	Lecture and discussion	Daily exams and homework in addition to monthly exams
24)	3	Examples solution	Examples	Lecture and discussion	Daily exams and homework in addition to monthly exams
25)	3	Entropy define	Entropy	Lecture and discussion	Daily exams and homework in addition to monthly exams
26)	3	Enthalpy define	Enthalpy	Lecture and discussion	Daily exams and homework in addition to monthly exams
27)	3	Solation examples	Example	Lecture and discussion	Daily exams and homework in addition to monthly exams

28)	3	Translator examples	Example	Lecture and discussion	Daily exams and homework in addition to monthly exams
29)	3	Statistical mechanics	Statistical	Lecture and discussion	Daily exams and homework in addition to monthly exams
30)	3	-	Third exam	Lecture and discussion	Daily exams and homework in addition to monthly exams

11. Course Evaluation

Distributing the score out of 50 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Thermodynamic
Main references (sources)	Peppers
Recommended books and references (scientific journals, reports…)	Any book that deals with the basics of Thermodynamic and its applications
Electronic References, Websites	Any website that deals with Thermodynamic

13. Curriculum Development Plan

- Familiarity with all that is new and innovative in teaching and learning strategies.
- Benefit from the latest scientific research results for applications of Electrical and magnetism in physics.
- Apply some modern teaching strategies

Course Description Form

1. Course Name:
Analytical Mechanics
2. Course Code:
AM P043
3. Semester / Year:
Annual
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hours / 6 unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Hassan Jalal Akber Email: hassan.j.akbar@tu.edu.iq

8. Course Objectives	
Course Objectives	1. Introducing the student to the importance of the scientific material for the course 2. Describing all the movements in direction and the mechanism for applying them. 3. Enabling the student to rely on himself in the mechanism for applying the scientific material in solving all problems.

9. Teaching and Learning Strategies	
Strategy	Lecture, dialogue, discussion, and giving examples.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1)	3	Introducing the student to vectors, their properties and uses	Fundamentals of vector analysis	Lecture and discussion	Daily exams and homework in addition to monthly exams
2)	3	Introducing the student to the numerical and directional multiplication of vectors and its applications	Scalar and directional product of vectors	Lecture and discussion	Daily exams and homework in addition to monthly exams
3)	3	Introducing the student to changing coordinate systems	Vector change	Lecture and discussion	Daily exams and homework in addition to monthly exams
4)	3	Introducing the student to the differentiation of vectors, velocity, and tangential and vertical acceleration	Vector differentiation	Lecture and discussion	Daily exams and homework in addition to monthly exams
5)	3	Introducing the student to the basics of motion in a straight line	Particle dynamics in linear motion	Lecture and discussion	Daily exams and homework in addition to monthly exams
6)	3	Introducing the student to the applications of linear motion	=	Lecture and discussion	Daily exams and homework in addition to monthly exams
7)	3	Introducing the student to the basics of general motion	Particle dynamics in general motion	Lecture and discussion	Daily exams and homework in addition to monthly exams

8)	3	Introducing the student to the applications of general motion and conservative force	=	Lecture and discussion	Daily exams and homework in addition to monthly exams
9)	3	Introducing the student to the motion of projectiles	Projectiles and their motion	Lecture and discussion	Daily exams and homework in addition to monthly exams
10)	3	-	First exam	-	Daily exams and homework in addition to monthly exams
11)	3	Student introduction to central forces and their applications	Central Forces	Lecture and discussion	Daily exams and homework in addition to monthly exams
12)	3	=	=	Lecture and discussion	Daily exams and homework in addition to monthly exams
13)	3	Student introduction to celestial mechanics	Celestial Mechanics	Lecture and discussion	Daily exams and homework in addition to monthly exams
14)	3	Student introduction to Kepler's Law 1	Kepler's Law 1	Lecture and discussion	Daily exams and homework in addition to monthly exams
15)	3	Student introduction to Kepler's Law 2	Kepler's Law 2	Lecture and discussion	Daily exams and homework in addition to monthly exams
16)	3	Student introduction to Kepler's Law 3	Kepler's Law 3	Lecture and discussion	Daily exams and homework in addition to monthly exams
17)	3	Student introduction to the orbit equation	Orbital Equation	Lecture and discussion	Daily exams and homework in addition to monthly exams
18)	3	Student introduction to orbit energy	Orbital Energy	Lecture and discussion	Daily exams and homework in addition to monthly exams

19)	3	Student introduction to its applications	Various Applications	Lecture and discussion	Daily exams and homework in addition to monthly exams
20)	3	-	Second exam	-	Daily exams and homework in addition to monthly exams
21)	3	Student introduction to the dynamics of a group of particles	Dynamics of a group of particles	Lecture and discussion	Daily exams and homework in addition to monthly exams
22)	3	Student introduction to the center of mass, linear and angular momentum	With center of mass, linear and angular momentum	Lecture and discussion	Daily exams and homework in addition to monthly exams
23)	3	Student introduction to potential and kinetic energy and collision	Potential and kinetic energy and collision	Lecture and discussion	Daily exams and homework in addition to monthly exams
24)	3	Student introduction to Lagrange's equations of motion	Lacrange's equations of motion	Lecture and discussion	Daily exams and homework in addition to monthly exams
25)	3	Student introduction to generalized forces	Generalized coordinates and forces	Lecture and discussion	Daily exams and homework in addition to monthly exams
26)	3	Student introduction to some applications of Lagrange's equations of motion	Various applications	Lecture and discussion	Daily exams and homework in addition to monthly exams
27)	3	Student introduction to Hamilton's	With Hamilton's equations of motion	Lecture and discussion	Daily exams and homework in addition to monthly exams

		equations of motion			
28)	3	Student introduction to some applications of Hamilton's equations of motion	Various applications	Lecture and discussion	Daily exams and homework in addition to monthly exams
29)	3	Various comprehensive applications	Various comprehensive applications	Lecture and discussion	Daily exams and homework in addition to monthly exams
30)	3	-	Third exam	Lecture and discussion	Daily exams and homework in addition to monthly exams

11. Course Evaluation

Distributing the score out of 50 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Analytical mechanics: by Dr. Grant R. Fowles Translated by Dr. Talib Nahi Al-Khafaji Year of publication 1989
Main references (sources)	Analytical mechanics BY GRANT R. FOWLES
Recommended books and references (scientific journals, reports…)	Any book that deals with the basics of analytical mechanics and its applications
Electronic References, Websites	Any website that deals with analytical mechanics

13. Curriculum Development Plan

- Familiarity with all that is new and innovative in teaching and learning strategies.
- Benefit from the latest scientific research results for applications of analytical mechanics in physics.
- Apply some modern teaching strategies

Course Description Form

1. Course Name:
Atomic Physics – Practical
2. Course Code:
ATP023
3. Semester / Year:
Annual
4. Description Preparation Date:
2025–2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 1 unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Hassan Jalal Akber **Email: hassan.j.akbar@tu.edu.iq**

8. Course Objectives	
Course Objectives	**The course aims to enable the student to: –** **1– Understand the laws of radiation** **2– Understand the definition of the visible spectrum** **3– Understand the photoelectric phenomenon** **4– Verify the inverse square law** **5– Understand the X–ray spectrum**

9. Teaching and Learning Strategies	
Strategy	Lecture method, laboratory dialogue, discussion, and giving examples.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	Finding the value of Stefan Boltzmann's constant	Stefan–Boltzmann constant law in radiation	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
3-4	4	Calculating the wavelengths of different colors	Study the visible spectrum of the hydrogen atom and find the wavelengths of the Balmer series	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
5-6	4	Calculating the Rydberg constant within the Balmer series	Determination of the Rydberg constant	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
7-8	4	-	Review of experiments and exam 1	-	Daily exams in addition to monthly exams
9-10	4	Determination of Planck's Constant	Photoelectric emission	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
11-12	4	Calculation of the grating constant by spectroscopy	Finding the diffraction grating constant using a cadmium source	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
13-14	4	Calculation of the slope of the inverse square law	Verification of the inverse square law of a light source	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
15-16	4	-	Review of experiments and exam 2	-	Daily exams in addition to monthly exams
17-18	4	Knowing the value of the charge of an oil droplet with a statement of the charge quantization	Millikan Oil - drop	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
19-20	4	Calculating the value of the charge using the Schuster method	Finding the specific charge of an electron e/m by Schuster's method	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
21-22	4	Calculating the specific charge	Determination of the specific charge	Theoretical lecture with data show	Daily exams in addition

				explanation in the lab	to monthly exams
23-24	4	Learn about X-ray spectra	X-ray spectrum	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
25-26	4	Calculating the inter-crystal distance	Finding the interatomic distance of Li, NaCl	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
27-28	4	Studying the attenuation of X-rays	X-ray absorption	Theoretical lecture with data show explanation in the lab	Daily exams in addition to monthly exams
29-30	4	-	Review of experiments and exam 3	-	Daily exams in addition to monthly exams

11. Course Evaluation

Distributing the score out of 15 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Concepts in Atomic Physics
Main references (sources)	Atomic Physics Book, Year Publication 1980
Recommended books and references (scientific journals, reports…)	-
Electronic References, Websites	General Physics Websites

13. Curriculum Development Plan

- Applying some modern teaching strategies.
- Benefiting from the latest scientific research results for atomic applications in physics.
- Using modern technology and scientific reports through explanatory videos to consolidate the scientific material in a visual manner.

Course Description Form

1. Course Name: Electronic

2. Course Code:

ELP013

3. Semester / Year :٢٠٢٥ /٢٠٢٦

4. Description Preparation Date:

5. Available Attendance Forms:

6. Number of Credit Hours (Total) / Number of Units (Total)

7. Course administrator's name (mention all, if more than one name)

Name: Robak Aziz Rasheed
Email: Rupak.A.Rasheed@tu.edu.iq

8. Course Objectives

- **The student should know the classification of materials according to their electrical properties: conductive, insulating and semiconducting**
- The student should know the scientific basis for the work and manufacture of semiconducting materials.
- The student should know the factors affecting the determination of the basic properties of semiconducting materials.
- The student should know the factors affecting the determination of any practical application based on semiconducting materials.

9. Teaching and Learning Strategies

A- Knowledge and understanding	B - Subject-specific skills
• The student can explain the physical • The student can explain the psychologi meaning of optics • The student can explain the origin of ligh • The student can explain the occurrence light • The student can mention the ba conditions for the occurrence a propagation of light	B1 - Identify the concepts in the subject of optics B2 - Develop skills in using means of clarification, many examples, memorization and analysis B3 - Use modern techniques in some topics (smart board and blended learning) B4 - Solve exercises from the prescribed bo and from auxiliary sources

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Chapter 1 1 Circuit		Lecture method and use of available illustrative means to convey the idea, brainstorming and conducting experiments	Midterm and final exams Daily exams and student participation lecture discussion Preparing special assignments academic top
2	3	Electrical 2 Electric Voltage Electric Current and Conductors			
3	3	Solved Examples Chapter 2 Introduction			
4	3	Energy Packs Crystals Conductors, Insulators and Semiconductors			
5	3	Pure Semiconductors Impurity Semiconductors			
6	3	Chapter 3 Crystalline Binary			
7	3	Binary Junction Depletion Region			
8	3	The barrier voltage is negative and			

9	3	positive in steady state			
10	3	The power diagram of the junction			
11	3	The barrier voltage calculation The junction under external influence			
12	3	Forward and reverse bias Diode circuit analysis			
13	3	Zener diode Tunnel diode Solar cell			
14	3	Commitment circuits Limiting circuits Uses of diode			
15	3	Rectification Half-wave rectification circuit			
16	3	Full-wave rectification circuit			
17	3	Rectification bridge Ripple factor Efficiency factor			
18	3	Filter circuits Voltage multiplier circuit			
19	3	Voltage regulator circuit Introduction to transistor			
20	3	Bipolar transistor			

21	3	Transistor operation Transistor currents Transistor voltages Working areas.			
22	3	Transistor Conditions of operation			
23	3	Methods of connection circuits Load line			
24	3	Field effect transistor Its structure			
25	3	How it works and its conditions Field effect transistor			
26	3	working areas Methods of connection			
27	3	circuits Load line			
28	3	Properties and parameters Transistor with problems			
29	3	Using the transistor As an amplifier and as a switch			
30	3	Self-bias circuit For field effect transistor Depletion transistor Its structure and operation Improved type			

		transistor and its structure, use and operation Metal oxi field eff transistor amplifier			

11. Course Evaluation

- Monthly and final exams
- Daily exams and student participation in lecture discussion
- Preparing special assignments on academic topics

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Electronics by Dr. Sobhi Al-Rawi
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Robak Aziz Rasheed

1. Course Name:	
Complex analysis	
2. Course Code:	
ELP013	
3. Semester / Year:	
Yearly	
4. Description Preparation Date:	
2025/10/19	
5. Available Attendance Forms:	
Weekly	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2/6	
7. Course administrator's name (mention all, if more than one name)	
Assist. Prof. Dr. Reem Imran Rasheed Email: reemamran@tu.edu.iq	
8. Course Objectives	
Course Objectives	• Studying the concept of complex numbers and their properties in the field of complex numbers • Definition of the conjugate factor and proof of the properties of absolute value • Definition of the polar formula and Euler's formula • Study of de Mouvre's theory and the roots of complex numbers • Definition of complex functions and the goal using the definition and goal at infinity • Study of continuity and the derivative and

	their applications • Definition of the Cauchy-Riemann equation, the analytical function, and the total function • Definition of anomalous and isolated points and the definition of the harmonic conjugate • Definition of the exponential function, the logarithmic function and complex exponents • Definition of trigonometric functions and hyperbolic trigonometric functions and the inverse of each of them • Complex integration (curve integration - ML inequality integration - - Cauchy's integral formulas - Cauchy's theorem courses) • Definition of sequences and geometric series and testing The ratio and the Leibniz series

9. Teaching and Learning Strategies

Strategy	• Using explanation and clarification to present concepts through discussion, analysis, and scientific thinking. • The method of comparison and criticism, asking thinking questions, and interacting with students through discussions and practical exercises during the lecture. • Using real-life examples and applications to clarify concepts. • Scientific thinking and methods of correct proof of theorems.

10. Course Structure

Week	Hours	Unit or subject name	Required Learning Outcomes	Learning method	Evaluation method
1	2	Defining a complex number		Theoretical lecture	exams and preparing assignments
2	2	And adding, subtracting, multiplying and dividing numbers		Theoretical lecture	exams and preparing assignments

3	2	Proving some properties, the root of numbers, solving quadratic equations in complex numbers		Theoretical lecture	exams and preparing assignments
4	2	Proving some properties of complex numbers, the equation of a circle in complex numbers		Theoretical lecture	exams and preparing assignments
5	2	Proving some properties of the conjugate factor in complex numbers		Theoretical lecture	exams and preparing assignments
6	2	Absolute value and applications to it		Theoretical lecture	exams and preparing assignments
7	2	Polar formula, Euler's formula		Theoretical lecture	exams and preparing assignments
8	2	De Movier's formula		Theoretical lecture	exams and preparing assignments
9	2	Powers and roots Complex numbers		Theoretical lecture	exams and preparing assignments
10	2	Complex functions		Theoretical lecture	exams and preparing assignments
11	2	The ultimate limit using the definition		Theoretical lecture	exams and preparing assignments

12	2	The convergent limit and the limit at infinity		Theoretical lecture	exams and preparing assignments
13	2	Continuity		Theoretical lecture	exams and preparing assignments
14	2	The derivative, the Cauchy-Riemann equation		Theoretical lecture	exams and preparing assignments
15	2	The Cauchy-Riemann equation in the polar form, the analytic function		Theoretical lecture	exams and preparing assignments
16	2	The total function, the anomalous point, the isolated point		Theoretical lecture	exams and preparing assignments
17	2	Harmonic functions, the harmonic conjugate		Theoretical lecture	exams and preparing assignments
18	2	Definition of the exponential function and the logarithmic function		Theoretical lecture	exams and preparing assignments
19	2	Complex exponents, functions Trigonometry		Theoretical lecture	exams and preparing assignments
20	2	inverse of trigonometric functions, derivative of the inverse of trigonometric functions		Theoretical lecture	exams and preparing assignments

21	2	hyperbolic trigonometric functions, derivative of hyperbolic trigonometric functions, inverse of hyperbolic trigonometric functions		Theoretical lecture	exams and preparing assignments
22	2	complex integration, linear integration, integration of inequalities		Theoretical lecture	exams and preparing assignments
23	2	curve integration - ML inequality integration -		Theoretical lecture	exams and preparing assignments
24	2	Cauchy's integral formulas - Cauchy's theorem (courses)		Theoretical lecture	exams and preparing assignments
25	2	definition Sequences and sequences		Theoretical lecture	exams and preparing assignments
26	2	Ratio test and Leibniz series		Theoretical lecture	exams and preparing assignments
27	2	Comparison test - Frastrass test -		Theoretical lecture	exams and preparing assignments
28	2	Power series - Tyler and McLaurin series - Lorant series		Theoretical lecture	exams and preparing assignments
29	2	- Classifying anomalous points and finding the zeros of the function - poles		Theoretical lecture	exams and preparing assignments
30	2	The residual of the function - The residual of the function using Lorant and Cauchy’s residual theorem - The residual of		Theoretical lecture	exams and preparing assignments

		the function at infinity Improper integrals - Integrals Trigonometry			

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

- Daily preparation.
- Daily exams.
- Oral and monthly exams.
- Written exams.
- Student performance in the classroom, interaction with study materials, and finding inconsistencies

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Methodical book and auxiliary books
Main references (sources)	Introduction to complex complex functions: written by Zakaria Nut
Recommended books and references (scientific journals, reports…)	Using the library and the information network to obtain some information and the student's abilities
Electronic References, Websites	Scientific encyclopedias

Course Description Form for Atomic and Molecular Material in English

1. Course Name:
Atomic and Molecular Physics
2. Course Code:
ATP023
3. Semester/ Year: Annual
2025-2026
4. Date of preparation of this description
18/2/**2024**
5. Available Attendance Forms:
Physical attendance of all students until download cases
6. Number of credit hours (total) / number of units (total):
90 hours
7. Course administrator's name (if more than one name)
Name: Esam Sameen Ali **Email:** Esam.ali@tu.edu.iq
8. Course Objectives
1- Qualifying students theoretically and practically They enable them to continue their higher studies on the one hand and play a distinguished role in research. -Qualifying students theoretically and practically and working in scientific and industrial facilities. 2- The importance of atomic physics lies in the fact that it has entered into all fields such as (X-rays, sonar, mafras, detection of cancerous tumors, magnetic resonance and others)(. 3- The student learned the most important concepts and basic principles of the theory of special and general relativity, as well as atomic models, finding the radii of orbitals, the principle of exclusion for Pauli and Hund's rule, as well as X-rays. .
9. Teaching and learning strategies
• **Is Strategy Home which Will Adopted in Introducing This one Unit in encouragement Share Students in Exercises Loyal Same time amelioration and expand Capacity And reach:** • 1- Enable students to acquire knowledge and understanding of modern physics . • 2- Enable students to acquire knowledge and understanding of private and general relativity .

- 3- Enable students to acquire knowledge and understanding of the equations of finding the radii of orbits as well as finding energy for atom planes..
- 4- Enable students to acquire knowledge and understanding of electronic distribution within the atom

10. Course Structure

The week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Enable students to know how to measure the speed of light through experiments	Introduction to the nature of light, the first experiments of measuring the speed of light, the experiment of Michaelsen and Morley	Blackboard and Data Shaw	Daily exams and homework in addition to daily exams
2	3	Enable students to know Galileo's transformations and the theory of special and general relativity	Definitions (special theory of relativity, its hypotheses, general theory of relativity, axes of attribution (inertial references), Galileo transformations.	Blackboard and Data Shaw	
3	3	Enable students to know Lawrence transforms and the reciprocal	Lawrence transforms, reciprocal Lawrence transforms, velocity	Blackboard and Data Shaw	

		of Lawrence transformations	summation		
4	3	Enable students to know and determine the relative mass, relative momentum and the relationship between energy and mass	Relativity of masses, suspended mass with energy, relative force, relative momentum, suspended between energy and momentum of a relative particle .	Blackboard and Data Shaw	
5	3	Enable students to determine mass and energy in another way	Mass and energy in other words Momentum - Energy - Mass - Force Transformations - Solved Problems	Blackboard and Data Shaw	
6	3	Enable students to know the development of the idea of the atom and atomic models	A brief history of the development of the idea of the atom, atomic models, the stability of the atom	Blackboard and Data Shaw	
7	3	Enable students to identify the Bohr model, orbital radii, and energy levels	Bohr model, finding the radii of orbits and also finding energy levels	Blackboard and Data Shaw	
8	**3**	**examination**	**examination**		

9	3	Enable students to know the deficit and defects of Bohr's theory	The deficit of Bohr's theorem, the principle of congruence or symmetry in the Bohr model, the disadvantages of this model	Blackboard and Data Shaw	
10	3	Enable students to know the electronic distribution of atoms and quantitative numbers	Electronic Configuration of the Atom, Approved Quantum Numbers, Pauli Principle and Hund Rule, Atomic Structure	Blackboard and Data Shaw	
11	3	Enable students to know the difference between the law of electrons in orbits and the law of distribution of crusts	The Law of Electron Distribution of Major Orbitals and Secondary Crusts, Atomic Spectra	Blackboard and Data Shaw	
12	3	Enable students to know the types of atomic chains and transitions	Definition of series, types of strings, atomic transitions, picking rule	Blackboard and Data Shaw	
13	3	Enable students to know electron spin, magnetic	Autoangular momentum of the electron (electron spin),	Blackboard and Data Shaw	

		moment and total angular momentum	magnetic moment of electron spin, total angular momentum, correlation reaction of twist-orbit		
14	3	Enable students to know Zeman's usual and abnormal effect	Effective magnetic field of orbital electron motion, Zeman habitual effect, Zeman anomalous effect	Blackboard and Data Shaw	
15	3	Enable students to know the working landa	Zeman's abnormal and landa-factor effect, solved issues, exercises	Blackboard and Data Shaw	
16	**3**	**Second month exam**			
17	3	Enable students to know the special duality of waves and particles	Double property of waves and particles, wave function, Dibroguli's hypothesis	Blackboard and Data Shaw	
18	3	Enable students to know the speed of the wave and the speed of the wave group	Wave velocity and wave group velocity, particle diffraction, solved problems	Blackboard and Data Shaw	
19	3	The origin of quantum	The origin of quantum theory	Blackboard and Data	

		theory, blackbody radiation and energy distribution in the spectrum of black body	- black body radiation - energy distribution in the black body spectrum - the failure of classical physics to explain energy in the black body spectrum	Shaw	
20	3	Enabling students to know and learn about Stephan's law – Planck-Boltzmann's quantum theory	Planck's quantum theory, Stefan's law, Boltzmann	Blackboard and Data Shaw	
21	3	Enable students to know and apply photoelectric effect, Compton scattering, pair production	Photoelectric effect, Compton scattering, pair output	Blackboard and Data Shaw	
22	3	Enabling students to know the physical waves, the principle of inaccuracy of Heisenberg, the principle of encounter to Bohr,	Physical waves, Heisenberg's principle of inaccuracy, Bohr's principle of convergence, solved problems	Blackboard and Data Shaw	

23	3	Enabling students to know thermal ion emission, radiation conservation and momentum, angular momentum of radiation	Thermal ion emission, radiation conservation and momentum, angular momentum of radiation, solved problems	Blackboard and Data Shaw	
24	**3**	**Third month exam**			
25	3	Enabling students to know the detection of X-rays	X-ray, X-ray detection	Blackboard and Data Shaw	
26	3	Enable students to know the measurement of X-ray intensity, X-ray diffraction	X-ray intensity measurement, X-ray diffraction	Blackboard and Data Shaw	
27	3	Enabling students to know the crystal spectrometer of X-rays	X-ray crystal spectrometry X-ray mechanics	Blackboard and Data Shaw	
28	3	Enable students to know the X-ray spectrum of the elements	X-ray spectrometry of elements, solved examples, exercises	Blackboard and Data Shaw	
29	3	Enable students to know and apply the uses	Uses of X-rays in the medical and industrial fields	Blackboard and Data Shaw	

		of X-rays in the medical and industrial fields			
30	**3**	**Fourth month exam**			

11. Course Evaluation
• **Semester and final exams.** • **Daily exams and student participation in the discussion lecture.**

12. Learning and Teaching Resources	
Required textbooks (methodology, if any)	Concepts in Atomic Physics, by Arthur Baiser – Translation : Dr. Abdel Moneim Mashkour Dr. Shaker Jaber Shaker
Main references (sources)	Physics for scientists and engineers - atomic physics - translated by Prof. Dr. Saleh Kamel Al-Bunni
Recommended books and references (scientific journals, reports...)	Modern physics –Auther – Serway , Moses , Moyer
Electronic References, Websites	**The use of sober Internet sites in collecting in the collection of some scientific lectures** Whoa, whoa, who Google books

Form Description of the course

1. Course name:	
Methods and methods of teaching	
2. Course Code:	
T 018	
3. The annual:The year/The classroom	
Annual	
4. Date of preparing this description	
18/02/2026	
5. Available attendance forms:	
A basic	
6. Number of study hours (total) / number of units (total):	
52 Hour / 30 alone	
7. (The name of the course administrator (if more than one name	
Name:MD.amir Sharif said Email:amir.sh.said@tu.edu.iq	
8. Goals	
- :The course is to make the student able to	
9. strategies Education and learning	
Cognitive objectives 1- student can indicate the meaning of science. 2- student can show the basic concepts of the curriculum. 3- student can explain the meaning of teaching methods 4- student can show the types of teaching، tegies and educational means. 5. student can indicate the modern traditional educational system and the method of developing curricula.	B- Goals المهاراتيةOf the decision. Illustrations Caption arification of sources associated with scheduled

Course structure .10

Evaluation method	Learning method	The name of the unit or subject	Learning outcomes required	Hours	The week
Preparation, daily exam, explanation, monthly exam and attendance	Cognitive objectives The -1 dent can icate the aning of .science The -2 dent can w the basic cepts of the .curriculum The -3 dent can lain the aning of teaching methods The -4 dent can ow the es of teaching, tegies and educational .means student .5 indicate modern traditional educational tem and method of	finition of -1 ence and mponents of science) characteristics, ntific thinking ls, concepts, science philosophy (teaching ic concepts -2 the curriculum (the inition of the ient and modern roach) (and ulations of logical approachوالسايكولوجي) ndations for -3 construction of the riculum (cognitive is, social basis, ogical basis, psyc (philosophical basis Curriculum -4 es (separate terial approach, vity approach, vast as), units approach, (axial approach ments of the -5 riculum / riculum as a :quadrant Educational -1 ectives (meaning of objectives education	Cognitive objectives student -1 indicate the eaning of science student -2 show the basic cepts of the .curriculum student -3 explain the aning of teaching methods student -4 show the types teaching, tegies and ducational means student can .5 icate the modern traditional cational system and the method developing .curricula Goals -Bالمهاراتية .the decision Illustrations Caption rification of rces associated with scheduled	52	26

	developing curricula.	their importance, rces of derivative cational target, els of educational vate -goals (general avior), behavioral - poses (terms and formulation), ssification for (behavioral purposes ntents and -2 earners: (Conten ncept, Educational perience, Orders of posing Methodology owledge and) (Education ool book: -3 portant, jobs,) undations,Preparatio good school book characteristics, ntific applications lysis of textbook) (content Teaching -6 and meth cational techniques aning method,) thod, strategy in ching, bases of good (teaching Teaching - thods linked to nitive imergists: ure, router) exploration, solutionThe problem Teaching - thods linked to behavioralories:			
	المهاراتGoals the decision. Illustrations Caption Clarification sources ated associ with scheduled				

		mmed progra) cation, computer (use in education Teaching - thods linked to ial exporters: Cooperative) cation, discussion, jects, educational (games ner teaching - methods: rrogation, field) (visits, reports -7 oratory and - 1 erformance practical endar: (Concept, - 2 racteristics, I, endar, calendar, cifications and racteristics of class (questions nning in -8 ching: (concept of nning and portance, types of dy plans (Annual ns, Quarterly Plans, (Plans Daily Practical -9 applications			
Assessment of the course .11					

Sources of learning and teaching .12	
he required books required (Methodology to find	
(President (sources	ussein Mohammed Abu Rayash -1 cognizing Education, Amman, Al ysra HouseFor printing and .publishing, 2006 hi Abdulrahman Marwan: Teaching -2 nking and Applications, Amman, Dar Fakr Printing and Publishing, i 3, .2007 dent work guide on strategically -3 .gerecognizing the knowled her Rabhi Alian: Engineering Optics, -4 man, Al Masra Printing and .Publishing, i 3, 2009
Books and back references are recommended (…. scientific journals, reports)	
Electronic references, Internet sites	

Course Description Form

1. Course Name: Counseling and mental health
2. Course Code: 1 Rating: 019 A S N
3. Semester / Year:yearly
4. Description Preparation Date: 2025/9/21
5. Available Attendance Forms: Basic attendance
6. Number of Credit Hours (Total) / Number of Units (Total)60hour
7.Course administrator's name (mention all, if more than one name) Name: Abdullah Salleh Mahdi Email: Abdullah.saleh.tuz@tu.edu.iq
8.Course objective.

Course Objectives: The general objective of this course is for the student to know the concept of educational guidance. For the student to know the Toliber for psychological guidance. For the student to know the characteristics on which the guidance process is based. For the student to know the personality characteristics of the psychological counselor. Course outcomes, teaching, learning and evaluation methods. The mechanism for applying the laws of physics theoretically to the scientific material and ways to understand it:	**Course specific skill objectives.** **• The traditional method of delivering the theoretical lecture.** **• Using modern technologies in some topics (smart board).** **• The possibility of presenting experiments by the student.** **• Adopting scientific thinking** **C- Emotional and value objectives** **• Directing attention to knowing psychological**

A- Cognitive objectives • 1- The student can explain the relationship of psychological guidance to other sciences. • 2- The student can explain the importance of psychological guidance and counseling. • 3- The student can explain the types of guidance (individual guidance, group guidance). • 4- The student can explain the cases of using group guidance. • 5- The student can explain the advantages of group guidance. • 6- The student can explain the disadvantages of group guidance. • 7- The student can explain the means of collecting information in guidance. • 8- The student can explain the types of interview according to the objectives of the interview. • 9- The student can explain the benefits of the interview. • 10- The student can explain the similarities between individual and group guidance	**guidance.** **• Student participation in any form of participation.** **• Giving the student a conceptual vision of the topic, arrangement or organization.** **D- General and transferable qualification skills (other skills related to employability and personal development).** **• Preparing external questions from approved sources.** **• Following up on the method of classroom discussions inside the hall.** **• Urging students to follow educatic series that are presented in video fo on official scientific links.**

1. Teaching and Learning Strategies	
Strategy	. Teaching and learning methods • Theoretical lectures covering the curriculum for the stage for 3 hours per week.

	And using various educational means. Using various teaching methods including discussion, dialogue and cooperative learning to enhance students' confidence. Explanation and direct delivery using the necessary means to convey t idea

2. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Cognitive objectives -1 The student can explain the meaning of guidance and counseling. -2 The student can explain the basis for the establishment and	-The concept of guidance and counseling - The meaning of educational counseling - The concept of counseling - The emergence and development of counseling. - The emergence and development of counseling in the modern era - Multiple factors contributed to the emergence and development of counseling	Cooperative Learning Discussion Lecture Brainstorming	Midterm and final exams Daily exa and stud participati in t lecture.
2	4	development of counseling and the factors that led to the emergence of counseling. -3 The student can explain the	- The development of the concepts of counseling and counseling - The experience of counseling and counseling in	Cooperative Learning Discussion Lecture Brainstorming	
3	4	meaning of counseling and its importance in our social, school and			

4	4	family life and its importance. -4 The student can explain the relationship between counseling and other sciences and the extent of benefit from counseling in applying other sciences such as religion, psychology and others. -5 The student can explain the foundations of psychological, social, neurological and physiological counseling B - Course specific skill objectives. Means of clarification A lot of illustrative examples Clarification of sources related to the	Iraq - - Justifications for counseling and its functions - The goals of educational counseling and its functions - The relationship between counseling and other sciences (psychology - religion - sociology - psychotherapy) - Foundations of counseling (psychological - social - philosophical - - General foundations - psychological, neurological and physiological foundations) - Fields of psychological counseling (according to the field - according to the beneficiary groups) - Counseling the	Cooperative Learning Discussion Lecture Brainstorming	
5	4			Cooperative Learning Discussion Lecture Brainstorming	
6	4			Cooperative Learning Discussion Lecture Brainstorming	
7	4			Cooperative Learning Discussion Lecture Brainstorming	
8	4			Cooperative Learning Discussion Lecture Brainstorming	
9	4			Cooperative Learning Discussion Lecture Brainstorming	

		course C- Teaching and learning methods	unusual - Methods of		
10-11	4-4		psychological counseling (individual - group), including direct and indirect	Cooperative Learning Discussion Lecture Brainstorming	
12	4		- Theories of educational counseling	Cooperative Discussion Lecture Brainstorming	
13	4		Freud's theory - theory - Psychoanalysis	Cooperative Learning Discussion	
14	4		- Theory of the self - Existential theory - Behavioral theory.	Lecture Brainstorming Cooperative Learning Discussion	
15	4		- Information needed for the counseling process - Means of collecting information	Lecture Brainstorming Cooperative Learning Discussion	
16	4		- Cumulative record - Case study - Narrative record - Autobiography	Cooperative Lecture Brainstorming	
17	4		- Tests and measures, their advantages, disadvantages and types.	Cooperative Learning Discussion Lecture	
18	4		- Educational guidance and	Brainstorming Cooperative Learning	

19-20	4-4		counseling in school - Functions of the school counselor - Educational counselor, his functions and	Discussion Lecture Brainstorming	
21	4		preparation - Guidance and	Cooperative Learning Discussion	
22	4		counseling in middle and high school - Educational guidance -	Lecture Brainstorming Cooperative Learning Discussion	
23	4		Parents and teachers councils and their role in counseling. - Mental health - Classifications of mental health	Lecture Brainstorming	
24	4		- Basic concepts related to mental health	Cooperative Learning Discussion Lecture Brainstorming	
25	4		- Characteristics of a normal and abnormal person - Standards of a normal and	Cooperative Learning Discussion Lecture Brainstorming	
26	4		abnormal personality - Self-standard, ideal standard	Cooperative Learning Discussion Lecture Brainstorming	
27-28	4-4		and social standard - Personality	Cooperative Learning Discussion Lecture	

			integration - Psychological crises - Causes of psychological crises	Brainstorming	
29	4		- Frustration - Psychological and mental disorders.	Cooperative Learning Discussion Lecture Brainstorming	
30	4		-Defense mechanism (psychological defense tricks)- Repression- Withdrawal- Regression- Fixation- Justification- Projection- Substitution -Compatibility- Meaning of compatibility- Adaption and compatibility and the relationship between them and the differences between them. - aracteristics a compatible erson-Types of ompatibility	Cooperative Learning Discussion Lecture Brainstorming	

3. Course Evaluation

To ask questions about topics that can be discussed by students in classes. Ask questions that the student solves.
For classes, make daily quick exams with intellectual questions.
General and transferable skills (other skills related to employability and personal development)
Follow up on external sources
Prepare external questions from those sources
Follow up on the method of class discussions
Urge students to follow educational series that are presented in video form on official scientific links.

the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

4. Learning and Teaching Resources

Required textbooks (curricular books, if any)	methodical book
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:

Electronics Lab

2. Course Code:

ELP013

3. Semester / Year:

Annual, 2025-2026

4. Description Preparation Date:

2026-2-17

5. Available Attendance Forms:

In-person classes

6. Number of Credit Hours (Total) / Number of Units (Total)

60 / 1

7. Course administrator's name (mention all, if more than one name)

Name: Dr. Ali Mahmoud Salman

Email: ali.mah.salman@tu.edu.iq

8. Course Objectives

Course Objectives	The course generally aims to introduce students to the fundamentals of electronic circuits, with a focus on conducting practical experiments and understanding the operating mechanisms of these circuits. The specific objectives of the course include: 1. Training students to use basic measuring instruments. 2. Enabling students to perform various practical experiments in the field of electronics. 3. Linking theoretical concepts with practical applications to enhance a deep understanding of electronics. 4. Supporting graduation projects and practical applications within the electronics specialization.

9. Teaching and Learning Strategies

Strategy	1. Lecture method 2. Dialogue and discussion 3. Brainstorming 4. Quizzes

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Commitment to safety and security rules in the electronics lab	Safety and security applications in the electronics lab	Theoretical explanation + group discussion	Oral questions and discussions
2-3	2	Identifying basic devices and their functions	Introductory overview of laboratory devices and tools	Practical demonstration of devices + theoretical explanation	Oral questions and discussions
4-5	2	Understanding how to use the oscilloscope and adjust the probe	Oscilloscope device and probe calibration	Training on the device	Observation of practical performance + short report
6-7	2	Ability to generate signals and display them on the screen	Signal generation and display using signal generator and oscilloscope	Practical experiment using signal generator and oscilloscope	Observation of practical performance + short report
8	2	Measuring voltage, current, and electronic components	Using the Digital Multimeter to measure voltage, current, and electronic components	Practical training on measurement	Practical evaluation + short questions
9	2		Test		
10-11	2	Verifying the relationship between voltage and current	Ohm's Law experiment	Practical implementation	Observation of practical performance + short report
12-13	2	Understanding the voltage-current relationship of the diode	Study of static characteristics of the crystal diode	Practical implementation	Observation of practical performance + short report
14-15	2	Identifying diode operation in half-wave rectification	Half-Wave Rectifier	Practical implementation	Observation of practical performance + short report
16-17	2	Understanding the role of the center tap in full-wave rectification	Full-Wave Rectifier using Center-Tapped Transformer	Practical implementation	Observation of practical performance + short report
20	2		Test		
21-22	2	Studying the voltage regulation property	Zener Diode Characteristics	Practical implementation	Observation of practical performance + short report

23-24	2	Understanding the role of the diode in voltage limiting	Diode Limiter Circuits	Practical implementation	Observation of practical performance + short report
25-26	2	Identifying the mechanism of voltage multiplication	Diode Voltage Multiplier	Practical implementation	Observation of practical performance + short report
27-28	2	Understanding the relationship between current and voltage in the common-emitter configuration	Transistor Common Emitter Characteristics	Practical implementation	Observation of practical performance + short report
29-30	2	Identifying transistor characteristics in the common-base configuration	Transistor Common Base Characteristics	Practical implementation	Observation of practical performance + short report

11. Course Evaluation

- **First Semester Grade**: Divided into monthly exam + daily exam + reports (7.5 marks).
- **Second Semester Grade**: Divided into monthly exam + daily exam + reports (7.5 marks).
- **Final Exam**: 15 marks.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	None
Main references (sources)	None
Recommended books and references (scientific journals, reports...)	-
Electronic References, Websites	General electronics websites

13. Curriculum Development Plan

- Updating the content and linking it to modern practical applications.
- Diversifying learning and assessment methods.

Course description form

1. Course name:	
Practical education/observation and application	
2. Course code:	
ت ط 020	
3. Semester/Year: Annual	
Annual	
4. Date this description was prepared	
18/2/2026	
5. Available forms of attendance:	
Daily attendance (morning)	
6. Number of study hours (total) / Number of units (total	
Weeks at college (10) Practical application in schools (20	
7. Name of course coordinator (if there is more than one, please state).	
Name: Dr. Amir Sharif Said Email :amir.sh.said@tu.edu.iq	
8. Course objectives	
The course aims to enable the student to: - The practical education course for fourth-year students (Physics Department) aims to qualify them professionally and educationally through actual teaching practice, linking theoretical physics knowledge with field application, developing teaching skills, and forming positive attitudes towards the teaching profession, through observation, application, classroom management, and self-evaluation. Detailed Objectives of the Physics Practical Training Course: • Developing teaching skills (professional competencies) o Mastering physics teaching methods (inquiry-based learning, discussion, active learning) and applying them in the classroom. o Acquiring lesson planning skills (preparing daily/monthly plans) and setting precise behavioral learning objectives for physics topics.	1. The student should understand the nature of teaching. 2. The student should know correct teaching methods, using successful teaching approaches. 3. The student should know modern teaching techniques, skills, methods, and strategies. 4. The student should understand its cultural foundation within society and the role of education in daily life. 5. The student should know how to apply this knowledge to serve society in the fields of education.

	o **Using teaching aids, laboratory equipment, and technology in** .Physical phenomena **explaining** o o Developing classroom management skills, organizing the learning environment, and managing time .effectively

9. **Teaching and learning strategies**

Teaching and learning strategies in physics practical education are based on a student-centered approach, shifting the teacher's role from instructor to facilitator, with the aim of fostering critical thinking and problem-solving through practical activities and laboratory experiments. Key methods include problem-based learning (PBL), scientific inquiry, cooperative learning, and computer simulation.

Key teaching strategies in physics practical education:

Inquiry-Based Learning: Students are encouraged to ask questions, design experiments, and collect data to arrive at physical concepts independently..

The laboratory and practical experimentation method: Direct application of theoretical concepts in physics laboratories, which helps in understanding complex phenomena such as electricity, magnetism, and mechanics.

Problem-Based Learning: Presenting ambiguous physics situations that require students to identify knowledge gaps, search for solutions, and apply them practically..

(Cooperative Learning) التعلم التعاوني: Dividing students into small groups to conduct experiments or projects fosters the exchange of ideas and communication skills.

Think-Pair-Share strategy: This begins with a student individually brainstorming a physics problem, then discussing it with a classmate, and finally sharing it with the class.

E-learning and simulation: Using software and virtual laboratories to demonstrate dangerous or complex experiments that are difficult to perform in real-world settings.

Brainstorming: Generating creative ideas to solve physics problems or explain natural phenomena.

.Modeling: Building tangible physics models to explain scientific principles

B. Course-Specific Skills Objectives: 1. To develop trainees' practical skills in preparing educational materials and resources. 2. To develop trainees' practical skills in preparing the classroom learning environment. 3. To develop trainees' practical skills in preparing and motivating their students for learning. 4. To develop trainees' practical skills in managing the classroom environment and maintaining classroom discipline. 5. To develop trainees' practical skills in the practical application of teaching methods and techniques necessary for their daily teaching.	أ- Cognitive Objectives -1- The student will be able to explain the meaning of science. -2- The student will be able to explain the basic concepts of the curriculum. -3- The student will be able to explain the meaning of teaching methods. -4- Trainee students will understand the meaning of practical education, its development, and its general objectives. -5- Trainee students will understand the duties and responsibilities of each trainee, as well as those of the school principal, the supervising teacher, and the educational advisor during the practical application. 6. Students will understand the duties and responsibilities of each student trainee, as well as those of the school principal, supervising teacher, and educational advisor during the training. 7. Students will develop their practical skills in preparing their daily lessons. 8. Students will develop their practical skills in formulating and using general educational objectives and behavioral objectives in teaching. 9. Students will develop their practical skills in preparing and using classroom questions.

C. Affective and Value-Based Objectives: **1. Assigning students to write reports based on the curriculum content.** **2. Assigning students to gather data and information related to some of the curriculum content.** **3. Providing them with some external questions related to the curriculum content..**	**:Teaching and learning methods** **Theoretical and practical study related to the vocabulary of practical education within the classroom, conducting field lessons to observe student performance within the classroom..** **:Assessment Methods** **Conducting student discussions, assigning students to prepare and deliver lectures within the lecture hall as a critical thinking skill, presenting mini-lessons, oral exams, preparing research papers, providing images related to the study topic, and delivering a .PowerPoint presentation** **:Oral and Written Examinations** **General and transferable skills (other skills related to employability and personal .(development** **D1- Preparing a report on their study of each developmental aspect..**

10. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
1	4	**Student definition of practical training**	Introduction to practical education	Lecture and discussion style	The method of lecturing, discussion, and exchanging opinions
2	4	**Introducing the student to observation, introducing the students to presentation, and introducing them to .micro-teaching**	Watching and casting	**Lecture and discussion style**	The method of lecturing , discussio n, and exchangi ng opinions

Short questions	**Lecture and discussion style**	Foundations for curriculum development	**Introducing students to public speaking Enables students to apply examples of different lesson plan types Enables students to become familiar with assessment items**	8	3-4-5
Participation and discussion	Students present a mini-lesson	Types of curricula	Identifying different types of teaching methods	8	6-7-8
to explain	**Students are directed to schools for practical application .purposes**	Elements of the curriculum: The curriculum as a four-part system	Educational goals, learning experiences, and school settings	8	9-10-11
Lecture and discussion style	**Students are directed to schools for practical application .purposes**	Teaching methods and educational technologies	The meaning of the method, strategic teaching methods, the foundations of good teaching, questioning, field visits, and report .writing	12	12-13-14
Lecture and discussion	Students are directed to schools for practical application purposes.	Laboratory and practical performance	Assessment and planning in teaching	12	15-16-17
They participate in the presentation and discussion	The students were directed to schools for practical application and to identify the most important problems that students faced during the .application period	Scientific applications	Practical and theoretical applications	4	18-19-20
Course evaluation .11					

ت	Evaluation methods	النسبة المئوية
1	Scientific supervisor test	30
2	Educational supervisor test	30
3	The principal's assessment of the student's discipline in school lessons	10
4	Student testing during their studies and their attendance at university lectures	30
	School principal's test and monitoring of student attendance and commitment	
5	the total	100

12. Learning and teaching resources

Required textbooks (methodology, if applicable)	
(Main References (Sources	1--كتاب التربية العملية (المشاهدة والتطبيق) ا.د.داود عبد السلام ا.د. ناز بدر خان السندي -التطبيقات التدريسية ا.د.سعد علي زاير واخرون 2- المنهج لكتب والمراجع التي يوصى بها (المجلات العلمية ،التقارير ،.....) المراجع الالكترونية ،مواقع الانترنيت 3- تخطيط المنهج وتطويره، احمد حسين اللقائي وع ابو سنينة ،عمان، 1999 4- طرائق التدريس العامة، د. توفيق احمد مر ومحمد محمود الحلية، عمان، 2006 5- تكنلوجيا التعليم بين النظرية والتطبيق ، د. م محمود الحلية، عمان، 2005 6- اساليب تدريس الدراسات الاجتماعية، د. م سكران ، عمان ، 2002 7- اصول تدريس المواد الاجتماعية، د. شاكر مح الامين واخرون ، بغداد، 2006 8- طرائق تدريس الاجتماعيات وتطبيقات علمية، ي محمد نبهان ،

	عمان، 2006
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)	

1. Course development plan:
We note that practical training is a stage of guided teaching during which students gain planned educational experiences in a specific school designated by the college of education, under the supervision and guidance of qualified personnel, whether they are faculty members from the college of education or administrators from the schools where they are training. Therefore, it is essential that student teachers become familiar with the necessary teaching theories, concepts, and skills acquired before their practical training period. This constitutes a theoretical foundation that they apply practically, enabling them to connect theory and practice within a collaborative environment in real-life classroom situations. Through this experience, they become acquainted with the characteristics of the teaching profession. An online practical training program should be developed, containing links that allow students to access the material electronically at any time.

Course Instructor
Dr. Amer Sharif Saeed

Course Description Form

1. Course Name:
Solid State Physics
2. Course Code:
SOP024
3. Semester / Year:
Annual
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
90 hours / 6 unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Hassan Jalal Akber **Email: hassan.j.akbar@tu.edu.iq**

8. Course Objectives	
Course Objectives	**1. Study some basic concepts related to solid state physics** **2. Give an introduction to solid state physics and identify the meaning of crystal, its properties and types** **3. Give an introduction to crystal dimensions and lattice parameters** **4. Address some theories related to the study of (crystal structure)** **5. Identify some theories of crystal defects and types of those defects** **6. Identify the methods of radiation interaction with matter during the process of identifying the type of bore in the diffraction system and the properties of each type and how to deal with it** **7. Address some types of crystal diffraction** **8. Identify some types of crystal lattice vibrations** **9. Explain the general methods for getting rid of crystal defects and how to treat them**

9. Teaching and Learning Strategies	
Strategy	Lecture, dialogue, discussion, and giving examples.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-6	18	Understanding the components of the crystal, theories of crystal structure, some crystal structures and types of diffraction	Chapter One / Basic Concepts in Crystal Structure	Lecture and discussion	Class questions and written exams
7	3	-	Month exam 1	Editorial	Monthly exam
8-10	9	Understanding the types of diffraction	Chapter Two / Crystal Diffraction	Lecture and discussion	Class questions and written exams
11-14	12	Understanding the different types of lattice vibrations and distinguishing between them	Chapter Three / Lattice Vibrations	Lecture and discussion	Class questions and written exams
15	3	-	Month exam 2	Editorial	Monthly exam
16-20	15	Understand the difference between theories that make up heat capacity and know the types of thermal properties	Chapter Four / Thermal Properties of Solids	Lecture and discussion	Class questions and written exams
21-24	12	Understand the methods of the applied fields of superconductivity and their types by knowing the critical temperatures of materials	Chapter Five / Crystalline Defects	Lecture and discussion	Class questions and written exams
25	3	-	Month exam 3	Editorial	Monthly exam
26-30	15	Know the difference between the types of crystal structures and defects	Chapter 6 / Superconductivity	Lecture and discussion	Class questions and written exams

11. Course Evaluation

Distributing the score out of 50 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Solid State Physics _ By Dr. Yah Nouri Al-Jamal
Main references (sources)	Solid State Physics, Mu'ayy Gabriel 1 and 2
Recommended books and references (scientific journals, reports…)	-
Electronic References, Websites	General Physics Sites

13. Curriculum Development Plan

Familiarity with everything new and innovative in teaching and learning strategies and benefiting from the latest scientific research results in materials physics. Applying some modern teaching strategies by reading solid research published in solid high-level journals, which ensures the development of the teaching ability.

Course Description Form

1. Course Name:
Nuclear Physics – Practical
2. Course Code:
NUP014
3. Semester / Year:
Annual
4. Description Preparation Date:
2025-2026
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 1 unit
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Hassan Jalal Akber **Email: hassan.j.akbar@tu.edu.iq**

8. Course Objectives	
Course Objectives	**• The student should know what are nuclear and radioactive sources** **• The student should know the risks and benefits of nuclear radiation and laboratory safety measures.** **• The student should try out methods of using radioactive sources through various experiments.** **• The student should know the meaning of terms, half-life and the amount of the mass number of isotopes of the element wax, etc.** **• The student should know the meaning of the standard and international units in use.** **• Use statistical methods and mathematical distributions such as the Gauss distribution**

9. Teaching and Learning Strategies	
Strategy	Lecture method, laboratory dialogue, discussion, and giving examples.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1-2	4	Learn about different types of radiation	Types of radiation	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
3-4	4	The effects of radiation on human health	Health effects of ionizing radiation	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
5-6	4	Methods of radiation protection	Means of protection	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
7-8	4	Knowing the units of measurement of nuclear radiation	Radiation units	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
9-10	4	-	Exam 1	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
11-12	4	Knowing the methods of safety from nuclear radiation	Radiation Safety Characteristics Curve	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
13-14	4	Components of the Geiger–Müller	Geiger–Müller Counter	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
15-16	4	The principle of operation of the meter	How to Make a Geiger–Müller Counter	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
17-18	4	Areas of operation of the Geiger–Müller	Experiment for a Geiger–Müller Counter	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
19-20	4	-	Exam 2	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams

21-22	4	Experiment to verify the inverse square law of nuclear radiation	Reducing exposure by increasing the distance with nuclear radiation	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
23-24	4	Experiment of absorption coefficient for AL	Calculating the amount of material absorbed by different thicknesses of AL	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
25-26	4	Calculation of maximum energies of beta particles	Determining a curve showing the value of the maximum energy of beta particles	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
27-28	4	scintillation counter	Components and working areas of the meter	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams
29-30	4	-	Exam 3	Theoretical lecture in the laboratory	Daily exams in addition to monthly exams

11. Course Evaluation

Distributing the score out of 15 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Nuclear Physics
Main references (sources)	Nuclear Physics Book, Radiati Protection Book, Fusion Bo Ionizing Radiation and Protecti Book, Types of Radiation Book
Recommended books and references (scientific journals, reports…)	Theses and Dissertations
Electronic References, Websites	Electronic Research

13. Curriculum Development Plan

- Familiarity with the latest in teaching and learning strategies.
- Use modern technology and scientific reports through explanatory videos to consolidate the scientific material in a visual manner.

Course Description Form

1. Course Name:
Education lab
2. Course Code:
3. Semester / Year:
Annual
4. Description Preparation Date:
2025−2026
5. Available Attendance Forms:
Inpresence
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours
7. Course administrator's name (mention all, if more than one name)
Reham Zaid Hadi Reham.z.hadi@tu.edu.iq
8. Course Objectives

Course Objectives	**Introducing students to spectra in general…. the importance of radiation and application life whether ultraviolet radiation. Ultraviolet ,infrared and raman rays a gamma raysucing student to importance light**

9. Teaching and Learning Strategies	
Strategy	1- Explain in detail the electronic spectra. 2- Explanation and interpretation of violet ,red,raman and x-ray Eplain the physics of light

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
1	3				Giving The lecture Directly and discussion
2	3			=	=
3	3			=	=
				=	=
				=	=
				=	=
				=	=
				=	=
				=	=
11. Course Evaluation					
Daily and monthly exam					
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)			Lectures are printed		
Main references (sources)			sources		
Recommended books and references (scientific journals, reports…)			Scientific journals and research		
Electronic References, Websites			Internet sites		

Course Description Form for Electromagnetic theories Course in English

1. Course Name:
Electromagnetic theories
2. Course Code:
MER46
3. Semester/ Year: Annual
2025/2026
4. Date of preparation of this description
2026/2/17
5. Available Attendance Forms:
Physical attendance of all students until download cases
6. Number of credit hours (total) / number of units (total):
75 **hours**
7. Course administrator's name (if more than one name)
Name: Robak Aziz Rasheed **Email:** Rupak.A.Rasheed@tu.edu.iq
8. Course Objectives
• **1- The student can explain the basic concepts of electrical and stable magnetism.** • **2- The student can explain the behavior of different materials electrically and magnetically.** • **3- The student can show the origin of electromagnetism.** • **4- The student can show the malleability of the materials used in electrical appliances.** • **5- The student can mention the basic conditions for the occurrence and propagation of electromagnetic waves.**
9. Teaching and learning strategies
Is Strategy Home which Will Adopted in Introducing This one Unit in encouragement Share Students in Exercises Loyal Same time amelioration and expand Capacity on solution Problems Electromagnetism And life realism, and capacity on use Math As a communication tool, ability on tying Ideas electromagnetism, and capacity on Thinking that May be Use in That is position As Critical thinking, Logically, and systematic; Be patient Objectivity And honesty and discipline mud Problems. Will be achievement That Who is it During the classes & Reports & Projects & Programs Educational Interactivity.

10. Course Structure

The week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1+2	6	Coordinates	Coordinates and their types	theoretical	Discussion questions and quizzes
3	3	Types of integration and some theories of integration transformations	Types of integration	theoretical	Discussion questions and quizzes
4+5	6	General Questions	Solving Vector Questions and Problems alif	theoretical	Discussion questions and quizzes
6+7	6	Charges and electric field	Shipment distribution and domain calculation	theoretical	Discussion questions and quizzes
8	3	Calculation of the electric field	Kaus's Law	theoretical	Discussion questions and quizzes
9	3	Differential and Integral Formulas of Kaus' Law	Kaus's Law	theoretical	Discussion questions and quizzes
10	3	Types of Shipment Distribution	Dipole Electrode	theoretical	Discussion questions and quizzes
11+12	3	Effort	Surface of the isomer	theoretical	Discussion

					questions and quizzes
13	**3**	**calculate the domain of a point charge in a fluid,**	**Dot charge in a fluid**	**theoretical**	**Discussion questions and quizzes**
14	**3**	**Moving from one medium to another**	**Boundary conditions of field and displacement**	**theoretical**	**Discussion questions and quizzes**
15	**3**	**examination**	**examination**	**theoretical**	**Discussion questions and quizzes**
17+16	**6**	**Understand the continuity equation,**	**Continuity equation**	**theoretical**	**Discussion questions and quizzes**
18	**6**	**Introduction to Maxwell's equation**	**Maxwell's equation**	**theoretical**	**Discussion questions and quizzes**
19	**3**	**Applications**	**Applications of Maxwell's equations**	**theoretical**	**Discussion questions and quizzes**
18	**3**	**Differentiation of the wave equation**	**Wave equation**	**theoretical**	**Discussion questions and quizzes**
19	**3**	**The Vector of BioNTG and its**	**Boyntang vector**	**theoretical**	**Discussion questions**

		applications			**and quizzes**
20	**3**	**Magnetic field**	**Constant current magnetic field**	**theoretical**	**Discussion questions and quizzes**
21+22	**6**	**Derivation and applications of the laws of Piot and Safart**	**Piot and Safart Laws**	**theoretical**	**Discussion questions and quizzes**
23	**3**	**The concept of magnetism and magnetization**	**Magnetism and magnetization**	**theoretical**	**Discussion questions and quizzes**
24	**3**	**Derivation of the Law of Wave Velocity**	**Electromagnetic wave speed**	**theoretical**	**Discussion questions and quizzes**
25	**3**	**examination**	**examination**	**theoretical**	**End of Second Semester Exam**

11. Course Evaluation

- **Semester and final exams.**
- **Daily exams and student participation in the discussion lecture.**

12. Learning and Teaching Resources

Required textbooks (methodology, if any)	**Fundamentals of Theory Electromagnetic Theory - by Ritz Milford**
Main references (sources)	**Electromagnetism by BB Loud**
Recommended books and references (scientific journals, reports...)	• Electromagnetic Field Theory Engeneering • ElectromagnetismW.H. Hight, Jr, McGraw-Hill, 2001
Electronic References, Websites	**The use of sober Internet sites in collecting in the collection of some scientific lectures**

Course Description Form

1. Course Name:
Laser
2. Course Code:
LAP044
3. Semester / Year:
Year
4. Description Preparation Date:
2025 /2026
5. Available Attendance Forms:
My presence
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours
7. Course administrator's name (mention all, if more than one name)
Name:Dheyab thaer noori Email: theyab.thair.tuz@tu.edu.iq
8. Course Objectives
• The course aims to provide the student with basic theoretical scientific skills in laser physics and to understand the basic principles in this field • Learn about laser properties and types of lasers，Clear scientific knowledge in the field of laser and its applications
9. Teaching and Learning Strategies

A- Knowledge and understanding A1-Learn the basic skills in laser material A2- Lecture method A3- Practical application A4- Evaluation examinations A5- Developing the student through	B - Subject-specific skills B1 - Identify the concepts in laser physics B2 - Developing skills in using means of clarification, abundance of examples, memorization, and analysis B3 - Using modern technologies in some subjects (smart board and blended

self- and continuous education by studying the properties of the laser, its types and benefits	learning)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introducing the student to the concept of lasers and their relationship to other sciences	A general introduction to the definition of lasers, their applications and characteristics	(In attendance) Live delivery And the means Illustrations	Daily exams And homework In addition Exams Monthly and final
2	2	Basic principles	The concept of light, the theory of light, the development of the theory Light, electromagnetic spectrum, discovery Laser		
3	2	Radiation interaction with matter	Black body radiation theory, absorption, Spontaneous emission, stimulated emission, rates Emission and absorption		
4	2	Radiation interaction with matter	Einstein's calculations of translational coefficients, Section Transverse transmission and absorption, and gain coefficient		
5	2	Radiation	Permitted and permitted		

		interaction with matter	transitions, spectral line broadening processes, level occupation at thermal equilibrium		
6	2	First month exam	First month exam		
7	2	Laser theory	Theoretical calculations of the ratio of stimulated to spontaneous emission and of different bands of the electromagnetic spectrum Spectral line broadening processes		
8	2	Laser theory	Homogeneous and heterogeneous exposure, occupancy of levels at thermal equilibrium		
9	2	Census inversion and threshold condition	The idea of the maser and laser, the basics of laser operation, count inversion, threshold condition, gain factor at threshold limit		
10	2	Pumping methods in lasers	Pumping techniques in laser devices and pumping plans, triple and quadruple		
11	2	Pumping methods in lasers	Rate equations for pumping schemes, critical pumping, overall pumping efficiency, laser beam characteristics		
12	2	Resonator in laser devices	Classification of resonators in terms of (stability or geometric shape), Fabry-Perot input,		

			stability condition		
13	2	Vibration patterns	Resonator patterns, theoretical calculations of laser spot size, and wave front radius of curvature.		
14	2	Second month exam	Second month exam		
15	2	Adjust the quality factor and lock the pattern.	Quality control factor, quality control techniques (rotating mirror, electro-optical technology {Pockel cell - Kerr cell}, audio-optical technology)		
16	2	Adjust the quality factor and lock the pattern.	Giant Pulse, Giant Pulse Power, Giant Pulse Laser Uses, Pattern Fixation		
17	2	Types of lasers	Solid State Lasers: Sapphire, Nd:YAG, Nd:Glass.		
18	2	Types of lasers	Gas lasers: Helium-neon, argon ion, carbon dioxide, excimer		
19	2	Types of lasers	Liquid state lasers: R6G dye laser. Semiconductor lasers: Gallium arsenide		
20		Application period	Application period		
21		Application period	Application period		
22		Application period	Application period		
23		Application period	Application period		

24		Application period	Application period		
25		Application period	Application period		
26	2	Uses of lasers	In physics and chemistry, life sciences, medicine, industry		
27	2	Laser Applications	in optical communications, in measurement and inspection, in military uses, in stereoscopic photography.		
28	2	Laser Applications	Medical, Optical Communications, Measurements and Inspection, Stereography, Isotope Separation		
29	2	Third month Exam	Third month exam		
30	2	Safety and Security in Laser Laboratories	Penetrance and absorption to the eye, Effect on the body, Threshold levels, Eye protection		

11. Course Evaluation

- Semester and final exams
- Daily exams and student participation in the lecture discussion
- Preparing special assignments on academic topics

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Laser physics and some practical applications, written by Dr. Siham Afif

	Qandala Lasers, written by Bella A. Linkel, translated by Farouk Aboudi Kassir
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Title:
Measurement and evaluation
2. Course Code:
018 qt
3. Semester / Year:
annual
4. The date of preparation of this description is the beginning of the school year
٢٠٢٥-٢٠٢٦
5. Available Forms of Attendance:
Came
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours
7. Course administrator's name (if more than one name)
Name: Najah M. Werdee Email: najah.m.werdee@tu.edu.iq
8. Course Objectives
1- **Know the basic concepts (test, measurement, evaluation). –Distinguish between various types of tests.** 2- **Know the characteristics of pedagogical measurement. – Distinguish between the characteristics of educational measurement and physical measurement.** 3- **The types of calendar are defined by the time of the procedure.** 4- **Recognize the relationship between educational objectives and the educational evaluation process.** 5- **Know the types of achievement tests** 6- **The qualities of a good test (honesty, consistency, ease of application and correction, comprehensiveness, objectivity, standards) define its concept, types, factors affecting it.** 7- **Define behavioral goals and their classifications.** 8- **Know the test experience and the steps of conducting it .** 9- **Calculate the coefficient of difficulty, ease, wrong alternatives and judge paragraphs.**

10-**Tests based on answer choice (true and false tests, conformity tests) are defined.**	
9. Teaching and Learning Strategies	
- **Defines the concepts of the following basic terms: measurement, evaluation, collection, testing** **- Determines the areas of educational evaluation (and the elements of each) teacher, student, curriculum, school.** **- Determine the benefits of the purposes of educational evaluation for each of the student, teacher, family, educational or school administration** **- Knowledge of school evaluation tools [tests, questionnaire, observation** **- Statement of the relationship of achievement tests with educational objectives .**	Cognitive Objectiv
- **Create an atmosphere of desire to think or form mental habits** **- Create an environment that encourages the learner to desire to provok thoughtful thinking and thought-provoking behavior patterns**	Emotional goals and value.
- Use educational discussion (educational dialogue), which depends on the exchange of ideas to reach the facts. **- The use of modern scientific techniques (slide projector (over head).** **- The collective memorandum to involve all students in the classroom activity.** **- Classroom exercises to participate in finding appropriate solutions for some aspects of evaluation.**	**Teaching and learning methods**
- **General and qualifying skills transferred (other skills related to employability and personal development).** **- Encourage students to deal with different educational materials in the light of appropriate technical and technical skills.** **- Developing students' abilities to analyze educational content to identify thinking skills and problem-solving skills .** **- Developing students' abilities to design presentations of thinking skills .** **- The ability to evaluate the processes presented to students.**	**Evaluation method**

10. Course Structure

Evaluation method	Method of education	Unit or subject name	Required Learning Outcomes	Hours	The week

Oral	**Discussion**	**Meeting with students and giving educational guidance Give them the vocabulary of the material**	**Meeting with students and giving educational guidance Give them the vocabulary of the material**	**1-2**	**1**
Oral	**Discussion**	**Returning general information about the measurement and evaluation material An overview of measurement and evaluation, including a brief history and the concepts of testing, measurement and evaluation and their importance in the educational process**	**Returning general information about the measurement and evaluation material An overview of measurement and evaluation, including a brief history and the concepts of testing, measurement and evaluation and their importance in the educational process**	**1-2**	**2**
Oral	**Discussion**	**What do we measure types of measurement, characteristics or nature of psychological and educational measurement**	**The main steps of learning assessment Definition of measurement**	**1-2**	**3**
Oral	**Discussion**	**Definition of test and evaluation The difference between test and evaluation and the relationship between them**	**Testing and evaluation The difference between testing and evaluation**	**1-2**	**4**

Oral	**Commissions and applications at the end of each stage.**	**The purpose for which pedagogical psychometrics is used**	**The importance of measurement and evaluation in the educational process**	**1-2**	**5**
Oral	**Commissions and applications at the end of each stage.**	**Formative primer Diagnostic**	**Types of calendar by time**	**1-2**	**6**
Oral	**Commissions and applications at the end of each stage.**	**Spoken Tests Reference Benchmark Tests Reference**	**Types of evaluation according to the interpretation of the results of the achievement test**	**1-2**	**7**
editorial	**First Semester Exam**		**First Semester Exam**	**1-2**	**8**
Oral	**Commissions and applications at the end of each stage.**	**Determining educational educational objectives Determining the content (specification table)**	**Building achievement tests**	**1-2**	**9**
Oral	**Commissions and applications at the end of each stage.**	**Analysis of the content of the course and the number of hours scheduled for teaching**	**Building achievement tests**	**1-2**	**10**
Oral	**Commissions and applications at the end of each stage.**	**The general purpose of building achievement tests from the preparation of the teacher**	**Continuation of the previous lecture**	**1-2**	**11**

Oral	**Commissions and applications at the end of each stage.**	**Oral tests - their disadvantages - methods of improvement - written tests**	**Types of achievement tests**	**1-2**	**12**
Oral	**Commissions and applications at the end of each stage.**	**Advantages of the essay test Conditions for preparing essay questions - disadvantages - methods of correcting them**	**Types of essay tests**	**1-2**	**13**
Oral	**Commissions and applications at the end of each stage.**	**Essay tests Objective tests have their advantages and disadvantages**	**Tests used in evaluating academic achievement**	**1-2**	**14**
Oral	**- Assignments, applications and discussions with students.**	**Its advantages and disadvantages Paired conformity tests Conditions for their preparation**	**The rules on which it is based in the design of true and false tests**	**1-2**	**15**
Oral	**Commissions and applications at the end of each stage.**	**Multiple tests with their advantages, disadvantages and rules of preparation**	**Types of objective tests**	**1-2**	**16**
Oral	**Commissions and applications at the end of each stage**	**Observation, its tools and types, advantages and disadvantages**	**Test methods**	**1-2**	**17**
editorial		**Second Semester Exam**	**Second Semester Exam**	**1-2**	**18**
11. Course Evaluation					
Daily exam and monthly exam					

12. Infrastructure	
1- Required textbooks	
- Psychometrics and educational evaluation.Authored by A.d.Safaa Tariq Habib. **-Psychometrics . Written by Safwat Farag.** **-Psychometrics. Written by Saad Abdel Rahman.** **- Measurement and evaluation . d.Sabah Hussein Al-Ajili et al.**	2- References and sources
-Journal of Psychometrics and Educational Evaluation **Journal of Educational and Psychological Measurement)** **-Statistical programs for data analysis such a SPSS, Rascall**	**A- Recommended books and references (scientific journals, reports, ...)**
Internet Sites ...	**Electronic References**
	13. Course Development Plan
- Holding workshops related to measurement and evaluation **- Benefiting from research and conference recommendations regarding measurement and evaluation** **- Keeping abreast of developments in the field of measurement and evaluation**	

Course Description Form

1. Quantum Mechanics :Course Name
2. :Course Code QUP034
3. Annual / Semester
Annual
4. Date of Preparation of this Description
2026−2025
5. Available attendance forms: In person
In person
6. :Number of study hours (total) / number of units (total)
7 Hour 75/ 7 units
7. Course in charge name (Asst. Lect.Abdullah Zaham Nouri)
Name: Asst. Lect.. Abdullah Zaham Nouri :Email abdullah.zahem.tuz@tu.edu.iq
8. Course Objectives

	1- Study the concept of physical foundations for mechanics quantum 2- Learn The student the most important The basic concepts and principles of the wave function and the concept of particles and waves and solutions of equations Schrödinger for all particles As well as identifying nuclear interactions and radiation

9. Teaching and learning strategies	
Empowering students to gain knowledge and understandi of solving the equation Schrödinger for the harmonic oscillator and learning Knowledge-recall skills and knowledge Analysis skills	Empowering students to gain knowledge and understanding of quantum physics Empowering students to gain knowledge and understanding of the wave function and its properties Empowering students to gain knowledge and understanding of the equation Dunker Time-dependent and time-independent

10.

Evaluation method	Learning method	Unit or topic name			Week

Course Structure 10					
Evaluation method	Teaching method	Unit / course or topic name	Required learning outcomes	Hours	Week
Exams and homework preparation	Theoretical lecture	Physical foundations for mechanics quantum	Applying the course objectives	3	1
=	=	Effects, properties of effects	Applying the course objectives	3	2
=	=	Equation Schrödinger Time-dependent	=	3	3
=	=	Equation Schrödinger Time-independent	=	3	4
		Principles of quantum and solving the equation Schrödinger	=	3	5
		Applications of the equation Schrödinger	=	3	6
=	=	Month exam First	=	3	7
=	=	Eigenvalue and eigenfunction Operator Hermitian	=	3	8
==	=	Orthogonality and orthogonal functions	=	3	9

=	=	Expected value variance with Examples	=	3	10
=	=	Theory Ehrenfest First And the second		3	11
=	=	Degradation with Examples	=	3	12
=	=	Symmetry Cam states	=	3	13
=	=	Calculating wave functions for the harmonic oscillator	=	3	15
=	=	Second month exam	=	3	16
==	=	Modified harmonic oscillator	=	3	17
=	=	Solving the equation Schrödinger for the free body	=	3	18
=	=	Applications of the equation Schrödinger In one dimension	=	3	19
		Application period	Application period	Applicati on period	20
		Application period	Application period	Application period	21
		Application period	Application period	Application period	22
		Application period	Application period	Application period	23
		Application period	Application period	Application period	24
		Application period	Application period	Application period	25
		Application period	Application period	Application period	26
=	=	A free particle inside the box, density of	Applying course objectives	3	27

		states, step potential shape			
=	=	Penetrating the voltage barrier andmetLinear harmonic oscillator and the generating function	=	3	28
=	=	Hydrogen atom	=	3	29
==	=	Hydrogen atom	=	3	30

11. Course evaluation

Conducting semester exams
Counter Duties||
Final exams

12. Learning and teaching resources

Textbook, methodological, and supporting books	Required textbooks (if any)
Quantum mechanics by Dr. Abd Al-Salam Abd Al-Amir and Dr Jassem Muhammad	Main references (sources)
Using the library and information network to obtain some information and student capabilities	Supporting books and references recommended (scientific journals, (….reports
Scientific encyclopedias	Electronic references, internet sites

Course Description Form

1.Course Name:

Nuclear

2.Course Code:

NUP014

3.Semester / Year:

2025/2026

4.Description Preparation Date:

2026/2/ 18

5.Available Attendance Forms:

In-person lectures according to the official schedule of the Physics Department / Fourth Stage, as well as exams, according to the instructions within the department in the college.

6.Number of Credit Hours (Total) / Number of Units (Total)

75 h

7.Course administrator's name (mention all, if more than one name)

Name: Esam Sameen Ali
Email: esam.ali@tu.edu.iq

8. Course Objectives

Course Objectives

Learn about the meaning of the nucleus, its basic properties, and how to classify it into types according to its mass and atomic numbers.

Know the nuclear structure and nuclear models that played a role in explaining the stability of nuclei and calculating binding and separation energies and how to determine the most stable nuclei for different isobaric nuclei.

Learn about the types of nuclear radiation, the characteristics of each type, its risks, and how to deal with it.

Determine the type of nuclear reaction appropriate for each type of nuclear radiation by identifying the cross section of the reaction and the stopping power.

9. Teaching and Learning Strategies

Preparing specialists in general physics and its practical applications, who are responsible for studying the country's need for development and progress and are able to meet the needs of the labor market in state institutions and industrial sectors.

Preparing an educated generation armed with science and relying on scientific knowledge and the scientific method as a basis for modern radical changes and putting thinking, analysis and adaptation to

Technology development in order to keep pace with the expansion of human needs.

Effective contribution to deepening and strengthening the university's relationship with society through implementing consulting work, training and developing teaching and administrative cadres.

Serving the preparation of graduates specialized in physics who contribute to serving development in the country.

10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
3+2+1	9	Knowing some basic concepts about the nucleus	1- The fixed properties of the nucleus such as: mass, charge, size of the nucleus, and the kinetic properties of the nucleus. 2- Definitions (isotopes, isobars, isomers, isotones) The property of symmetry	Theoretical	Tests and Questions
6+5+4	9	Learn about the nuclear structure	1 Binding energy -2 Binding energy ratio -3 Calculation of separation energies -4 Stability and abundance line Natural	Theoretical	Tests and Questions
9+8+7	9	Nuclear models	1 Liquid drop model (Update) Add questions about determining the most stable isobars -2 Nuclear shell model -3 Other nuclear models	Theoretical	Tests and Questions
12+11+10	9	Understand the meaning of radioactivity and patterns of nuclear decay.	-1 Phenomenon of radioactivity and effectiveness -2 Methods of production of radioisotopes -3 Radioactive equilibrium -4 Patterns of decay (alpha, beta, and gamma) (Update): Calculation of the mixing ratio Transitions of rays	Theoretical	Tests and Questions
15+14+13	9	Knowing the methods of interaction of nuclear	-1 Stopping power -2 Range -3 Interaction of charged and non-	Theoretical	Tests and Questions

		radiation with matter	charged particles and gamma rays with matter. -4 Shielding from nuclear radiation and the materials used for each type of radiation.		
18+17+16	9	Nuclear reactions	-1 Types of nuclear reactions -2 Cross-sectional area and its types -3 Nuclear fission and fusion reactions	Theoretical	Tests and Questions
21+20+19	9	Learn about nuclear energy production from reactors	Nuclear reactors Fission -1 The working principle of the reactor -2 The reactor part	Theoretical	Tests and Questions
24+23+22	9	Identify the types of radiation doses resulting from exposure to radiation.	1- Types of radiation doses -2- Risk factor (Update) - Methods of protection from radiation -A- Protection from external exposure -B- Protection from internal exposure -3- Recommendations regarding limits -and periods of exposure for workers -in the field of radiation.	Theoretical	Tests and Questions
25	3	Learn about elementary particles	Introduction to elementary particle physics	Theoretical	Tests and Questions

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