

Academic program description form

University name: Tikrit University

College/Institute: College of Education for Pure Sciences

Scientific Department: Department of Physics

Name of academic or professional program: Bachelor's degree

Name of final degree: Bachelor of Physics

Academic system: annual

Description preparation date: The beginning of the 2025-2026 academic year

Date of filling the file: 23/12/2025

Signature:

Name of Department Head:

Prof. Dr. Mohsen Hassan Ali

Date: 23 / 12/2025

Signature:

Name of Scientific Assistant:

Prof. Dr. Muhammad Ahmed Jassim

Date: 23 / 12/2025



أ.د. محمد أحمد جاسم
معاون العميد للشؤون العلمية
كلية التربية للعلوم الصرفة

Check the file by:

Quality Assurance and Performance Evaluation Division

Name of the Director of the Quality Assurance and Performance Evaluation Division:

Dr. Safa Khalil Ibrahim

Date: 23/12/2025

the signature

Professor Doctor
Ali Abdul Majeed Shihab
College of Education
for Pure Sciences

23-12-2025

Authentication of the Dean

1. see the program

Improvement of academic performance in this wide variety of is demanded by an accelerated pace of scientific and technological progress. Higher education bodies strive to have modern laboratories, cutting-edge technology, and excellent academic facilities to provide services to faculty and students alike. Programs of this nature focus on young students' development of scientific skills early on in their education by emphasizing research, creativity, innovation, and entrepreneurship. As it stands, this framework is concerned with translating theoretical knowledge into practical outcomes that contribute to scientific advancement and social progress. It urges students on research activities that lead students to pursue innovation and knowledge utilization through economic value and technological advancements.

2. Program message

The program seeks to graduate competent students equipped with strong analytical thinking and research capabilities in physics. It provides students with up-to-date scientific knowledge and modern technologies that support effective learning and skill development across different fields. The department promotes scientific inquiry and intellectual interaction to enable students to engage with contemporary scientific developments and cultural progress worldwide. By responding to the evolving needs of society, the program contributes to sustainable development and supports national, regional, and global scientific competitiveness. Through collaboration between universities, research centers, and industrial sectors, the program facilitates the practical application of knowledge and the transformation of scientific research into real innovations. It also aims to prepare future leaders in education and research by creating an academic environment that encourages scientific excellence and continuous skill development.

3. Program objective

1. Preparing highly qualified graduates capable of serving in educational.
2. Providing students with strong academic foundations that support employment opportunities in various professional fields.
3. Developing students' teaching and educational skills to prepare them for academic careers.
4. Encouraging students to expand and apply their knowledge in their future professional paths.
5. Qualifying outstanding graduates to pursue postgraduate studies (Master's and PhD) in specialized areas of physics.

4. Program Structure

Program Structure	Number of Courses	Study Unit	Percentage	Notice
Enterprise requirements	5	12	7%	Essential
College requirements	12	50	29%	Essential
Department requirements	21	110	64%	Essential
Summer training				
Other				

5. Expected learning outcome of the programmer

Knowledge

Cognitive Goals	<ol style="list-style-type: none"> 1. Enabling students to acknowledge the significance of studying physics and its role in scientific and technological progress. 2. Introducing students to the historical contributions of Arab scientists to the development of physics and scientific knowledge. 3. Assisting students in overcoming academic challenges that may affect their progress in physics studies. 4. Developing students' ability to formulate clear cognitive and behavioral objectives that can be observed and evaluated. 5. Increasing students' awareness of the role of classroom activities in improving learning and applying knowledge in educational environments. 6. Demonstrating the influence of scientific knowledge in physics on intellectual development and analytical thinking..
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Skills

General and qualifying skill goals	<ol style="list-style-type: none"> 1. Familiarizing students with modern instructional approaches and contemporary teaching techniques. 2. Encouraging continuous learning in physics in order to keep pace with rapid scientific and technological developments in the discipline. 3. Motivating students to participate in scientific events such as conferences, seminars, and academic workshops.
The program's skill objectives	<ol style="list-style-type: none"> 1. Developing the ability to effectively teach physics concepts in educational settings. 2. Enabling students to apply experimental techniques and laboratory practices confidently and accurately. 3. Strengthening students' capacity to analyze relationships between causes and results when solving scientific problems.

Values

Educational values	<p>Promoting continuous development, innovation, and improvement in educational practices.</p> <p>Encouraging adherence to quality standards and striving for excellence in the educational process.</p>
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6. Teaching and Learning strategies

1. teaching approach.
2. based instruction.
3. laboratory activities and experiments.
4. Interactive discussions and academic dialogue.
5. Flipped learning techniques that encourage active student participation.

7. Evaluation methods

1. Regular weekly assignments and reports.
2. Practical examinations and laboratory assessments.
3. Periodic tests conducted weekly, monthly, and annually.
4. Graduation research project evaluation.
5. Educational and scientific field visits.

8. Faculty

Faculty members

Preparing the Teaching staff		Requirements/Skills (if any)	Specialization		name	Scientific rank
Lecturer	permanent		Private	General		
	✓		Nano Electronics	Physics sciences	Nadeem Khaled Hassan	Prof
	✓		Nuclear	Physics sciences	Asmaa Ahmed Aziz	Prof
	✓		Solid/Solid	Physics	Abdullah	Prof

				sciences	Mahmoud Ali	
	✓		Solid	Physics sciences	Niran Fadel Abdul-Jabbar's	Prof
	✓		Solid	Physics sciences	Ayed Najm Saleh	Assist. Prof
	✓		solid/materials	Physics sciences	Muammar Abdulaziz Kamel	Assist. Prof
	✓		Solid	Physics sciences	Hanan Reda Abdel Ali	Assist. Prof
	✓		Nanotechnology	Physics sciences	Qahtan Novan Abdullah	Assist. Prof
	✓		Solid	Physics sciences	Walaa Mahfouz Muhammad Amin	Assist. Prof
	✓		Solid	Physics sciences	Rasha Hamed Ahmed	Assist. Prof
	✓		Lasers and molecular spectra	Physics sciences	Qasim Hammadi Mahmoud	Assist. Prof
	✓		Solid	Physics sciences	Ibrahim Khalaf Salman	Assist. Prof
	✓		Solid	Physics sciences	Kukab Dawoad Salim	Assist. Prof
	✓		Solid	Physics sciences	Abbas Kasoub Jarallah	Teacher
	✓		Atomic Physics	Physics sciences	Mohsen Hasan Ali	Prof
	✓		Solid	Physics sciences	Hassan Hamada Ali	Teacher
	✓		Methods of teaching physics	Physics sciences	Ahmed Talab Sabar	Teacher
	✓		Solid	Physics sciences	Shahad Ahmed Dhiab	Teacher
	✓		Solid	Physics sciences	Khaled Majoul	Teacher

					Turkish	
	✓		Solid	Physics sciences	Ali Hussein Muhammad	Teacher
	✓		Solid	Physics sciences	Omar Adel Jadaan	Teacher
	✓		Solid	Physics sciences	Safa Khalil Ibrahim	Teacher
	✓		Solid	Physics sciences	Amna Raad Dahham	Assist. Teacher
	✓		Nuclear	Physics sciences	Hafsa Taha Ahmed	Assist. Teacher
	✓		Solid	Physics sciences	Alia Muhammad Alwan	Assist. Teacher
	✓		English	Physics sciences	Roula Fawaz Hammad	Assist. Teacher
	✓		Solid	Physics sciences	Mustafa Wathiq Fathi	Teacher
	✓		Nuclear	Physics sciences	Rafid Sami Hamid	Assist. Teacher

Professional development

Orienting new Faculty members

Structured and routine faculty orientation activities, which familiarize new faculty members (visiting lecturers and permanent staff), are a part of the academic environment. Through this experience, they are shown the teaching strategies being put into practice by the experienced instructors in the department. This orientation entails ongoing mentoring and supervision, with an intent to develop their teaching skills as well as to improve their capacity to teach course content effectively. As another positive, new faculty are also encouraged to enroll in departmental and institutional training schemes aimed at enhancing their knowledge of a given subject and pedagogical ability.

Professional development for Faculty members

Continuing education is a priority for its staff. Workshops, seminars, research activities, and educational courses can also be incorporated into the plan to develop pedagogical and research skills. Teaching should lead to the use of innovative teaching practices such as collaborative, problem-based and discussion-based approaches to teaching. These days, modern teaching approaches, such as brainstorming, group learning and discovery-based techniques, are being emphasized. Through evaluation of professional development and structured questionnaires to test the impact, the effectiveness of these programs is judged by departmental and student feedback. It is ensured through the university quality assurance unit, inter alia, that such appraisals are carried out in conjunction with departmental evaluations, in order to continue the progression of the academic program.

9. Acceptance criterion

(Central admission)

10. The most important sources of information about the program

Ministry of High education and Scientific research

11. Program development plan

Several measures are established to assess and enhance the academic program on a regular basis. Establishing special committees within the department to oversee and monitor the implementation of the academic program and to periodically assess program status. Seeking student feedback via questionnaires at the end of each semester on students' experiences of the academic curriculum. Collecting feedback from faculty about curriculum development and teaching practice. Collaborating with the university's quality assurance department to oversee and improve the academic program. Conducting thorough program reviews to identify areas for improvement and ensure alignment with modern educational standards.

Program Skills Chart

Learning outcomes required from the program

Values				Skills				Knowledge				Essential or optional	Name course	Course code	Year/level
C4	C3	C2	C1	B4	B3	B2	B1	A4	A3	A2	A1				
*	*	*	*		*	*	*	*	*	*	*	Essential	Electric and magnetic	ELP021	First year
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Heat and properties of matter	THP041	
*	*	*	*		*	*	*	*	*	*	*	Essential	mathematics	MAP031	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Mechanics	MEP011	
*		*	*	*	*	*	*	*	*	*	*	Essential	Arabic	Ar 017	
*	*	*		*	*	*	*	*	*	*	*	Essential	Computer	C 016	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Educational psychology	Psy 017	
*		*	*		*	*	*	*	*	*	*	Essential	Foundations of education	F 016	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Human rights and democracy	Hr 013	
	*	*	*		*	*	*	*	*	*	*	Essential	English language	EL 442	

* Please check the boxes corresponding to the individual learning outcomes from the program being assessed

Program Skills Chart

Learning outcomes required from the program

Values				Skills				Knowledge				Essential or optional	Name course	Course code	Year /level
C4	C3	C2	C1	B4	B3	B2	B1	A4	A3	A2	A1				
*	*	*	*		*	*	*	*	*	*	*	Essential	Electric and magnetic	ELP032	2nd / year
*	*	*	*		*	*	*	*	*	*	*	Essential	Optics	OPP012	
*	*	*	*		*	*	*	*	*	*	*	Essential	Mathematics	MAP022	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Sound and wave motion	WMP042	
*		*	*		*	*	*	*	*	*	*	Essential	astronomy	SSP052	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	psychology	Psy 017	

*	*	*	*	*	*	*	*	*	*	*	*	Essential	Curricula and textbooks	Cu T015	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Educational administration	Ed 015	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	English language	EL 443	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Arabic language	Ar 018	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	The crimes of the Baath regime		

Program Skills Chart															
Learning outcomes required from the program															
Values				Skills				Knowledge				Essential or optional	Name course	Course code	Year/level
C4	C3	C2	C1	B4	B3	B2	B1	A4	A3	A2	A1				
*	*	*	*		*	*	*	*	*	*	*	Essential	Electronics	ELP013	3 rd /year
*	*	*	*		*	*	*	*	*	*	*	Essential	Thermodynamics	THP033	
*	*	*	*		*	*	*	*	*	*	*	Essential	Atomic and molecular	ATP023	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Analytical mechanics	AMP043	
*	*	*	*		*	*	*	*	*	*	*	Essential	Teaching methods	Tm 018	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Counseling and mental health	Cm 019	
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Complex function		
*	*	*	*	*	*	*	*	*	*	*	*	Essential	Selection		

Program Skills Chart															
Learning outcomes required from the program															
Values				Skills				Knowledge				Essential or optional	Name course	Course code	Year/level
C4	C3	C2	C1	B4	B3	B2	B1	A4	A3	A2	A1				
	*	*	*		*	*	*	*	*	*	*	Essential	Solid state	SOP024	4 th /year
*	*	*	*		*	*	*	*	*	*	*	Essential	Nuclear	NUP014	
*	*	*	*		*	*	*	*	*	*	*	Essential	Quantum physics	QUP034	
*	*	*	*		*	*	*	*	*	*	*	Essential	Laser	LAP044	

		*	*	*	*	*	*	*	*	*	*	Essential	Electromagnetic theories	EMR46
*	*	*	*		*	*	*	*	*	*	*	Essential	View and apply	Va 019
*	*	*	*		*	*	*	*	*	*	*	Essential	Measurement and evaluation	Me 018

Course description form

1-Course Name					
Mechanics / First Stage					
2 -Course Code					
MEP011					
3-Semester / Year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5-Available forms of attendance					
Daily					
6- Number of study hours (total) / Number of units (total)					
60 hours					
7- Name of the course supervisor (if more than one name is mentioned)					
Assistant Professor Dr.muaamar A.kamil muaamar.a.kamil@tu.edu.iq					
8 -Course objectives					
Objectives of the study subject			<ul style="list-style-type: none"> Identify the types of motion. Study the motion of projectiles, falling objects and planets. Study the types and direction of forces. Study the types of torques applied to objects. Study the effect of terrestrial and linear acceleration on the motion of objects. Motion of fluids. Waves and wave motion 		
9- Teaching and learning strategies					
Lecture style, discussing with students, and asking and exchanging questions with students			Strategy		
10 -Course structure					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	3	Physical	Basic concepts	Lecture	Daily and

		quantities			monthly exams, assignments and reporting
Second	3	International System of Units	Basic concepts	Lecture	Daily and monthly exams, assignments and reporting
Third	3	Arithmetic operations on vectors	How to deal with directional quantities	Lecture	Daily and monthly exams, assignments and reporting
Fourth	3	Finding the unit matrix and mathematical operations	Getting to know matrices	Lecture	Daily and monthly exams, assignments and reporting
Fifth	3	equations of motion	Recognizing regular motion	Lecture	Daily and monthly exams, assignments and reporting
Sixth	3	Rotational motion equations	Recognizing rotational motion	Lecture	Daily and monthly exams, assignments and reporting
Seventh	3	Instantaneous and instantaneous velocity equations	Find out the instantaneous speed	Lecture	Daily and monthly exams, assignments and reporting
Eighth	3	Motion in a straight line	Movement	Lecture	Daily and monthly exams, assignments and reporting
Ninth	3	Rotational motion	Movement	Lecture	Daily and monthly exams, assignments and reporting
Tenth	3	free fall	One-way movement	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	3	Projectiles	Movement in a plane	Lecture	Daily and monthly exams, assignments and reporting
Twelfth	3	Relative velocity	Movement in a plane	Lecture	Daily and monthly exams, assignments and reporting
Thirteenth	3	Newton's first law	Moving objects	Lecture	Daily and monthly exams, assignments and reporting

Fourteenth	3	Newton's second law	Moving objects	Lecture	Daily and monthly exams, assignments and reporting
Fifteenth	3	Newton's third law	Moving objects	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	3	Static and static friction	Legitimate friction	Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	3	Constant force work	Work and energy	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	3	variable power work	Work and energy	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	3	Restoring force and spring constant calculation	Work and energy	Lecture	Daily and monthly exams, assignments and reporting
Twentieth	3	Center of mass of a particle and two point particles	Motion of a system of particles	Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	3	Principle of conservation of linear momentum	Motion of a system of particles	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	3	Elastic and inelastic collision	Collisions	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	3	Collisions in the Rutherford plane and scattering	Collisions	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	3	angular velocity	Rotational motion	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	3	The relationship between rotational and translational motion	Rotational motion	Lecture	Daily and monthly exams, assignments and reporting

Twenty-Six	3	Simple vibrational motion equations	Vibrational motion	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	3	Flexibility and density	Liquids	Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	3	Pressure and Archimedes' Principle	Liquids	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	3	Wave motion	Waves	Lecture	Daily and monthly exams, assignments and reporting
Thirty ¹	3	Thermal equilibrium and its equations	the heat	Lecture	Daily and monthly exams, assignments and reporting

11-Course Evaluation

Daily exams score: 5, Homework and reports score: 10, Monthly exams score: 35

Final exam score: 50

12-Learning and teaching resources

Required textbooks (methodology if available)	Mechanics for primary grades
Main References (Sources)	muhammad Qaysarun Mirza / 200
Recommended supporting books and references (scientific journals, reports...	References and reports on the web page

Course description form

1- Course name					
Electric/first class					
2- Course code /					
ATP023					
3- Semester / year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5- Available attendance forms					
Day					
6- Number of study hours (total) / number of units (total)					
90 hour					
7- Name of the course administrator (if more than one name is mentioned)					
Name:- Assist. Prof. Dr:- Hanan Ridha , Email:- dr.hanan.ridha@tu.edu.iq					
8- Course objectives					
Objectives of the study subject		Study the charge and material The meaning of the law of the electric field Causs law The meaning of electric potential The law of capacitance The insulates and its properties The properties of current and resistance			
9- Teaching and learning strategies					
Strategy		Lecture style, discussing with students, and asking and exchanging questions with students			
10- Course Structure					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learnin g method	Evaluatio n method
First	3	Basic concepts	Structural material	Lecture	Daily and monthly exams, assignments and reporting
Second	3	Basic concepts	The charge and material	Lecture	Daily and monthly exams, assignments and

					reporting
Third	3	The know kind of the charge	Charge	Lecture	Daily and monthly exams, assignments and reporting
Fourth	3	The know of the kind of material	Semiconductors,conductors and insoulater	Lecture	Daily and monthly exams, assignments and reporting
Fifth	3	The know of the regular movment	The movment equations	Lecture	Daily and monthly exams, assignments and reporting
Sixth	3	Coulums law	Coulums law	Lecture	Daily and monthly exams, assignments and reporting
Seventh	3	Know of the units of the mesurments	Charge,current	Lecture	Daily and monthly exams, assignments and reporting
Eighth	3	The electric field	Electric field	Lecture	Daily and monthly exams, assignments and reporting
Ninth	3	Electric field intensity	Electric field intensity	Lecture	Daily and monthly exams, assignments and reporting
Tenth	3	Point charge	Point charge	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	3	Continuos surface	Continuos surface	Lecture	Daily and monthly exams, assignments

					and reporting
Twelfth	3	The solution of the excersice	Excersice solution	Lecture	Daily and monthly exams, assignments and reporting
Thirteenth	3	Capacetances	Capacetances	Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	3	kind of the capacitance	Kind of the capacitance	Lecture	Daily and monthly exams, assignments and reporting
Fifteenth	3	Double panel of capacitance	Double panel of capacitance	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	3	Spherical capacitance	Spherical capacitance	Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	3	Cylindrical capacitance	Cylindrical capacitance	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	3	System partical movment	System partical movment	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	3	the factors effecting on the capacitance	Factors effect on the capacitance	Lecture	Daily and monthly exams, assignments and reporting
Twentieth	3	Connecting of the capacitance	Connecting of the capacitance	Lecture	Daily and monthly exams,

					assignments and reporting
Twenty-one	3	Electrical energy	Electrical energy	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	3	insulators	Insulators	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	3	Properties of the current and the resistance	Properties of the current and resistance	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	3	potential	potential	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	3	Oums law	Oums law	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Six	3	Dc current	Dc current	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	3	Learn about molecular physics and molecular bonds	molecular physics and molecular bonds	Lecture	Daily and monthly exams, assignments and reporting
Thirty¹	3	Knowledge of molecular spectra	molecular spectra	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	The basics of the electric and magnetic
Main references (sources)	No
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	General physics websites

Course description form

1- Course name	
Heat and properties of Matter / First stage	
2- Course code /	
THP041	
3- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
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:- Assist. Prof. Dr:- Rasha Hamid Ahmed , Email:- rashahamed@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	1- Learn about the laws of thermodynamics and how to use them. 2- Adding the laws of heat and heat conversions to solving problems and linking them to daily life 3- Developing thinking to understand states of matter and how to transform matter from one state to another 4- Ability to solve energy and work problems 5- Obtaining knowledge to determine the

mechanical properties of materials, which enables students to understand the environment that surrounds them as well as deal with society.

6- Understanding the magnetic properties of materials and being able to benefit from them when dealing with materials in nature

9- Teaching and learning strategies

Strategy

Lecture style, discussing with students, and asking and exchanging questions with students

10- Course Structure

Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	2	Ch.1 / Temperature	The temperature -1 scales Types of -2 thermometers.	Lecture	Daily and monthly exams, assignments and reporting
Second	2	Ch.1 / Temperature	Effect of -3 temperature changes. Thermal -4 expansion. Mechanism of -5 heat transfer	Lecture	Daily and monthly exams, assignments and reporting
Third	2	Ch.1 / Temperature	Low -6 temperatures Temperature -7 gradient	Lecture	Daily and monthly exams, assignments and reporting
Fourth	2	Ch.2 / Heat and Phase Changes	Heat and its -1 effects Quantity of heat -2	Lecture	Daily and monthly exams, assignments and reporting

Fifth	2	Ch.2 / Heat and Phase Changes	Quantity of heat -3 Temperature -4 Specific of heat -5 materials	Lecture	Daily and monthly exams, assignments and reporting
Sixth	2	Ch.2 / Heat and Phase Changes	The Specific of -6 heat materials measurement The mechanical -7 equivalent of heat Potential energy -8	Lecture	Daily and monthly exams, assignments and reporting
Seventh	2	Ch.2 / Heat and Phase Changes	The state -9 transformation The first law of -10 thermodynamics Application of -11 first law	Lecture	Daily and monthly exams, assignments and reporting
Eighth	2	Ch.3 / The Gases	The ideal and -1 real gases The kinetic -2 theory of gases	Lecture	Daily and monthly exams, assignments and reporting
Ninth	2	Ch.3 / The Gases	The gas law -3 Boyls law -4 Charles law -5 The gas constant -6	Lecture	Daily and monthly exams, assignments and reporting
Tenth	2	Ch.3 / The Gases	The Potential -7 energy of gas Relation -8 between Cp and Cv	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	2	Ch.4 / The Liquids	The density -1 The pressure of -2 liquids	Lecture	Daily and monthly exams, assignments and reporting

Twelfth	2	Ch.4 / The Liquids	The surface tension -3 The liquid surface -4	Lecture	Daily and monthly exams, assignments and reporting
Thirteenth	2	Ch.4 / The Liquids	The capillarity -5 The viscosity -6 -7	Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	2	Ch.5 / The Mechanical Properties of Materials	Stress -1 Strain -2	Lecture	Daily and monthly exams, assignments and reporting
Fifteenth	2	Ch.5 / The Mechanical Properties of Materials	Elasticity -3 Modulus of Elasticity -4	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	2	Ch.5 / The Mechanical Properties of Materials	Youngs Modulus -5 Poissons ratio -6	Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	2	Ch.5 / The Mechanical Properties of Materials	Torsional constant -7 Torsional Strain -8	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	2	Ch.6 / The Magnetic Properties of Materials	The magnetic moment of electron -1 The angular momentum of electron -2	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	2	Ch.6 / The Magnetic Properties of	The relation between (M) and (L) -3	Lecture	Daily and monthly exams,

		Materials	The magnetic susceptibility -4		assignments and reporting
Twentieth	2	Ch.6 / The Magnetic Properties of Materials	Classification of magnetic materials -5 The diamagnetic materials -6 The paramagnetic materials -7 The ferromagnetic materials -8 The anti-ferromagnetic materials -9 The ferrimagnetic materials -10	Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	2	Ch.6 / The Magnetic Properties of Materials	The magnetic elements -11 Magnetic transition metals -12 Magnetic rare earth metals -13	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	2	Ch.7 / The Electrical Properties of Materials	The conductors -1 The Semiconductors -2 The insulators -3	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	2	Ch.7 / The Electrical Properties of Materials	Electrical resistivity -4 The superconductivity -5	Lecture	Daily and monthly exams, assignments and reporting

Twenty-Four	2	Ch.7 / The Electrical Properties of Materials	Electric field -6 Capacitor -7	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	2	Ch.7 / The Electrical Properties of Materials	Polarization -8 Dielectric -9 constant	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Six	2	Ch.7 / The Electrical Properties of Materials	Dielectric -10 constant and Refractive index Electrical -11 breakdown	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	2	Ch.8 / The Plasma	The Plasma -1 Plasma -2 Production	Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	2	Ch.8 / The Plasma	Investigation of -3 Plasma Plasma and -4 magnetic field	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	2	Ch.8 / The Plasma	Confinement of -5 Plasma	Lecture	Daily and monthly exams, assignments and reporting
Thirty	2	Ch.8 / The Plasma	The Earth -6 magnetic field and the solar Plasma	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 10, score for assignments and reports: 10, score for monthly exams: 30

Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Heat and properties of Matter / Dr. Kadhim Ahmed Mohammed
Main references (sources)	Materials Science/ Maty Naser
Recommended supporting books and references (scientific journals, reports...)	University Physics/ Raheem abd
Electronic references, Internet sites	https://www.alfred-library.com

Course description form

1- Course name	
Principles of education / First Year	
2- Course code /	
PE 016	
3- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
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:- Teacher:- Ahmed Taleb Sabar , Email:- ahmed.s.m.o.j@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	<ul style="list-style-type: none">- Define education.- Define Islamic-Arabic education.- Recognize education in some ancient civilizations.- Understand primitive education.
9- Teaching and learning strategies	
Strategy	<ul style="list-style-type: none">- Lectures, student discussions, and question exchange.

10. Course Structure:					
Week	Hours	Learning Outcomes	Unit/Topic	Teaching Method	Assessment Method
1	2	Understanding, Analyzing, Synthesizing	Historical overview of education	Lecture, Discussion	Daily and monthly exams, assignments
2	2	Understanding, Analyzing, Synthesizing	Educational objectives	Lecture, Discussion	Daily and monthly exams, assignments
3	2	Understanding, Analyzing, Synthesizing	Primitive education	Lecture, Discussion	Daily and monthly exams, assignments
4	2	Understanding, Analyzing, Synthesizing	Features of primitive education	Lecture	Daily and monthly exams, assignments
5	2	Understanding, Analyzing, Synthesizing	Education in ancient Mesopotamia	Lecture, Discussion	Daily and monthly exams, assignments
6	2	Understanding, Analyzing, Synthesizing	Chinese education	Lecture, Discussion	Daily and monthly exams, assignments
7	2	Understanding, Analyzing, Synthesizing	Education system in Sparta	Lecture, Discussion	Daily and monthly exams, assignments
8	2	Understanding, Analyzing, Synthesizing	Athenian education	Lecture, Discussion	Daily and monthly exams, assignments
9	2	Understanding, Analyzing, Synthesizing	Greek education	Lecture, Discussion	Daily and monthly exams, assignments
10	2	Understanding, Analyzing, Synthesizing	Islamic-Arabic education	Lecture, Discussion	Daily and monthly exams, assignments
11	2	Understanding, Analyzing, Synthesizing	Stages of Islamic-Arabic education	Lecture, Discussion	Daily and monthly exams, assignments
12	2	Understanding, Analyzing, Synthesizing	Pre-Islamic education era	Lecture, Discussion	Daily and monthly exams,

					assignments
13	2	Understanding, Analyzing, Synthesizing	The era of Islam's emergence	Lecture, Discussion	Daily and monthly exams, assignments
14	2	Understanding, Analyzing, Synthesizing	Righteous Caliphs and Umayyad eras	Lecture, Discussion	Daily and monthly exams, assignments
15	2	Understanding, Analyzing, Synthesizing	Era of development and prosperity	Lecture, Discussion	Daily and monthly exams, assignments
16	2	Understanding, Analyzing, Synthesizing	Era of decline and dissolution	Lecture, Discussion	Daily and monthly exams, assignments
17	2	Understanding, Analyzing, Synthesizing	Prominent figures in Islamic- Arabic educational thought	Lecture, Discussion	Daily and monthly exams, assignments
18	2	Understanding, Analyzing, Synthesizing	Ibn Khaldun	Lecture, Discussion	Daily and monthly exams, assignments
19	2	Understanding, Analyzing, Synthesizing	Ibn Sina	Lecture, Discussion	Daily and monthly exams, assignments
20	2	Understanding, Analyzing, Synthesizing	Al-Ghazali	Lecture, Discussion	Daily and monthly exams, assignments
21	2	Understanding, Analyzing, Synthesizing	Western educational figures	Lecture, Discussion	Daily and monthly exams, assignments
22	2	Understanding, Analyzing, Synthesizing	Plato	Lecture, Discussion	Daily and monthly exams, assignments
23	2	Understanding, Analyzing, Synthesizing	Jean-Jacques Rousseau	Lecture, Discussion	Daily and monthly exams, assignments
24	2	Understanding, Analyzing, Synthesizing	Pestalozzi	Lecture, Discussion	Daily and monthly exams, assignments
25	2	Understanding, Analyzing, Synthesizing	John Dewey	Lecture, Discussion	Daily and monthly exams,

					assignments
26	2	Understanding, Analyzing, Synthesizing	Al-Ghazali	Lecture, Discussion	Daily and monthly exams, assignments
27	2	Understanding, Analyzing, Synthesizing	Relationship between education and society	Lecture, Discussion	Daily and monthly exams, assignments
28	2	Understanding, Analyzing, Synthesizing	Relationship between education and the environment	Lecture, Discussion	Daily and monthly exams, assignments
29	2	Understanding, Analyzing, Synthesizing	Moral education	Lecture, Discussion	Daily and monthly exams, assignments
30	2	Understanding, Analyzing, Synthesizing	Education and economic development	Lecture, Discussion	Daily and monthly exams, assignments

11- Course Evaluation

- Monthly exam score: 50
- Final exam score: 50

12- learning and Teaching Resources

- Required textbooks (if applicable):

Foundations of Education for early grades.

Main references (sources)

Al-Ibrashi, Mohammed Atiyah, *Jean-Jacques Rousseau: His Views on Education and Teaching*. Cairo: Dar Ihyaa Al-Kutub Al-Arabiya, 1951.

Course description form

1- Course name	
Computer / First Year	
2- Course code /	
C 016	
3- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
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:- Dr:- Hasan Hamada Ali , Email:- hasan.hamada.ali@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	<ul style="list-style-type: none">• Understanding the basic components of a computer.• Understanding the different types of computers and their parts.• Understanding the concept of an electronic password, important phone files, viruses, and their types that harm a computer.• Learning how to use a computer.
9- Teaching and learning strategies	
Strategy	- Lectures, student discussions, and question exchange.

10. Course Structure:

Week	Hours	Learning Outcomes	Unit/Topic	Teaching Method	Assessment Method
1	1	Understanding, Analyzing, Synthesizing	Introducing the student to the stages of computer development	Lecture, Discussion	Daily and monthly exams, assignments
2	1	Understanding, Analyzing, Synthesizing	Familiarizing the student with the fields of computer use	Lecture, Discussion	Daily and monthly exams, assignments
3	1	Understanding, Analyzing, Synthesizing	Introducing the student to the components of a computer	Lecture, Discussion	Daily and monthly exams, assignments
4	1	Understanding, Analyzing, Synthesizing	Familiarizing the student with the types and classifications of computers Introducing the student to the software	Lecture	Daily and monthly exams, assignments
5	1	Understanding, Analyzing, Synthesizing	framework and number	Lecture, Discussion	Daily and monthly exams, assignments
6	1	Understanding, Analyzing, Synthesizing	systems used in computer	Lecture, Discussion	Daily and monthly exams, assignments
7	1	Understanding, Analyzing, Synthesizing	Familiarizing the student with the main parts of a computer	Lecture, Discussion	Daily and monthly exams, assignments
8	1	Understanding, Analyzing, Synthesizing	Understanding the central processing unit (CPU) and its components	Lecture, Discussion	Daily and monthly exams, assignments
9	1	Understanding, Analyzing, Synthesizing	Understanding input and output devices	Lecture, Discussion	Daily and monthly exams, assignments
10	1	Understanding, Analyzing, Synthesizing	Understanding memory and its types Understanding the mouse, its components, and its functions	Lecture, Discussion	Daily and monthly exams, assignments
11	1	Understanding, Analyzing,	The student will learn	Lecture, Discussion	Daily and monthly

		Synthesizing	about programming languages, their levels, and the most important systems that computers use.		exams, assignments
12	1	Understanding, Analyzing, Synthesizing	Monthly exam	Lecture, Discussion	Daily and monthly exams, assignments
13	1	Understanding, Analyzing, Synthesizing	The student will learn about the computer platform.	Lecture, Discussion	Daily and monthly exams, assignments
14	1	Understanding, Analyzing, Synthesizing	The student will learn about the computer platform.	Lecture, Discussion	Daily and monthly exams, assignments
15	1	Understanding, Analyzing, Synthesizing	The student will learn about the most important components of the system unit.	Lecture, Discussion	Daily and monthly exams, assignments
16	1	Understanding, Analyzing, Synthesizing	The student will learn about the operating system and its most important functions. Computer security and hacking	Lecture, Discussion	Daily and monthly exams, assignments
17	1	Understanding, Analyzing, Synthesizing	The student will learn about the digital world and the types	Lecture, Discussion	Daily and monthly exams, assignments

			of violations that occur within it.		
18	1	Understanding, Analyzing, Synthesizing	The student will learn about malware and viruses and their types.	Lecture, Discussion	Daily and monthly exams, assignments
19	1	Understanding, Analyzing, Synthesizing	The student will learn about methods of protecting the computer from the damage caused by hacking.	Lecture, Discussion	Daily and monthly exams, assignments
20	1	Understanding, Analyzing, Synthesizing	The most important damages and consequences of using the computer for long periods.	Lecture, Discussion	Daily and monthly exams, assignments
21	1	Understanding, Analyzing, Synthesizing	Introducing the student to the objectives, functions, components, and types of operating systems.	Lecture, Discussion	Daily and monthly exams, assignments
22	1	Understanding, Analyzing, Synthesizing	Understanding the components and properties of the desktop.	Lecture, Discussion	Daily and monthly exams, assignments
23	1	Understanding, Analyzing, Synthesizing	Understanding the most important file-related commands.	Lecture, Discussion	Daily and monthly exams, assignments
24	1	Understanding, Analyzing, Synthesizing	Understanding how to search for files	Lecture, Discussion	Daily and monthly exams,

					assignments
25	1	Understanding, Analyzing, Synthesizing	Learning copy, cut, and paste commands.	Lecture, Discussion	Daily and monthly exams, assignments
26	1	Understanding, Analyzing, Synthesizing	Understanding how to scan files and use antivirus software.	Lecture, Discussion	Daily and monthly exams, assignments
27	1	Understanding, Analyzing, Synthesizing	Understanding how to create shortcuts to files.	Lecture, Discussion	Daily and monthly exams, assignments
28	1	Understanding, Analyzing, Synthesizing	Learning how to change the language, time zone, and date.	Lecture, Discussion	Daily and monthly exams, assignments
29	1	Understanding, Analyzing, Synthesizing	Understanding the properties of the desktop.	Lecture, Discussion	Daily and monthly exams, assignments
30	1	Understanding, Analyzing, Synthesizing	Understanding the properties of the taskbar.	Lecture, Discussion	Daily and monthly exams, assignments

11- Course Evaluation

- Monthly exam score: 50
- Final exam score: 50

12- learning and Teaching Resources

- Required textbooks (if applicable):

The Ministry of Higher Education's Textbook, Parts 1 and 2 - For the First Stage
Yusr Al-Mustafa Science Series: "Computer and Internet Fundamentals, Office 2010" by Dr. Ziad Muhammad Aboud, 2013

Main references (sources)

Windows 7 Operating System, Microsoft Corporation, Official Website:
www.microsoft.com

Course description form

1. Course Name:					
English Language / First Stage					
2. Course Code:					
EL 442					
3. Semester / Year:					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5. Available Attendance Forms:					
Daily					
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: Assist. Teacher: Rola Fawwaz Hammad Email: rula.f.hammad@tu.edu.iq					
8. Course Objectives					
Course Objectives			<ul style="list-style-type: none"> • learning the basics of English language <input type="checkbox"/> studying some tenses <input type="checkbox"/> studying some English styles • studying some physical terms 		
9. Teaching and Learning Strategies					
Strategy		Lecture style, discussing with students, and asking questions to students			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	1	Learn what is the basics of English Language	Basics of English	Lecture	Quiz
Second	1	How and when this tense is used	Present continuous tense	Lecture	Monthly exam

Third	1	Training for reading	Reading	Lecture	Daily listening
Fourth	1	How and when this tense is used	Simple present tense	Lecture	Monthly& daily exam
Fifth	1	How this style is used	Zero conditional (If clause)	Lecture	Monthly& daily exam
Sixth	1	How to use this style	Future passive	Lecture	Monthly& daily exam
Seventh	1	How to use this style	Present passive	Lecture	Monthly& daily exam
Eighth	1		First exam	Lecture	Monthly exam
Ninth	1	Knowing some physical terms	Terms	Lecture	Quiz
Tenth	1	Training for Speaking	Speaking	Lecture	Daily participants
Eleventh	1	Training for reading	Reading	Lecture	Daily participants
Twelfth	1	How to read decimal numbers	Reading decimals	Lecture	Monthly& daily exam
Thirteenth	1	How to read years	Reading years	Lecture	Monthly& daily exam
Fourteenth	1	Knowing the time	Telling the time	Lecture	Monthly& daily exam
Fifteenth	1	How to use this type of Answer	Short Answer	Lecture	Monthly& daily exam
Sixteenth	1	-----	Second exam	Lecture	Monthly exam

Seventeenth	1	Training for writing	Story time	Lecture	Monthly& daily exam
Eighteenth	1	Knowing some definitions	Definitions	Lecture	Monthly& daily exam
Nineteenth	1	How to use this style	Comparative	Lecture	Monthly& daily exam
Twentieth	1	How to use this style	Superlative	Lecture	Monthly& daily exam
Twenty first	1	Training for Reading	Reading	Lecture	Monthly& daily exam
Twenty second	1	-----	Third Exam	Lecture	Monthly exam
Twenty third	1	Knowing the Meaning of some terms	Physical terms	Lecture	Monthly& daily exam
Twenty fourth	1	Reinforcement students' knowledge of vocabulary	Vocabulary	Lecture	Monthly& daily exam
Twenty fifth	1	Reinforcement students' knowledge	Synonyms	Lecture	Monthly& daily exam
Twenty sixth	1	Reinforcement students' knowledge	Antonyms	Lecture	Monthly& daily exam
Twenty seventh	1	Reinforcement students' knowledge	Matching	Lecture	Monthly& daily exam

Twenty eighth	1	Knowing some English styles of communication	Introduction	Lecture	Monthly& daily exam
Twenty ninth	1	-----	Review	Lecture	-----
Thirtieth	1	Students' Evaluation	Fourth Exam	Lecture	Monthly exam

Course description form

1- Course name					
Mathematics					
2- Course code					
MAP031					
3- Semester / year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5- Available attendance forms					
Weekly					
6- Number of study hours (total) / number of units (total)					
90 hour					
7- Name of the course administrator (if more than one name is mentioned)					
Name:- Dr. Haider Sawadi					
8- Course objectives					
Objectives of the study subject			<ul style="list-style-type: none"> Providing information to the student about the most important mathematical topics and their relationship to physics. 		
9- Teaching and learning strategies					
Strategy			Using the face-to-face lecture method and giving students opportunities to discuss and solve daily and monthly questions and tests		
10- Course Structure					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	3	slope	Slope Intercept Form Definition	Lecture	Daily and monthly exams, assignments and reporting
Second	3	slope	Slope between Two Points	Lecture	Daily and monthly exams, assignments and reporting
Third	3	Slope	Slope of Vertical Lin Slope of <u>parallel lines</u>	Lecture	Daily and monthly exams, assignments and reporting
Fourth	3	Slope	Formula for Distance between	Lecture	Daily and monthly

			Two Points		exams, assignments and reporting
Fifth	3	Slope	the angle between two lines	Lecture	Daily and monthly exams, assignments and reporting
Sixth	3	Slope	the angle between two lines	Lecture	Daily and monthly exams, assignments and reporting
Seventh	3	Slope	Examples for the chapter one	Lecture	Daily and monthly exams, assignments and reporting
Eighth	3	Trigonometric Functions	Trigonometric Functions	Lecture	Daily and monthly exams, assignments and reporting
Ninth	3	Trigonometric Functions	Trigonometric Functions Values	Lecture	Daily and monthly exams, assignments and reporting
Tenth	3	Trigonometric Functions	Trigonometric Functions Values	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	3	Trigonometric Functions	Sum and Difference Identities	Lecture	Daily and monthly exams, assignments and reporting
Twelfth	3	Trigonometric Functions	Double Angle Identities	Lecture	Daily and monthly exams, assignments and reporting
Thirteenth	3	Trigonometric Functions	Triple Angle Identities	Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	3	Trigonometric Functions	Product identities	Lecture	Daily and monthly exams, assignments and reporting

Fifteenth	3	Trigonometric Functions basics	Examples for the chapter	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	3	Chapter 2	Monthly test	Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	3	The Exponential Function	The Exponential Function	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	3	The Exponential Function	Exponent Rules Chart and examples	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	3	The logarithmic function	The logarithmic function	Lecture	Daily and monthly exams, assignments and reporting
Twentieth	3	Example and questions	Examples for the chapter	Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	3	Monthly test	Monthly test	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	3	Derivatives	Derivatives	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	3	Derivatives	Differentiation of Trigonometric Functions	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	3	Derivatives	The Product Rule	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	3	Derivatives	Examples for the chapter	Lecture	Daily and monthly exams,

					assignments and reporting
Twenty-Six	3	Integration	Integration Rule	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	3	Integration	double integral	Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	3	Integration	Triple Integral	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	3	Integration	Examples for the chapter	Lecture	Daily and monthly exams, assignments and reporting
Thirty	3	Integration	Monthly test	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Differential and integral calculus N.Piskunov
Main references (sources)	Calculus Basics by Khaled Qasim Samou, Calculus Theory by Freddie
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	General physics websites, Shum series in mathematics

Course description form

1- Course name	
Arabic Language/ First Year	
2- Course code /	
Ar 017	
3- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
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:- Teacher:- Amane Kanaan Kheder	
8- Course objectives	
Objectives of the study subject	<ul style="list-style-type: none">- The material aims to provide the most important vocabulary of the Arabic language (in matters of grammar and morphology) in a sufficient and comprehensive manner, which touches the student's life and accompanies him in the future.- Introducing the student to the fundamentals of correct writing (such as differentiating between Arabic sentences and their types, knowing the original and secondary grammatical markers, knowing the particles that modify nominal sentences, and differentiating between sentences morphologically in terms of gender).
9- Teaching and learning strategies	

Strategy

- Lectures, student discussions, and question exchange.

10. Course Structure:

Week	Hours	Learning Outcomes	Unit/Topic	Teaching Method	Assessment Method
1	1	Know and understand	An introductory lecture and overview of the types of Arabic words and how to distinguish between them;	Lecture, Discussion	Daily and monthly exams, assignments
2	1	Know and understand	the signs of nouns, verbs, and particles, and how to differentiate between them;	Lecture, Discussion	Daily and monthly exams, assignments
3	1	Know and understand	the original grammatical markers.	Lecture, Discussion	Daily and monthly exams, assignments
4	1	Know and understand	subordinate Grammatical Markers	Lecture	Daily and monthly exams, assignments
5	1	Know and understand	Daily Quiz (1)	Lecture, Discussion	Daily and monthly exams, assignments
6	1	Know and understand	The Arabic Sentence and its Types (Verbal Sentence)	Lecture, Discussion	Daily and monthly exams, assignments
7	1	Know and understand	the Markers of Each Type (Nominal Sentence)	Lecture, Discussion	Daily and monthly exams, assignments
8	1	Know and understand	The modifiers of nominal sentences (kāna and its sisters)	Lecture, Discussion	Daily and monthly exams, assignments
9	1	Know and understand	The modifiers of nominal sentences (inna and its sisters)	Lecture, Discussion	Daily and monthly exams, assignments
10	1	Know and understand	Monthly exam	Lecture, Discussion	Daily and monthly exams, assignments
11	1	Know and understand	Verbs in terms of active passive voice	Lecture, Discussion	Daily and monthly exams, assignments
12	1	Know and understand	Verbs in terms of soundness	Lecture, Discussion	Daily and monthly exams, assignments
13	1	Know and	weakness	Lecture,	Daily and monthly

		understand	Daily Test 2	Discussion	exams, assignments
14	1	Know and understand	Gender variation (masculine)	Lecture, Discussion	Daily and monthly exams, assignments
15	1	Know and understand	Gender variation (feminine)	Lecture, Discussion	Daily and monthly exams, assignments
16	1	Know and understand	Numbers in Arabic (single and compound numbers) Tens,	Lecture, Discussion	Daily and monthly exams, assignments
17	1	Know and understand	compound numbers, and large numbers (hundred, thousand, and million)	Lecture, Discussion	Daily and monthly exams, assignments
18	1	Know and understand	Writing the hamza in Arabic	Lecture, Discussion	Daily and monthly exams, assignments
19	1	Know and understand	Daily test (1)	Lecture, Discussion	Daily and monthly exams, assignments
20	1	Know and understand	The hamzat al-wasl and hamzat al-qat	Lecture, Discussion	Daily and monthly exams, assignments
21	1	Know and understand	The closed ta' and how to write it	Lecture, Discussion	Daily and monthly exams, assignments
22	1	Know and understand	The open ta' and how to write it	Lecture, Discussion	Daily and monthly exams, assignments
23	1	Know and understand	The difference between dad and dha'	Lecture, Discussion	Daily and monthly exams, assignments
24	1	Know and understand	Daily test (2)	Lecture, Discussion	Daily and monthly exams, assignments
25	1	Know and understand	Punctuation marks / Part 1	Lecture, Discussion	Daily and monthly exams, assignments
26	1	Know and understand	Common Grammatical	Lecture, Discussion	Daily and monthly exams, assignments
27	1	Know and understand	Error	Lecture, Discussion	Daily and monthly exams, assignments
28	1	Know and understand	Monthly Exam	Lecture, Discussion	Daily and monthly exams, assignments
29	1	Know and understand	Common Linguistic Errors	Lecture, Discussion	Daily and monthly exams, assignments
30	1	Know and understand	Common Morphological Errors	Lecture, Discussion	Daily and monthly exams, assignments

11- Course Evaluation

- Monthly exam score: 50
- Final exam score: 50

12- learning and Teaching Resources

- Required textbooks (if applicable):	General Arabic Curriculum 1/ Al-Tuhfa al-Saniyya: A Commentary on Al-Ajrumiyya by Muhammad Muhyi al-Din Abd al-Hamid (may God have mercy on him). 2/ Jami' al-Durus al-'Arabiyya by Sheikh Mustafa al-Ghalayini. 3/ How to Master Grammar by Ahmad Iskandar.
Main references (sources)	Specialized Websites + Electronic Reports and Research

Course description form

1- Course name	
Human rights and democracy / First Year	
2- Course code /	
Hr 013	
3- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
6- Number of study hours (total) / number of units (total)	
30 hour	
7- Name of the course administrator (if more than one name is mentioned)	
Name:- Teacher:- Omar Sahab Ayid , Email:-: Omar.ayid122@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	• To equip students with skills related to human rights and democracy
9- Teaching and learning strategies	
Strategy	- Lectures, student discussions, and question exchange.

10. Course Structure:					
Week	Hours	Learning Outcomes	Unit/Topic	Teaching Method	Assessment Method
1	1	Basic concepts	Course Overview, Objectives, and Learning Outcomes	Lecture, Discussion	Daily and monthly exams, assignments
2	1	Basic concepts	Introduction to the Concept of Human Rights and its Historical Development Characteristics of Human Rights	Lecture, Discussion	Daily and monthly exams, assignments
3	1	Basic concepts	International Sources of Human Rights	Lecture, Discussion	Daily and monthly exams, assignments
4	1	Basic concepts	The Universal Declaration of Human Rights and the International Covenants Grave Violations of Human Rights (Genocide, Crimes Against Humanity, and Torture)	Lecture	Daily and monthly exams, assignments
5	1	Basic concepts	Identification of Specific Group Rights (Women, Children, Minorities, and Displaced Persons)	Lecture, Discussion	Daily and monthly exams, assignments
6	1	Basic concepts	National and Procedural	Lecture, Discussion	Daily and monthly exams, assignments

7	1	Basic concepts	Mechanisms for Human Rights	Lecture, Discussion	Daily and monthly exams, assignments
8	1	Basic concepts	The Concept of the International Bill of Human Rights	Lecture, Discussion	Daily and monthly exams, assignments
9	1	Basic concepts	National Mechanisms and Procedures for Implementing Specific or Group Rights	Lecture, Discussion	Daily and monthly exams, assignments
10	1	Basic concepts	Human Rights in Islamic Legislation Historical Development of Human Rights	Lecture, Discussion	Daily and monthly exams, assignments
11	1	Basic concepts	Gross Human Rights Violations	Lecture, Discussion	Daily and monthly exams, assignments
12	1	Basic concepts	International Human Rights Law and the Protection of Human Rights in Conflicts Grave Human Rights	Lecture, Discussion	Daily and monthly exams, assignments
13	1	Basic concepts	Violations in Iraq Human Rights Councils and Human Rights	Lecture, Discussion	Daily and monthly exams, assignments
14	1	Basic concepts	Protection Mechanisms	Lecture, Discussion	Daily and monthly exams, assignments
15	1	Basic concepts	International and Regional Human Rights Protection Mechanisms	Lecture, Discussion	Daily and monthly exams, assignments

			and Accountability		
16	1	Basic concepts	Procedures National and Procedural Mechanisms for the Protection of Human Rights	Lecture, Discussion	Daily and monthly exams, assignments
17	1	Basic concepts	Contemporary Challenges in the Field of Human Rights	Lecture, Discussion	Daily and monthly exams, assignments
18	1	Basic concepts	Democracy Historical Origins and Development	Lecture, Discussion	Daily and monthly exams, assignments
19	1	Basic concepts	The Evolution of Democracy in Modern Times and its	Lecture, Discussion	Daily and monthly exams, assignments
20	1	Basic concepts	Consequences Democracy in the Twentieth Century: Between Totalitarianism and Global Expansion	Lecture, Discussion	Daily and monthly exams, assignments
21	1	Basic concepts	Patterns of Democracy and Their Development in Contemporary Contexts	Lecture, Discussion	Daily and monthly exams, assignments
22	1	Basic concepts	Islam and Democracy Democracy in Practice	Lecture, Discussion	Daily and monthly exams, assignments
23	1	Basic concepts	Democracy in Comparative and Contemporary Contexts:	Lecture, Discussion	Daily and monthly exams, assignments
24	1	Basic	Issues and	Lecture,	Daily and

		concepts	Application	Discussion	monthly exams, assignments
25	1	Basic concepts	The Democratic Experience in Iraq After 2003	Lecture, Discussion	Daily and monthly exams, assignments
26	1	Basic concepts	The 2005 Constitution of the Republic of Iraq	Lecture, Discussion	Daily and monthly exams, assignments
27	1	Basic concepts	The Nature of the System of Government under the 2005	Lecture, Discussion	Daily and monthly exams, assignments
28	1	Basic concepts	Institutions and Mechanisms of Democracy Elections as a Mechanism for Democracy	Lecture, Discussion	Daily and monthly exams, assignments
29	1	Basic concepts	Constitution Political	Lecture, Discussion	Daily and monthly exams, assignments
30	1	Basic concepts	Pluralism, Free and Fair Elections	Lecture, Discussion	Daily and monthly exams, assignments

11- Course Evaluation

- Monthly exam score: 50

- Final exam score: 50

12- learning and Teaching Resources

- Required textbooks (if applicable):

human rights and democracy

Main references (sources)

Course description form

1- Course name					
Electricity / n ^{2d} stage					
2- Course code /					
ELP 032					
3- Semester / year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5- Available attendance forms					
Day					
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: Prof. dr. : Adnan R. Ahmed , Email:- amazonq797@tu.edu.iq					
8- Course objectives					
Objectives of the study subject			Electricity & magnetism Force on an charge moving in a magnetic field • Study the conservation and its applications . • Studying of attractive and its Law • Studying Gauss surfaces • Study the columns law . • studying the point charge . • studying the Faraday's law . Bayo s –savert law Application of bayots savert law		
9- Teaching and learning strategies					
Strategy			Lecture style, discussing with students, and asking and exchanging questions with students		
10- Course Structure					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	2	Magnetic field		Lecture	Daily and monthly exams, assignments and reporting

Second	2	Magnetic flux		Lecture	Daily and monthly exams, assignments and reporting
Third	2	Force on an charge moving in a magnetic field		Lecture	Daily and monthly exams, assignments and reporting
Fourth	2	First Exam		Lecture	Daily and monthly exams, assignments and reporting
Fifth	2	Movement of an electrically charged particle in a magnetic field		Lecture	Daily and monthly exams, assignments and reporting
Sixth	2	Thomson's experiment to measure the ratio of electron charge to it mass		Lecture	Daily and monthly exams, assignments and reporting
Seventh	2	Hall effect		Lecture	Daily and monthly exams, assignments and reporting
Eighth	2	The force on conductor in which an electric current in a magnetic field		Lecture	Daily and monthly exams, assignments and reporting
Ninth	2	Torque on a coil through which an electric current in a magnetic passes		Lecture	Daily and monthly exams, assignments and reporting
Tenth	2	Second Exam		Lecture	Daily and monthly exams, assignments and reporting
Eleventh	2	Movement coil galvanometer		Lecture	Daily and monthly exams, assignments and reporting
Twelfth	2	Bayo s –savert law Application of bayots savert law		Lecture	Daily and monthly exams,

		Magnetic induction of a moving electric change			assignments and reporting
Thirteenth	2	The force between two long parallel straight wires , each of which is electric current Law of the - amper circle Applications of law of the amper circle		Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	2	third Exam		Lecture	Daily and monthly exams, assignments and reporting
Fifteenth	2	Electric induced force thrust Fara day's law Measure B by using search coil Fara day's disc Electric generator		Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	2	Mutual induction Self-induction Energy stored in the magnetic field Magnetic energy density Linking inductors Electrical transformer		Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	2	The current Power in Ac circuits The effective value of the alternating current and alternating voltage Voltage difference direction chart Resounds		Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	2	Four examination		Lecture	Daily and monthly exams, assignments and reporting

Nineteenth	2	Magnetic field		Lecture	Daily and monthly exams, assignments and reporting
Twentieth	2	Magnetic flux		Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	2	Force on an charge moving in a magnetic field		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	2	First Exam		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	2	Movement of an electrically charged particle in a magnetic field		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	2	Thomson's experiment to measure the ratio of electron charge to it mass		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	2	Hall effect		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Six	2	The force on conductor in which an electric current in a magnetic field		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	2	Torque on a coil through which an electric current in a magnetic passes		Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	2	Second Exam		Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	2	Movement coil galvanometer		Lecture	Daily and monthly exams,

					assignments and reporting
Thirty	2	Bayots –savert law Application of bayots savert law Magnetic induction of a moving electric change		Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

score for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	
Main references (sources)	Electricity and magnetism
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	

Course description form

1- Course name					
Sound and wave motion / Second stage					
2- Course code /					
ATP023					
3- Semester / year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5- Available attendance forms					
Day					
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:- Prof. Dr:- Nadim Khalid Hassan , Email:- nadimkh4@tu.edu.iq					
8- Course objectives					
			<p>. Understanding basic concepts in wave motion.</p> <p>. Studying free Oscillation.</p> <p>.Study of superposition of simple harmonic motions.</p> <p>.Investigating damped Oscillation.</p> <p>.Exploring forced Oscillation.</p> <p>.Studying transverse waves in one dimension.</p> <p>.Studying longitudinal waves (sound waves).</p> <p>.General considerations in sound and wave phenomena.</p>		
9- Teaching and learning strategies					
Strategy			The lecture style, discussing students, asking and circulating questions with students		
10- Course Structure					
Week	Hour s	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	2	Sound and wave motion	Basic concepts	Lecture	Daily and monthly exams,

					assignments and reporting
Second	2	Sound and wave motion	Types of Mechanical Wave Motion	Lecture	Daily and monthly exams, assignments and reporting
Third	2	Free Oscillation	Equation of Simple Harmonic Motion	Lecture	Daily and monthly exams, assignments and reporting
Fourth	2	Free Oscillation	Energy of the Simple Harmonic Oscillator	Lecture	Daily and monthly exams, assignments and reporting
Fifth	2	Free Oscillation	Applications of Simple Harmonic Motion	Lecture	Daily and monthly exams, assignments and reporting
Sixth	2	Superposition of Simple Harmonic Motions –	Principle of Superposition	Lecture	Daily and monthly exams, assignments and reporting
Seventh	2	Superposition of Simple Harmonic Motions –	Superposition Two Simple Harmonic Motions	Lecture	Daily and monthly exams, assignments and reporting
Eighth	2	Superposition of Simple Harmonic Motions –	Graphical Method for Superposition Two Perpendicular Simple Harmonic Motions	Lecture	Daily and monthly exams, assignments and reporting
Ninth	2	Damped Oscillation	The Force Causing Damped Oscillation	Lecture	Daily and monthly exams, assignments and reporting
Tenth	2	Damped Oscillation	Equation of Damped Harmonic Motion	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	2	Damped Oscillation	Solution of the Damped	Lecture	Daily and monthly

			Harmonic Motion Equation		exams, assignments and reporting
Twelfth	2	Forced Oscillation	Solution of the Forced Motion Equation	Lecture	Daily and monthly exams, assignments and reporting
Thirteenth	2	Forced Oscillation	Resonance and Amplitude of Oscillation at Resonance	Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	2	Forced Oscillation	The Relationship Between Resonance Frequency and the Natural Frequencies of the Oscillator	Lecture	Daily and monthly exams, assignments and reporting
Fifteenth	2	Transverse Waves in One Dimension	Transverse Wave Motion in One Dimension	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	2	Transverse Waves in One Dimension	Equation of Transverse Wave Motion in a Oscillating String	Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	2	Transverse Waves in One Dimension	Standing Waves, Free Oscillation of a Stretched and Finite-Length String, and the Sonometer	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	2	Transverse Waves in One Dimension	Laws of Oscillating Strings	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	2	Longitudinal Waves (Sound Waves)	Longitudinal Waves in a Metal Rod and a Column of Fluid	Lecture	Daily and monthly exams, assignments and reporting
Twentieth	2	Longitudinal Waves (Sound Waves)	Equation of the Sound Wave in Terms of Pressure	Lecture	Daily and monthly exams, assignments and reporting

Twenty-one	2	Longitudinal Waves (Sound Waves)	Standing Longitudinal Waves in Resonance Tubes	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	2	Sound and the Wave Phenomenon	Pitch, Loudness, Timbre, Pure (or Inaudible) Sounds	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	2	Sound and the Wave Phenomenon	Decibel Scale, Noise or Disturbance	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	2	Sound and the Wave Phenomenon	Factors Affecting the Speed of Sound Waves in Air	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	2	Sound and the Wave Phenomenon	Properties of Sound Waves	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Six	2	Sound and the Wave Phenomenon	Doppler Effect	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	2	Ultrasonic Waves and Their Applications	Mechanism of Generation of Ultrasonic Waves Components of an Ultrasonic Wave Device	Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	2	Ultrasonic Waves and Their Applications	Effect of Ultrasonic Waves on Biological Cells	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	2	Ultrasonic Waves and Their Applications	Behavior of Ultrasonic Waves in the Human Body	Lecture	Daily and monthly exams, assignments and reporting
Thirty	2	Ultrasonic Waves and Their Applications	Some Applications of Ultrasonic Waves	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Sound and Wave Motion Physics Amjad Gorgeah
Main references (sources)	1. Mechanics and Properties of Matter , By: Kohle 2.Acoustics ,Shom Series
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	General physics websites

Course description form

1- Course name					
Optics / n ^{2d} stage					
2- Course code /					
OPP 012					
3- Semester / year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5- Available attendance forms					
Day					
6- Number of study hours (total) / number of units (total)					
90 hour					
7- Name of the course administrator (if more than one name is mentioned)					
Name: Prof. dr. : Abdullah M. Ali , Email:- abdullah.ma1763@tu.edu.iq					
8- Course objectives					
Objectives of the study subject			The nature of light & Electromagnetic spectrum <ul style="list-style-type: none"> Study the Refraction Reflection phenomena . Studying the lens & and its laws controlled on that. Studying the mirrors and its laws controlled on that. Study the aberration monochromatic , spherical . studying the diffraction & polarization. studying the interference . 		
9- Teaching and learning strategies					
Strategy			Lecture style, discussing with students, and asking and exchanging questions with students		
10- Course Structure					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	3	THE NATURE AND PROPAGATION		Lecture	Daily and monthly exams,

		OF LIGHT The nature of Light , wave from and rays , Index of refraction , The electromagnetic Spectrum , problems .			assignments and reporting
Second	3	REFLECTION AND REFRACTION Reflection and refraction at plane surface, the laws of reflection and refraction , Ray treatment of reflection and refraction , the principle of Reversibility, Fermats principle , problems.		Lecture	Daily and monthly exams, assignments and reporting
Third	3	SPHERICAL SURFACES Focal points and Focal lengths, Image formation, Virtual Images, conjugate points and planes, Convention of signs, Graphical constructions , the parallel Ray method, Oblique – Ray methods, Magnification , Reduced vergence, Derivation of Gaussian Formula, problems .		Lecture	Daily and monthly exams, assignments and reporting
Fourth	3	First Exam		Lecture	Daily and monthly exams, assignments and reporting
Fifth	3	LENSES Thin lenses, focal points and focal lengths, Image		Lecture	Daily and monthly exams, assignments

		Formation , Conjugates points and planes , the parallel –Ray method, The oblique- Ray method Use of lens formula, Lateral Magnification , virtual Images , Lens Markers formula, Thin – Lens combinations, the power of a thin Lens , Derivation of the Lens Makers formula. Thick Lenes, Two spherical surfaces, Focal points and principal points ,General thick – Lens Formula			and reporting
Sixth	3	SPHERICAL MIRRORS Focal point and Focal Length, Graphical construction's, Mirror Formulas, power of Mirrors, Thick mirrors, Thick – Mirror Formulas, other thick Mirrors , problems		Lecture	Daily and monthly exams, assignments and reporting
Seventh	3	A BERRIONS OF LENSES AND MIRRORS A berrations , Spherical aberration of a lens , Spherical aberration of Mirrors, coma, Astigmatism ,curvature of field , kinds of aberration .		Lecture	Daily and monthly exams, assignments and reporting
Eighth	3	Second Exam		Lecture	Daily and monthly exams, assignments

					and reporting
Ninth	3	OPTICAL INSTRUMENTS The eye , Defects of vision , Spectacle , the simple microscope Magnifier , Refracting telescopes, Normal magnification , the reflecting telescope , camera, stops, the rangefinder, problems.		Lecture	Daily and monthly exams, assignments and reporting
Tenth	3	INTERFERENCE Huygen's principle , Young's Experiment , Interference Fringes from a Double source , Intensity Distribution in the fringe system , , Coherent sources , Division of Amplitude. Fringes of Equal Inclination , Newton's Rings, problems.		Lecture	Daily and monthly exams, assignments and reporting
Eleventh	3	DIFFRACTION Fresnel fraunhofer diffraction , by a single slit, Further		Lecture	Daily and monthly exams, assignments and reporting
Twelfth	3	Investigation of single – slit		Lecture	Daily and monthly exams, assignments and reporting
Thirteenth	3	Third Exam		Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	3	Aperture, Resolving power with a Rectangular Aperture, Chromatic		Lecture	Daily and monthly exams, assignments and reporting

Fifteenth	3	Resolving power of a prism,		Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	3	Circular Aperture,		Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	3	Diffraction pattern, Rectangular		Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	3	Resolving power of a Telescope		Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	3	, Resolving power of a Microscope,		Lecture	Daily and monthly exams, assignments and reporting
Twentieth	3	The Double slit, qualitative Aspects of the pattern,		Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	3	Derivation of the Equation for the Intensity,		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	3	Comparison of the single- slit		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	3	and Double – slit		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	3	patterns, Distinction,		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	3	between Interference and Diffraction		Lecture	Daily and monthly exams,

					assignments and reporting
Twenty-Six	3	problems.		Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	3	POLARIZATION Polarization by Reflection , Representation of.		Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	3	the Vibrations in light , polarization Angle and Brewsters law ,		Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	3	polarization by a pile of plates, law of Malus, polarization by Dichroic crystals		Lecture	Daily and monthly exams, assignments and reporting
Thirty	3	polarization by Double Refraction, polarization by scattering , problems		Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Whit ,optics SEARS
Main references (sources)	physical optics
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	Optics and Photonics (2007) Graham Smith + Terry A.King

Course description form

1- course name	
Astronomy- second stage	
2- course code:	
SSP052	
3-Semester / year	
2024/2023	
4- Date this description was prepared	
2023/9/3	
5- Available attendance forms	
Daily	
6- Number of study hours (total) / number of units (total)	
60 hours	
7-Name of the course	
administrator (if more than one name is mentioned)	
Name: Assist prof .Dr. Kawkab Dawood Salim, e.mail: kawkab_badri@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	<ul style="list-style-type: none">. Learn about astrophysics.. Study of the celestial sphere. Study of galaxies, their speed and mass. Study of stars, their masses, speeds and distances between them. Study of planets, dwarf planets and asteroids<ul style="list-style-type: none">. Study of comets, meteors and meteors.. Study of black holes and quasars.. Study of dark matter
9- Teaching and learning strategies	
Strategy	Lecture style, discussing with students, and asking and exchanging questions with students
Course Structure -10	

Week	Hours	Name of the unit	Required learning outcomes	Learning method	Evaluation method
First	2	Unit one	Kepler's laws, celestial sphere, astronomical units	Lecture	Daily and 1 monthly exams, assignments and reporting
Second	2	Unit one	Celestial coordinate system	Lecture	Daily and monthly exams, assignments and reporting
Third	2	Unit two	Physical properties of sun and moon	Lecture	Daily and monthly exams, assignments Daily and monthly exams, assignments and reporting
Fourth	2	Unit three	physical properties of planets	Lecture	Daily and monthly exams, assignments and reporting
Fifth	2	Unit four	optical properties of stars	Lecture	Daily and monthly exams, assignments and reporting
Sixth	2	Unit four	R-H diagram of stars and problems	Lecture	Daily and monthly exams, assignments and reporting
Seventh	2	Unit four	Types of stars and their life cycle	Lecture	Daily and monthly exams, assignments and reporting
Eight		-----	1st exam		الثامن
Ninth	2	Unit five	the stars systems	Lecture	Daily and monthly exams, assignments and reporting
Tenth	2	Unit five	Calculating the mass of stars in terms of the mass of the sun	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	2	Sixth unit	Optical properties of milkt way	Lecture	Daily and monthly exams, assignments and reporting
Twelfth	2	Unit seventh	Types of galaxies	Lecture	Daily and monthly exams,

					assignments and reporting
Thirteenth	2	Unit seventh	effective galaxies types	Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	2	Unit eighth	Quasars, the age of the universe, and the Hubble constant	Lecture	Daily and monthly exams, assignments and reporting
Fifteenth	2	Unit eighth	Theories of the origin of the universe and life in the universe	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	2	----	Second exam		

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Course: The Book of Space, Part Two - Astronomy - Dr. Abdul Hamid Majoul Al-Naimi
Main references (sources) -	- Pathways to Astronomy Stephen E. Schneider
... Recommended supporting books and references (scientific journals, (...التقارير reports...))	
Electronic references, Internet sites	www.nasa.gov

Course description form

1- Course name	
Curricula and textbooks / Second Year	
2- Course code / CuT015	
Bachelor's	
3- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
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:- Teacher:- Ahmed Taleb Sabar , Email:- ahmed.s.m.o.j@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	<ul style="list-style-type: none">- Deepen the undergraduate researcher's knowledge of scientific research steps.- Introduce the researcher to the concept of research and the scientific method.- Enable the researcher to define research hypotheses and problems.- Familiarize the researcher with research classifications based on goals and methods.- Introduce the researcher to research tools, their role in data collection, and their validity and reliability.
9- Teaching and learning strategies	
Strategy	<ul style="list-style-type: none">- Lecture method and student discussions.- Engaging students with questions and exchanges.

10. Course Structure:

Week	Hours	Learning Outcomes	Unit/Topic Name	Teaching Method	Assessment Method
1	2	Comprehension, Analysis, Synthesis	Origin and Evolution of Science and Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
2	2	Comprehension, Analysis, Synthesis	Scientific Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
3	2	Comprehension, Analysis, Synthesis	Types of Scientific Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
4	2	Comprehension, Analysis, Synthesis	Research Problems, Plans, and Hypotheses	Lecture, Discussion	Daily and Monthly Exams, Assignments
5	2	Comprehension, Analysis, Synthesis	Scientific Research Methods and Tools	Lecture, Discussion	Daily and Monthly Exams, Assignments
6	2	Comprehension, Analysis, Synthesis	Historical Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
7	2	Comprehension, Analysis, Synthesis	Survey Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
8	2	Comprehension, Analysis, Synthesis	Descriptive Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
9	2	Comprehension, Analysis, Synthesis	Comparative Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
10	2	Comprehension, Analysis, Synthesis	Theoretical Mathematical Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
11	2	Comprehension, Analysis, Synthesis	Experimental Method	Lecture, Discussion	Daily and Monthly Exams, Assignments
12	2	Comprehension, Analysis, Synthesis	Key Requirements for Experimental Research	Lecture, Discussion	Daily and Monthly Exams, Assignments

13	2	Comprehension, Analysis, Synthesis	Sources of Information	Lecture, Discussion	Daily and Monthly Exams, Assignments
14	2	Comprehension, Analysis, Synthesis	Databases	Lecture, Discussion	Daily and Monthly Exams, Assignments
15	2	Comprehension, Analysis, Synthesis	Information Networks	Lecture, Discussion	Daily and Monthly Exams, Assignments
16	2	Comprehension, Analysis, Synthesis	Scientific Research Writing	Lecture, Discussion	Daily and Monthly Exams, Assignments
17	2	Comprehension, Analysis, Synthesis	Main Sections of Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
18	2	Comprehension, Analysis, Synthesis	Writing Style and General Format	Lecture, Discussion	Daily and Monthly Exams, Assignments
19	2	Comprehension, Analysis, Synthesis	Rules for Writing Footnotes	Lecture, Discussion	Daily and Monthly Exams, Assignments
20	2	Comprehension, Analysis, Synthesis	Main and Subheadings (Subdivisions)	Lecture, Discussion	Daily and Monthly Exams, Assignments
21	2	Comprehension, Analysis, Synthesis	Referencing by Numbers	Lecture, Discussion	Daily and Monthly Exams, Assignments
22	2	Comprehension, Analysis, Synthesis	Samples	Lecture, Discussion	Daily and Monthly Exams, Assignments
23	2	Comprehension, Analysis, Synthesis	Guidelines for Preparing Tables	Lecture, Discussion	Daily and Monthly Exams, Assignments
24	2	Comprehension, Analysis, Synthesis	Summary or Abstract Section	Lecture, Discussion	Daily and Monthly Exams, Assignments
25	2	Comprehension, Analysis, Synthesis	References or Sources Section	Lecture, Discussion	Daily and Monthly Exams, Assignments
26	2	Comprehension, Analysis,	Methods of Citing	Lecture, Discussion	Daily and Monthly

		Synthesis	References		Exams, Assignments
27	2	Comprehension, Analysis, Synthesis	Published Research in Scientific Journals	Lecture, Discussion	Daily and Monthly Exams, Assignments
28	2	Comprehension, Analysis, Synthesis	Card Indexing System	Lecture, Discussion	Daily and Monthly Exams, Assignments
29	2	Comprehension, Analysis, Synthesis	Illustrative Figures in Research	Lecture, Discussion	Daily and Monthly Exams, Assignments
30	2	Comprehension, Analysis, Synthesis	Maps and Other Figures	Lecture, Discussion	Daily and Monthly Exams, Assignments

11- Course Evaluation

- Monthly Exams: 50%
- Final Exam: 50%

12- learning and Teaching Resources

Required textbooks (methodology, if any)	*Scientific Research Methods: For Primary Levels*
Main references (sources)	*Boyer, Carol, Science (Electronic Scientific Encyclopedia), 1998.*
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	Nothing

Course description form

1. Course Name:					
English Language / Second Stage					
2. Course Code:					
EL 443					
3. Semester / Year:					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5. Available Attendance Forms:					
Daily					
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: Assist. Teacher :- Rola Fawwaz Hammad , Email: rula.f.hammad@tu.edu.iq					
8. Course Objectives					
Course Objectives			<ul style="list-style-type: none"> • learning the basics of English language <input type="checkbox"/> studying some tenses <input type="checkbox"/> studying some English styles for speaking • studying some physical terms 		
9. Teaching and Learning Strategies					
Strategy	Lecture style, discussing with students, and asking questions to students				
10. Course Structure					
Week	Hours	Learning Outcomes	Unit/Topic Name	Teaching Method	Assessment Method
First	1	Learn what is the basics of English Language	Basics of English	Lecture	Quiz
Second	1	How and when this tense is used	Present simple tense	Lecture	Monthly exam
Third	1	Training for reading	Reading	Lecture	Daily listening

Fourth	1	How and when this tense is used	Future simple tense	Lecture	Monthly& daily exam
Fifth	1	How this style is used	First conditional (If clause)	Lecture	Monthly& daily exam
Sixth	1	How to use this style	Future passive	Lecture	Monthly& daily exam
Seventh	1	How to use this style	Present passive	Lecture	Monthly& daily exam
Eighth	1	Students' Evaluation	First exam	Lecture	Monthly exam
Ninth	1	Knowing some physical terms	Terms	Lecture	Quiz
Tenth	1	Training for Speaking	Speaking	Lecture	Daily participants
Eleventh	1	Training for reading	Reading	Lecture	Daily participants
Twelfth	1	How to read decimal numbers	Reading decimals	Lecture	Monthly& daily exam
Thirteenth	1	How to read years	Reading years	Lecture	Monthly& daily exam
Fourteenth	1	Knowing the time	Telling the time	Lecture	Monthly& daily exam
Fifteenth	1	What is the difference between such styles	So & such	Lecture	Monthly& daily exam
Sixteenth	1	-----	Second exam	Lecture	Monthly exam
Seventeenth	1	Training for writing	Story time	Lecture	Monthly& daily exam
Eighteenth	1	Knowing some definitions	Definitions	Lecture	Monthly& daily exam
Nineteenth	1	How to use this style	Comparative	Lecture	Monthly& daily exam
Twentieth	1	How to use this style	Superlative	Lecture	Monthly& daily exam

Twenty first	1	Knowing such a style in 2 nd language	Polite Descripting	Lecture	Monthly& daily exam
Twenty second	1	-----	Third Exam	Lecture	Monthly exam
Twenty third	1	Knowing the Meaning of some terms	Physical terms	Lecture	Monthly& daily exam
Twenty fourth	1	Reinforcement students' knowledge of vocabulary	Vocabulary	Lecture	Monthly& daily exam
Twenty fifth	1	Reinforcement students' knowledge	Synonyms	Lecture	Monthly& daily exam
Twenty sixth	1	Reinforcement students' knowledge	Antonyms	Lecture	Monthly& daily exam
Twenty seventh	1	Reinforcement students' knowledge	Matching	Lecture	Monthly& daily exam
Twenty eighth	1	Identify some linguistic techniques for speaking	Obligation	Lecture	Monthly& daily exam
Twenty ninth	1	-----	Review	Lecture	-----
Thirtieth	1	Students' Evaluation	Fourth Exam	Lecture	Monthly exam

11- Course Evaluation

- Monthly Exams: 50%
- Final Exam: 50%

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Textbooks approved by the Ministry of Higher Education and Scientific Research
Main references (sources)	Nothing
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	Nothing

Course description form

1- Course name	
Arabic Language/ Second Year	
2- Course code /	
Ar 018	
3- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
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:- Teacher:- Amane Kanaan Kheder	
8- Course objectives	
Objectives of the study subject	<ul style="list-style-type: none">- The material aims to provide the most important vocabulary of the Arabic language (in matters of grammar and morphology) in a sufficient and comprehensive manner, which touches the student's life and accompanies him in the future.- Introducing the student to the fundamentals of correct writing (such as differentiating between Arabic sentences and their types, knowing the original and secondary grammatical markers, knowing the particles that modify nominal sentences, and differentiating between sentences morphologically in terms of gender).
9- Teaching and learning strategies	

Strategy

- Lectures, student discussions, and question exchange.

10. Course Structure:

Week	Hours	Learning Outcomes	Unit/Topic	Teaching Method	Assessment Method
1	1	Know and understand	An introductory lecture and overview of the types of Arabic words and how to distinguish between them;	Lecture, Discussion	Daily and monthly exams, assignments
2	1	Know and understand	the signs of nouns, verbs, and particles, and how to differentiate between them;	Lecture, Discussion	Daily and monthly exams, assignments
3	1	Know and understand	the original grammatical markers.	Lecture, Discussion	Daily and monthly exams, assignments
4	1	Know and understand	subordinate Grammatical Markers	Lecture	Daily and monthly exams, assignments
5	1	Know and understand	Daily Quiz (1)	Lecture, Discussion	Daily and monthly exams, assignments
6	1	Know and understand	The Arabic Sentence and its Types (Verbal Sentence)	Lecture, Discussion	Daily and monthly exams, assignments
7	1	Know and understand	the Markers of Each Type (Nominal Sentence)	Lecture, Discussion	Daily and monthly exams, assignments
8	1	Know and understand	The modifiers of nominal sentences (kāna and its sisters)	Lecture, Discussion	Daily and monthly exams, assignments
9	1	Know and understand	The modifiers of nominal sentences (inna and its sisters)	Lecture, Discussion	Daily and monthly exams, assignments
10	1	Know and understand	Monthly exam	Lecture, Discussion	Daily and monthly exams, assignments
11	1	Know and understand	Verbs in terms of active passive voice	Lecture, Discussion	Daily and monthly exams, assignments
12	1	Know and understand	Verbs in terms of soundness	Lecture, Discussion	Daily and monthly exams, assignments
13	1	Know and	weakness	Lecture,	Daily and monthly

		understand	Daily Test 2	Discussion	exams, assignments
14	1	Know and understand	Gender variation (masculine)	Lecture, Discussion	Daily and monthly exams, assignments
15	1	Know and understand	Gender variation (feminine)	Lecture, Discussion	Daily and monthly exams, assignments
16	1	Know and understand	Numbers in Arabic (single and compound numbers) Tens,	Lecture, Discussion	Daily and monthly exams, assignments
17	1	Know and understand	compound numbers, and large numbers (hundred, thousand, and million)	Lecture, Discussion	Daily and monthly exams, assignments
18	1	Know and understand	Writing the hamza in Arabic	Lecture, Discussion	Daily and monthly exams, assignments
19	1	Know and understand	Daily test (1)	Lecture, Discussion	Daily and monthly exams, assignments
20	1	Know and understand	The hamzat al-wasl and hamzat al-qat	Lecture, Discussion	Daily and monthly exams, assignments
21	1	Know and understand	The closed ta' and how to write it	Lecture, Discussion	Daily and monthly exams, assignments
22	1	Know and understand	The open ta' and how to write it	Lecture, Discussion	Daily and monthly exams, assignments
23	1	Know and understand	The difference between dad and dha'	Lecture, Discussion	Daily and monthly exams, assignments
24	1	Know and understand	Daily test (2)	Lecture, Discussion	Daily and monthly exams, assignments
25	1	Know and understand	Punctuation marks / Part 1	Lecture, Discussion	Daily and monthly exams, assignments
26	1	Know and understand	Common Grammatical	Lecture, Discussion	Daily and monthly exams, assignments
27	1	Know and understand	Error	Lecture, Discussion	Daily and monthly exams, assignments
28	1	Know and understand	Monthly Exam	Lecture, Discussion	Daily and monthly exams, assignments
29	1	Know and understand	Common Linguistic Errors	Lecture, Discussion	Daily and monthly exams, assignments
30	1	Know and understand	Common Morphological Errors	Lecture, Discussion	Daily and monthly exams, assignments

11- Course Evaluation

- Monthly exam score: 50
- Final exam score: 50

12- learning and Teaching Resources

- Required textbooks (if applicable):	General Arabic Curriculum 1/ Al-Tuhfa al-Saniyya: A Commentary on Al-Ajrumiyya by Muhammad Muhyi al-Din Abd al-Hamid (may God have mercy on him). 2/ Jami' al-Durus al-'Arabiyya by Sheikh Mustafa al-Ghalayini. 3/ How to Master Grammar by Ahmad Iskandar.
Main references (sources)	Specialized Websites + Electronic Reports and Research

Course description form

1- Course name					
Atomic and molecular physics / third stage					
2- Course code / ATP023					
Bachelor's					
3- Semester / year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5- Available attendance forms					
Day					
6- Number of study hours (total) / number of units (total)					
90 hour					
7- Name of the course administrator (if more than one name is mentioned)					
Name:- Assist. Prof. Dr:- Mohsin Hasan Ali , Email:- muhsin.astro@tu.edu.iq					
8- Course objectives					
Objectives of the study subject			Identify atomic physics. • Study the theory of relativity. • Study of atomic structure. • Study atomic models • Study the atomic spectra of the hydrogen atom. • X-ray study. Quantum theory of the hydrogen atom.		
9- Teaching and learning strategies					
Strategy			Lecture style, discussing with students, and asking and exchanging questions with students		
10- Course Structure					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	3	Atomic physics	Basic concepts	Lecture	Daily and monthly exams, assignments and reporting
Second	3	Relativity theory	Basic concepts	Lecture	Daily and monthly exams,

					assignments and reporting
Third	3	Relativity hypotheses	Basic concepts	Lecture	Daily and monthly exams, assignments and reporting
Fourth	3	Finding the results of the theory of relativity	Finding the results of the theory of relativity	Lecture	Daily and monthly exams, assignments and reporting
Fifth	3	Lorentz transformations	Lorentz transformations	Lecture	Daily and monthly exams, assignments and reporting
Sixth	3	Study of atomic structure	Study of atomic structure	Lecture	Daily and monthly exams, assignments and reporting
Seventh	3	Atomic models	Atomic models	Lecture	Daily and monthly exams, assignments and reporting
Eighth	3	Assumptions of Bohr's model of the hydrogen atom	Assumptions of Bohr's model of the hydrogen atom	Lecture	Daily and monthly exams, assignments and reporting
Ninth	3	Assumptions of the Summerfield model of the hydrogen atom	Assumptions of the Summerfield model of the hydrogen atom	Lecture	Daily and monthly exams, assignments and reporting
Tenth	3	Know the wave properties of particles	the wave properties of particles	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	3	Learn about Herzberg's principle of inaccuracy	Learn about Herzberg's principle of inaccuracy	Lecture	Daily and monthly exams, assignments and reporting
Twelfth	3	Knowledge of electron diffraction	electron diffraction	Lecture	Daily and monthly exams, assignments and reporting
Thirteenth	3	Knowledge of DeBroglie's principle	DeBroglie's principle	Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	3	Learn about Davison's electron	Learn about Davison's electron	Lecture	Daily and monthly exams, assignments

		diffraction experiment	diffraction experiment		and reporting
Fifteenth	3	Recognize the difference between wave and particle behavior of matter	Recognize the difference between wave and particle behavior of matter	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	3	X-ray identification	X-ray identification	Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	3	Knowledge of X-ray spectra	X-ray spectra	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	3	Knowledge of X-ray diffraction	X-ray diffraction	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	3	Knowledge of fluorescent X-rays	fluorescent X-rays	Lecture	Daily and monthly exams, assignments and reporting
Twentieth	3	Identify the ways radiation interacts with matter	Identify the ways radiation interacts with matter	Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	3	Learn about the photoelectric effect	Learn about the photoelectric effect	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	3	Know the Compton effect	the Compton effect	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	3	Knowledge of the phenomenon of production and annihilation of the pair	the phenomenon of production and annihilation of the pair	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	3	Knowledge of non-radioactive transitions and the Oker phenomenon	non-radioactive transitions and the Oker phenomenon	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	3	Knowledge of	X-ray	Lecture	Daily and

		X-ray absorption	absorption		monthly exams, assignments and reporting
Twenty-Six	3	Knowledge of the quantum theory of the hydrogen atom	the quantum theory of the hydrogen atom	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	3	Knowledge of basic quantum numbers	basic quantum numbers	Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	3	Knowledge of electron configuration and Pauli exclusion principle	electron configuration and Pauli exclusion principle	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	3	Learn about molecular physics and molecular bonds	molecular physics and molecular bonds	Lecture	Daily and monthly exams, assignments and reporting
Thirty ¹	3	Knowledge of molecular spectra	molecular spectra	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Concepts in modern physics
Main references (sources)	Concepts in modern physics / written by Erth Pizer
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	General physics websites

Course description form

1- Course name					
Electronic / third stage					
2- Course code /					
Bachelor's					
3- Semester / year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5- Available attendance forms					
Day					
6- Number of study hours (total) / number of units (total)					
90 hour					
7- Name of the course administrator (if more than one name is mentioned)					
Name:- Assist. Prof. Dr:- Ibrahim Khalaf Salman, Email:- ibrahim.k.salman@tu.edu.iq					
8- Course objectives					
Objectives of the study subject			<ul style="list-style-type: none"> • Learn about semiconductors. • Study the movement of electrons and electron physics. • Study the physics of semiconductors. • Study the feedback in electronic circuits. • Study logic circuits. • Study integrated circuits. • Nanotechnology 		
9- Teaching and learning strategies					
Strategy			Lecture style, discussing with students, and asking and exchanging questions with students		
10- Course Structure					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	3	Introduction to Semiconductors	Basic concepts	Lecture	Daily and monthly exams, assignments and reporting
Second	3	Learn about the energy band theory and its effect on materials	The energy band theory in solids	Lecture	Daily and monthly exams,

					assignments and reporting
Third	3	Semiconductor Diode	Basic Concepts	Lecture	Daily and monthly exams, assignments and reporting
Fourth	3	Diode characteristics curve, temperature effect, load line and working point	Learn how to form a pn junction and the characteristics curve of a diode	Lecture	Daily and monthly exams, assignments and reporting
Fifth	3	Learn about the applications of semiconductor diodes	Applications of semiconductor diodes	Lecture	Daily and monthly exams, assignments and reporting
Sixth	3	Learn about Zener Diode and Applications	Zener Diode and Applications	Lecture	Daily and monthly exams, assignments and reporting
Seventh	3	Learn about the components of the equivalent circuit, how it works, its applications, and its effect on temperature	The equivalent circuit of a Zener diode and the effect of temperature	Lecture	Daily and monthly exams, assignments and reporting
Eighth	3	Learn about the transistor and how to connect it	Bipolar Transistor	Lecture	Daily and monthly exams, assignments and reporting
Ninth	3	Transistor Bias and Transistor Operation Limitations Emitter Bias Circuits	Transistor Bias and Load Line and Effect of Temperature on Transistor Operation	Lecture	Daily and monthly exams, assignments and reporting
Tenth	3	Knowing the parameters of transistor operation and the stability of the transistor operation	Transistor operation parameters	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	3	Learn about common emitter bias mechanism, connection methods and gain coefficients	Common emitter bias circuits	Lecture	Daily and monthly exams, assignments and reporting
Twelfth	3	Understanding Bipolar Amplifiers	Bipolar Transistor Amplifiers	Lecture	Daily and monthly exams,

					assignments and reporting
Thirteenth	3	Transistor Amplifier Working Principle and Equivalent Circuits	Transistor and Amplifier Equivalent Circuit	Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	3	Learn how multistage amplifiers work	Multistage amplifiers	Lecture	Daily and monthly exams, assignments and reporting
Fifteenth	3	Getting to know thyroesters	Thyroidesters	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	3	Types of thyristors and their applications	Thyroidesters	Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	3	Learn about field effect transistors and their types	Field Effect Transistors	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	3	Knowing how to bias field effect transistors and their applications	Bias circuits for field effect transistors and their uses	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	3	Learn about power amplifiers, their types and uses	Power amplifiers	Lecture	Daily and monthly exams, assignments and reporting
Twentieth	3	Operational Amplifiers	Power Amplifiers	Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	3	Learn about feedback and its types	Negative feedback	Lecture	Daily and monthly exams, assignments

					and reporting
Twenty-Two	3	Learn about the types of feedback loops and their effects	Negative feedback	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	3	Positive feedback	Positive feedback and oscillators	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	3	Understanding Oscillators Oscillation Terms and Types of Oscillators	Positive Feedback and Oscillators	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	3	Understanding Logic Circuits	Logic Circuits	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Six	3	Types of logic gates and their applications	Logic gates	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	3	Learn about integrated circuits, their advantages and their manufacture	Integrated circuits	Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	3	Optical etching and IC component manufacturing	Integrated circuits and layer formation	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	3	Basic Concepts of Nanomaterials	Nanotechnology	Lecture	Daily and monthly exams, assignments and reporting
Thirty¹	3	Learn about Nano Carbon and Nanotechnology Applications	Carbon Nanotubes and Nano transistors	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Electronics Basics
Main references (sources)	- Basics of Electronics / Written by Prof. Dr. Samir Atta Makki and M.D. Imad Hadi Khalil
Recommended supporting books and references (scientific journals, reports...)	Electron Physics / Written by Dr. Sobhi Saeed Al-Rawi
Electronic references, Internet sites	General physics websites

Course Description Form

1- Course name	
Analytical Mechanics / n ^{3d} stage	
2- Course code / -	
MAP043	
3- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
6- Number of study hours (total) / number of units (total)	
90 hour	
7- Name of the course administrator (if more than one name is mentioned)	
Name: Prof. dr:Niran F. Abduljabar, Email:- niran.fadhil64@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	<ul style="list-style-type: none">• Introducing students to the basics of analytical mechanics.• basic concepts in mechanics, equations of motion.• differential and integral calculus of particles.• Kepler's laws• collisions and their types.• Lagrange's equations• Hamilton's equations.• conservative forces.• first and second order
9- Teaching and learning strategies	
Strategy	Lecture style, discussing with students, and asking and exchanging questions with students

10-Course Structure

The week	Hours	Name of the unit or topic	Required learning outcomes	Teaching method	Evaluation method
2	6	Definition of basic vector concepts	Definition of basic concepts (vectors)	According to the point8Above or as needed	According to the point8Above or as needed
4	6	Vector calculator and kinematics	Vector calculus and kinematics	According to the point8Above or as needed	According to the point8Above or as needed
6	6	Velocity and acceleration in polar and plane coordinates	Velocity and acceleration in plane polar coordinates	According to the point8Above or as needed	According to the point8Above or as needed
8	6	Velocity and acceleration in cylindrical and spherical	Velocity and acceleration in cylindrical and spherical coordinates	According to the point8Above or as needed	According to the point8Above or as needed
9		First exam	First exam		
10	3	Particle dynamic	particle dynamics	According to the point8Above or as needed	According to the point8Above or as needed
11	3	Movement in a straight line	Motion in a straight line	According to the point8Above or as needed	According to the point8Above or as needed
12	3	Newton's laws of motion	Newton's laws of motion	According to the point8Above or as needed	According to the point8Above or as needed
13		Vector component and unit vector	Vector components and vector unit	According to the point8Above or as needed	According to the point8Above or as needed
13	3	Addition and subtraction of vectors	Properties of vector addition and subtraction	According to the point8Above or as needed	According to the point8Above or as needed
14	3	Mass, force and linear	Mass, Force, and Linear	According to the point8Abo	According to the point8Abo

		momentum	Momentum	ve or as needed	ve or as needed
15	3	Scalar and vector product of two vectors	Scalar and vector product of two vectors	According to the point8Above or as needed	According to the point8Above or as needed
16	3		Second exam		
17		Partial differentiation	Partial derivatives for calculating velocity and acceleration	According to the point8Above or as needed	According to the point8Above or as needed
17	3		Force as a function of position And speed	According to the point8Above or as needed	According to the point8Above or as needed
18	3	The labor base and conservative forces	Employment base and conservative forces	According to the point8Above or as needed	According to the point8Above or as needed
19	3	Potential	Potential energy function and conditions for the existence of the potential function	According to the point8Above or as needed	According to the point8Above or as needed
20	3	Delta effect	Delta effect	According to the point8Above or as needed	According to the point8Above or as needed
21	3		Solve the separation equation	According to the point8Above or as needed	According to the point8Above or as needed
22	3	Center force law of gravity	Central forces, law of gravity, potential energy in a central field	According to the point8Above or as needed	According to the point8Above or as needed
23	3	Center of mass, linear momentum, kinetic energy of a system Of	Center of mass and linear momentum Kinetic energy of a system of	According to the point8Above or as needed	According to the point8Above or as needed

		particles	particles		
24	3		Third exam		
25	3	Direct and oblique collision	Direct and oblique collisions	According to the point8Above or as needed	According to the point8Above or as needed
26	3	Lacrange and Hamilton equation	Lacrange and Hamilton equations	According to the point8Above or as needed	According to the point8Above or as needed
27	3	Oscillation theory,potential energy	Fluctuation theory, potential energy and equilibrium, stability	According to the point8Above or as needed	According to the point8Above or as needed
	3		Fourth exam		Evaluation method

11-Course Evaluation

- 1-Updating the curriculum requirements according to what is approved in international universities.
- 2- Building a computer lab for the purpose of preparing mathematical models to solve complex physical problems.

12-learning and Teaching Resources

Calculus and Analytic geometry by Goerge Thomas 7th edition	1- Required textbooks
Book by Grant R. Fowles Institute of Physics, University of Badji Mokhtar	2- Main references (sources)
	A- Recommended books and references (Scientific journals, reports,)
	B - Electronic references, websites...

Course description form

1- Course name				
Thermodynamics/third stage				
2-Course code				
THP 033				
3- Semester /year				
2025/2026				
4-Date of preparation of this description				
2025/9/3				
5- Available attendance forms				
Daily				
6- Total number of study hours/ Total number of units				
90 hours				
7- Name of the course administrator				
Prof Dr: Walla Mahphod , Email : Wlla.mahphod@tu.edu.iq				
8- Course objectives				
A1- Identifying thermal energy A2- Identifying the laws of heat transfer between substances A3- Identifying the laws of transfer of materials between their four states A4- Knowing and understanding the control of pressure and temperature in the states of matter A5- Knowing and understanding the general law of gases A6- Knowing the type of gases and the differences between them And between the ideal gas A7- Identifying the difference in the results of mathematical analysis A8- Understanding the first, second and third laws of thermodynamics			Objectives of the study subject	
9- Teaching and learning strategies				
The method of lecturing, discussing with students, and asking and exchanging questions with students			Strategy	
10- Course structure				
Evaluation method	Teaching method	Name of the unit/or topic	hours	week
According to point 8 above and as	According to point 8	Basic concepts in thermodynamics, states of matter,	6	2

needed	above and as needed	solid state, liquid state, gaseous state, plasma, gas and steam, saturated vapor		
According to point 8 above and as needed	According to point 8 above and as needed	Basic curves of evaporation and boiling, Clapyron's equation, solving examples and questions, mathematical theory in thermodynamics, general gas law	6	4
According to point 8 above and as needed	According to point 8 above and as needed	state function, compressibility, extensibility, compressibility in an ideal gas, path function, open path, closed path.	6	6
		First Exam		8
According to point 8 above and as needed	According to point 8 above and as needed	Work, work done in different processes, work done in an ideal gas, work in Vandel-Wales rates, work done by changing volume, work done by changing pressure, Focal points and principal points, General thick – Lens Formula	6	6
According to point 8 above and as needed	According to point 8 above and as needed	Equations of general state of gases, equations of state for ideal gases by theoretical and practical method, Boyle's law, Charles' law, Dalton's law, Joule's law	3	11
According to point 8 above and as needed	According to point 8 above and as needed	The general constant of gases, the Vandelois equation, pressure correction, volume correction, finding the values of the critical constants of the Vandelois equation, corresponding cases	6	13
		Second Exam		15
According to point 8 above and as needed	According to point 8 above and as needed	state modifiers for other entities, state modifiers for an open wire, state modifiers for a paramagnetic material, state modifiers for an electric cell	6	16
According to point 8 above and as needed	According to point 8 above and as needed	The first law of thermodynamics, applications of the first law of thermodynamics, results of the first law, Joule's experiment, enthalpy	6	20
According to point 8 above and as needed	According to point 8 above and as needed	Expansion, free expansion, expansion by suffocation. Joule-Kelvin experiment, derivation of the degree of transformation of gases,	6	24

		the relationship between internal energy and enthalpy.		
According to point 8 above and as needed	According to point 8 above and as needed	Heat capacity, Rieghard's method for measuring gamma, Carnot cycle, second law of thermodynamics, applications in thermodynamics	6	28
		Third Exam		29
Evaluation method	Teaching method	Name of the unit/or topic	hours	week
According to point 8 above and as needed	According to point 8 above and as needed	Basic concepts in thermodynamics, states of matter, solid state, liquid state, gaseous state, plasma, gas and steam, saturated vapor	6	2
According to point 8 above and as needed	According to point 8 above and as needed	Basic curves of evaporation and boiling, Clapyron's equation, solving examples and questions, mathematical theory in thermodynamics, general gas law	6	4
According to point 8 above and as needed	According to point 8 above and as needed	state function, compressibility, extensibility, compressibility in an ideal gas, path function, open path, closed path.	6	6
		First Exam		8
According to point 8 above and as needed	According to point 8 above and as needed	Work, work done in different processes, work done in an ideal gas, work in Vandel-Wales rates, work done by changing volume, work done by changing pressure, Focal points and principal points, General thick – Lens Formula	6	9
According to point 8 above and as needed	According to point 8 above and as needed	Equations of general state of gases, equations of state for ideal gases by theoretical and practical method, Boyle's law, Charles' law, Dalton's law, Joule's law	3	11
According to point 8 above and as needed	According to point 8 above and as needed	The general constant of gases, the Vandelois equation, pressure correction, volume correction, finding the values of the critical constants of the Vandelois equation, corresponding cases	6	13
According to point 8 above and as needed	According to point 8 above and as needed	Second Exam		15

According to point 8 above and as needed	According to point 8 above and as needed	state modifiers for other entities, state modifiers for an open wire, state modifiers for a paramagnetic material, state modifiers for an electric cell	6	16
According to point 8 above and as needed	According to point 8 above and as needed	The first law of thermodynamics, applications of the first law of thermodynamics, results of the first law, Joule's experiment, enthalpy	6	20
According to point 8 above and as needed	According to point 8 above and as needed	Expansion, free expansion, expansion by suffocation. Joule-Kelvin experiment, derivation of the degree of transformation of gases, the relationship between internal energy and enthalpy.	6	24
According to point 8 above and as needed	According to point 8 above and as needed	Heat capacity, Rieghard's method for measuring gamma, Carnot cycle,	6	28
According to point 8 above and as needed	According to point 8 above and as needed	second law of thermodynamics, applications in thermodynamics		29
		Third Exam		30

11-Course evaluation

Daily exam score: 5, daily exam score: 10, monthly exam score: 35, final exam score: 50

12- Learning and teaching resources

FUNDAMENTALS OF thermodynamics	Required prescribed books (methodology, if any).
Thermodynamics -	Main references (sources)
Thermodynamics and Schaum series	Recommended supporting books and references (scientific journals, reports)
General physics websites	Electronic references, Internet sites

Course Description Form

1. Course name					
Semiconductors/Third Stage					
2. Course code.					
Bachelor					
3. Chapter/Year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5. Available attendance forms					
weekly					
6. Number of study hours (total) / Number of units (total)					
60 hours					
7. Name of course administrator (if more than one name is given)					
Lecturer Dr. Shahad Ahmed Diab			Email:- shahed.ahmed@tu.edu.iq		
8. Course objectives					
Subject objectives		<p>Learn about crystal structures and bonding.</p> <p>Learn about crystallography.</p> <p>Learn about crystal defects and types of solids in terms of crystallization.</p> <p>Learn about the Hall effect.</p> <p>Learn about the optical and electrical properties of semiconductors.</p> <p>Understand the doping mechanism in semiconductors.</p> <p>Learn about the photoelectric properties of semiconductors.</p> <p>Understand the p-n junction</p>			
9. Teaching and learning strategies					
Strategy		Lecture style, discussing with students, and asking and exchanging questions with students			
10. Course structure					
The week	Watches	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method

the first	2	Knowing the types of bonds, the characteristics of each type, and how it is affected	Insistence	The lecture	Daily and monthly exams, assignments and reporting
the second	2	Learn about the crystal structure of materials and how to classify materials according to crystallization.	Crystal structures.	The lecture	Daily and monthly exams, assignments and reporting
the third	2	Identify the types of crystal lattices and crystal systems.	Crystal systems and the Paravisian lattice.	The lecture	Daily and monthly exams, assignments and reporting
Fourth	2	Identify crystal trends, Miller coefficients, and .inverted lattices	Crystalline trends and crystal planes.	The lecture	Daily and monthly exams, assignments and reporting
Fifth	2	Classification of crystalline defects and their details.	Crystalline defects.	The lecture	Daily and monthly exams, assignments and reporting
Sixth	2	Introduction to solid state theory and electron behavior in crystals.	Solid state theory.	The lecture	Daily and monthly exams, assignments and reporting
Seventh	2	Learn the concept of energy packages and study the types .of packages	Energy packs.	The lecture	Daily and monthly exams, assignments and reporting
eighth	2	Understand the relationship between energy and momentum.	Energy and momentum.	The lecture	Daily and monthly exams, assignments and reporting
ninth	2	Application of Fermi-Dirac statistics, knowledge of ionization of	Density of states in energy bands.	The lecture	Daily and monthly exams, assignments

		impurity atoms, phonons, Hall effect.			and reporting
tenth	2	Learn about the optical properties of semiconductors .	Properties of semiconductors.	The lecture	Daily and monthly exams, assignments and reporting
eleven	2	Study of different types of electronic transitions.	Electronic transfers.	The lecture	Daily and monthly exams, assignments and reporting
Twelve	2	Understand charge generation and combination processes, majority and minority charge carriers, and spontaneous emission.	Reproductive processes_reunion.	The lecture	Daily and monthly exams, assignments and reporting
thirteen	2	Understand the mobility of charge carriers, conductivity, resistivity, diffusion and drift of charge carriers.	Mobility of charge carriers.	The lecture	Daily and monthly exams, assignments and reporting
Fourteen	2	Understand the p-n junction, depletion region, voltage barrier and study the junction in steady state and biased state.	p-n junction	The lecture	Daily and monthly exams, assignments and reporting

11. Course Evaluation

Daily exams score: 10, Homework and reports score: 10, Monthly exam score: 30

Final exam score: 50

12. Learning and teaching resources

Required textbooks (methodology if any)

Semiconductor devices.

Main References (Sources)

Solid State Physics Part One Dr. Muayad Gabriel. Introduction to Semiconductor

	Physics Dr. Yousry Mustafa and Dr. Al-Husseini Taher.
Recommended supporting books and references (scientific journals, reports...)	nothing
Electronic references, websites	General Physics Sites

Course description form

1- Course name	
Teaching Methods / Third Year	
2- Course code /	
Tm 018	
3- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
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:- Teacher:- Ahmed Taleb Sabar , Email:- ahmed.s.m.o.j@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	<ul style="list-style-type: none">- Understanding different types of curricula.- Identifying the components of the curriculum.- Comprehending various teaching methods.- Understanding daily, term, and annual lesson plans.
9- Teaching and learning strategies	
Strategy	Lecturing to students, engaging in discussions, posing and answering questions.

10. Course Structure					
Week	Hours	Learning Outcomes	Unit/Topic Name	Teaching Method	Assessment Method
1	2	Understand, analyze, synthesize	Concept of Curriculum	Lecturing and guided exploration	Daily and monthly tests, assignments
2	2	Understand, analyze, synthesize	Old Curriculum	Lecturing and guided exploration	Daily and monthly tests, assignments
3	2	Understand, analyze, synthesize	Modern Curriculum	Lecturing and guided exploration	Daily and monthly tests, assignments
4	2	Understand, analyze, synthesize	Foundations of Curriculum Building	Lecturing and guided exploration	Daily and monthly tests, assignments
5	2	Understand, analyze, synthesize	Philosophical Foundations	Lecturing and guided exploration	Daily and monthly tests, assignments
6	2	Understand, analyze, synthesize	Psychological Foundations	Lecturing and guided exploration	Daily and monthly tests, assignments
7	2	Understand, analyze, synthesize	Methods of Curriculum Organization	Lecturing and guided exploration	Daily and monthly tests, assignments
8	2	Understand, analyze, synthesize	Social Foundations	Lecturing and guided exploration	Daily and monthly tests, assignments
9	2	Understand, analyze, synthesize	Cognitive Foundations	Lecturing and guided exploration	Daily and monthly tests, assignments
10	2	Understand, analyze, synthesize	Curriculum Elements or Components	Lecturing and guided exploration	Daily and monthly tests, assignments
11	2	Understand, analyze, synthesize	Standards and Characteristics of Educational Goals	Lecturing and guided exploration	Daily and monthly tests, assignments
12	2	Understand, analyze, synthesize	Content	Lecturing and guided exploration	Daily and monthly tests, assignments
13	2	Understand,	Teaching	Lecturing and	Daily and

		analyze, synthesize	Methods and Tools	guided exploration	monthly tests, assignments
14	2	Understand, analyze, synthesize	Evaluation Process	Lecturing and guided exploration	Daily and monthly tests, assignments
15	2	Understand, analyze, synthesize	Textbooks and Curriculum	Lecturing and guided exploration	Daily and monthly tests, assignments
16	2	Understand, analyze, synthesize	Types of School Curricula	Lecturing and guided exploration	Daily and monthly tests, assignments
17	2	Understand, analyze, synthesize	Subject- Centered Curriculum and Broad Fields Curriculum	Lecturing and guided exploration	Daily and monthly tests, assignments
18	2	Understand, analyze, synthesize	Activity-Based Curriculum and Core Curriculum	Lecturing and guided exploration	Daily and monthly tests, assignments
19	2	Understand, analyze, synthesize	Units Curriculum	Lecturing and guided exploration	Daily and monthly tests, assignments
20	2	Understand, analyze, synthesize	Teaching as Art and Science	Lecturing and guided exploration	Daily and monthly tests, assignments
21	2	Understand, analyze, synthesize	Teaching Methods	Lecturing and guided exploration	Daily and monthly tests, assignments
22	2	Understand, analyze, synthesize	Types of Teaching Methods	Lecturing and guided exploration	Daily and monthly tests, assignments
23	2	Understand, analyze, synthesize	Specific Teaching Methods	Lecturing and guided exploration	Daily and monthly tests, assignments
24	2	Understand, analyze, synthesize	Group Discussion Method	Lecturing and guided exploration	Daily and monthly tests, assignments
25	2	Understand, analyze, synthesize	Questioning Method	Lecturing and guided exploration	Daily and monthly tests, assignments
26	2	Understand,	Problem-	Lecturing and	Daily and

		analyze, synthesize	Solving Method	guided exploration	monthly tests, assignments
27	2	Understand, analyze, synthesize	Project-Based Method	Lecturing and guided exploration	Daily and monthly tests, assignments
28	2	Understand, analyze, synthesize	Cooperative Learning	Lecturing and guided exploration	Daily and monthly tests, assignments
29	2	Understand, analyze, synthesize	Programmed Learning	Lecturing and guided exploration	Daily and monthly tests, assignments
30	2	Understand, analyze, synthesize	Computer- Based Learning	Lecturing and guided exploration	Daily and monthly tests, assignments

11- Course Evaluation

- Monthly Exam Scores: 50
- Final Exam Score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Curricula and Teaching Methods for Primary Grades.
Main references (sources)	None specified.
Recommended supporting books and references (scientific journals, reports...)	None specified.
Electronic references, Internet sites	None specified.

Course description form

1- Course name					
Nuclear Physics/ Fourth Stage					
2- Course code / ATP023					
Bachelor's					
3- Semester / year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5- Available attendance forms					
Day					
6- Number of study hours (total) / number of units (total)					
90 hour					
7- Name of the course administrator (if more than one name is mentioned)					
Name:- Prof. Dr:- Asmaa Ahmed Aziz , Email:- asmaa.jamal@tu.edu.iq					
8- Course objectives					
Objectives of the study subject			<ul style="list-style-type: none"> •Basic Concepts of Nuclear Physics •Basic Properties of Nuclei •Dynamic Properties of Nuclei •Nuclear Structure •Shell Model •Shell Model with Spin-Orbit Coupling •Nuclear Interactions • Elementary Particles in Nuclear Physics. 		
9- Teaching and learning strategies					
Strategy			Lecture style, discussing with students, and asking and exchanging questions with students		
10- Course Structure					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	3	Basic properties of the nucleus	Basic concepts	Lecture	Daily and monthly exams, assignments and reporting
Second	3	The nucleus of the mirror	Basic concepts	Lecture	Daily and monthly exams,

					assignments and reporting
Third	3	Some units used in nuclear physics	Basic concepts	Lecture	Daily and monthly exams, assignments and reporting
Fourth	3	Atomic mass unit	Atomic mass unit	Lecture	Daily and monthly exams, assignments and reporting
Fifth	3	Constant properties of the nucleus Constant properties of the nucleus	Constant properties of the nucleus	Lecture	Daily and monthly exams, assignments and reporting
Sixth	3	Nuclear stability study	Nuclear stability study	Lecture	Daily and monthly exams, assignments and reporting
Seventh	3	Kinetic properties of nuclei	Kinetic properties of nuclei	Lecture	Daily and monthly exams, assignments and reporting
Eighth	3	radioactivity	Assumptions of radioactivity	Lecture	Daily and monthly exams, assignments and reporting
Ninth	3	Assumptions of the Properties of different rays	Assumptions of the Properties of different rays	Lecture	Daily and monthly exams, assignments and reporting
Tenth	3	Knowing the nuclear properties of radiation	Knowing the nuclear properties of radiation	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	3	nuclear binding energy	nuclear binding energy	Lecture	Daily and monthly exams, assignments and reporting
Twelfth	3	Radioactive decay law	Radioactive decay law	Lecture	Daily and monthly exams, assignments and reporting
Thirteenth	3	Interaction of	Interaction of	Lecture	Daily and

		types of rays with matter	types of rays with matter		monthly exams, assignments and reporting
Fourteenth	3	Alpha and beta interactions with matter	Alpha and beta interactions with matter	Lecture	Daily and monthly exams, assignments and reporting
Fifteenth	3	Interactions of gamma rays and x-rays with matter	Interactions of gamma rays and x-rays with matter	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	3	Types of nuclear detectors	Types of nuclear detectors	Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	3	Learn about nuclear reactions	Learn about nuclear reactions	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	3	Nuclear fission and fusion	Nuclear fission and fusion	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	3	Nuclear reactors	Nuclear reactors	Lecture	Daily and monthly exams, assignments and reporting
Twentieth	3	Natural radioactive chains	Natural radioactive chains	Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	3	Ionizing and non-ionizing radiation	Ionizing and non-ionizing radiation	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	3	Nuclear models	the Compton effect Nuclear models	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	3	Liquid drop model	Liquid drop model	Lecture	Daily and monthly exams, assignments

					and reporting
Twenty-Four	3	nuclear shell model	nuclear shell model	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	3	Learn about uranium	Learn about uranium	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Six	3	Enriched and depleted uranium	Enriched and depleted uranium	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	3	Nuclear radiation hazards	Nuclear radiation hazards	Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	3	Basic rules for dealing with radiation	Basic rules for dealing with radiation	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	3	Nuclear elementary particles	Nuclear elementary particles	Lecture	Daily and monthly exams, assignments and reporting
Thirty¹	3	Classification of elementary particles	Classification of elementary particles	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Concepts in Nuclear physics
Main references (sources)	Concepts in Nuclear physics /
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	General physics websites

Course description form

1- Course name	
Quantum mechanics / fourth stage	
2- Course code / QUP014	
Bachelor's	
4- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
6- Number of study hours (total) / number of units (total)	
90 hour	
7- Name of the course administrator (if more than one name is mentioned)	
Name:- Assist. Prof. Dr:- Qahtan Nofan Abdullah , Email:- qahtan.nu@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	<ul style="list-style-type: none">• Learn about quantum mechanics.• Study the failures of classical physics in explaining some physical phenomena.• Study the wave function.• Study of operators influences• Study of the time-dependent and time-independent Schrödinger equation• Study the problem of a free particle and a particle confined in a potential well in one, two, and three dimensions• Harmonic oscillator• Study the issue of the hydrogen atom..• Angular momentum
9- Teaching and learning strategies	

Strategy	Lecture style, discussing with students, and asking and exchanging questions with students
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10- Course Structure

Week	Hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
First	3	Basic concepts	Classical physics	Lecture	Daily and monthly exams, assignments and reporting
Second	3	Basic concepts	Classical physics	Lecture	Daily and monthly exams, assignments and reporting
Third	3	Basic concepts	Classical physics	Lecture	Daily and monthly exams, assignments and reporting
Fourth	3	Learn about quantum mechanics	Introduction to quantum mechanics	Lecture	Daily and monthly exams, assignments and reporting
Fifth	3	Learn about quantum mechanics	Properties of the wave function Ψ	Lecture	Daily and monthly exams, assignments and reporting
Sixth	3	Learn about quantum mechanics	Time-dependent Schrödinger equation	Lecture	Daily and monthly exams, assignments and reporting
Seventh	3	Learn about quantum mechanics	Time-Independent Schrödinger equation	Lecture	Daily and monthly exams, assignments and reporting
Eighth	3	Identify the characteristics of operators	Substitutive and non-substitutive operators	Lecture	Daily and monthly exams, assignments and reporting
Ninth	3		Expected	Lecture	Daily and

		Learn about calculating physical observations	values		monthly exams, assignments and reporting
Tenth	3	Learn about calculating physical observations	Expected values	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	3	Herzberg's principle of inaccuracy	Learn about Herzberg's principle of inaccuracy	Lecture	Daily and monthly exams, assignments and reporting
Twelfth	3	The problem of a free particle and a particle trapped in a potential well	free particle	Lecture	Daily and monthly exams, assignments and reporting
Thirteenth	3	The problem of a free particle and a particle trapped in a potential well	a particle trapped in a potential well in 1-D	Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	3	The problem of a free particle and a particle trapped in a potential well	a particle trapped in a potential well in 2-D	Lecture	Daily and monthly exams, assignments and reporting
Fifteenth	3	The problem of a free particle and a particle trapped in a potential well	a particle trapped in a potential well in 3-D	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	3	Examples of a particle	Solved Examples	Lecture	Daily and monthly exams, assignments and reporting

		trapped in a potential well			
Seventeenth	3	Simple harmonic oscillator	Solution to the quantum harmonic oscillator problem	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	3	Simple harmonic oscillator	Solution to the quantum harmonic oscillator problem	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	3	Simple harmonic oscillator	Energy levels and wave functions of a quantum harmonic oscillator	Lecture	Daily and monthly exams, assignments and reporting
Twentieth	3	Simple harmonic oscillator	Energy levels and wave functions of a quantum harmonic oscillator	Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	3	Simple harmonic oscillator	normalization of the wave functions of the harmonic oscillator	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	3	Simple harmonic oscillator	Solve examples of quantum harmonic oscillator	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	3	Hydrogen atom	Spherically Symmetrical Potential	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	3	Hydrogen atom	Solution of the Differential Equations	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Five	3	Hydrogen atom	Three-variable	Lecture	Daily and monthly

			wave function		exams, assignments and reporting
Twenty-Six	3	Hydrogen atom	Structure of the hydrogen atom	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	3	Hydrogen atom	The diagonal function of the hydrogen atom and the overall wave function	Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	3	Hydrogen atom	electron spin	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	3	Hydrogen atom	Knowledge of basic quantum numbers	Lecture	Daily and monthly exams, assignments and reporting
Thirty †	3	Hydrogen atom	Knowledge of basic quantum numbers	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Introduction to quantum mechanics
Main references (sources)	Concepts in modern physics / written by Erth Pizer
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	General physics websites

Course description form

1- Course name					
Solid State physics / Fourth stage					
2- Course code					
Bachelor's					
3- Semester / year					
2025/2026					
4-Date of preparation of this description					
2025/9/3					
5- Available attendance forms					
Day					
6- Number of study hours (total) / number of units (total)					
90 hour					
7- Name of the course administrator (if more than one name is mentioned)					
Name:- Assist. Prof. Dr.Ayed N. Saleh , Email:- ayed.ns@tu.edu.iq					
8- Course objectives					
Objectives of the study subject			<ul style="list-style-type: none"> • Identify the nature of matter and the properties of molecules. 		
9- Teaching and learning strategies					
Strategy			Lecture style, discussing with students, and asking and exchanging questions with students		
10- Course Structure					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	3	Atomic structure	Basic concepts	Lecture	Daily and monthly exams, assignments and reporting
Second	3	periodic table	Basic concepts	Lecture	Daily and monthly exams, assignments and reporting
Third	3	Crystallography	geometric crystallography	Lecture	Daily and monthly exams, assignments

					and reporting
Fourth	3	Crystallography	Physical crystallography	Lecture	Daily and monthly exams, assignments and reporting
Fifth	3	Crystallography	Transitional vectors	Lecture	Daily and monthly exams, assignments and reporting
Sixth	3	Crystallography	Cell unit	Lecture	Daily and monthly exams, assignments and reporting
Seventh	3	Bonds	Material classification	Lecture	Daily and monthly exams, assignments and reporting
Eighth	3	Bonds	packing method	Lecture	Daily and monthly exams, assignments and reporting
Ninth	3	Bonds	Lattice energy	Lecture	Daily and monthly exams, assignments and reporting
Tenth	3	Bonds	Harmonious number	Lecture	Daily and monthly exams, assignments and reporting
Eleventh	3	X-ray diffraction	Generation of rays	Lecture	Daily and monthly exams, assignments and reporting
Twelfth	3	X-ray diffraction	Filters	Lecture	Daily and monthly exams, assignments and reporting
Thirteenth	3	X-ray diffraction	Barak's Law	Lecture	Daily and monthly exams, assignments and reporting
Fourteenth	3	X-ray diffraction	Experimental methods	Lecture	Daily and monthly

					exams, assignments and reporting
Fifteenth	3	X-ray diffraction	laue derivation	Lecture	Daily and monthly exams, assignments and reporting
Sixteenth	3	X-ray diffraction	Reciprocal lattice	Lecture	Daily and monthly exams, assignments and reporting
Seventeenth	3	X-ray diffraction	Engineering construction	Lecture	Daily and monthly exams, assignments and reporting
Eighteenth	3	Crystalline defects	Point defects	Lecture	Daily and monthly exams, assignments and reporting
Nineteenth	3	Crystalline defects	Lattice defects	Lecture	Daily and monthly exams, assignments and reporting
Twentieth	3	Crystalline defects	Diffusion	Lecture	Daily and monthly exams, assignments and reporting
Twenty-one	3	Crystalline defects	Fick's Law	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Two	3	lattice Vibrations	Sounic waves	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Three	3	lattice Vibrations	atomic vibrations	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Four	3	lattice Vibrations	Vibration modes	Lecture	Daily and monthly exams, assignments and reporting

Twenty-Five	3	Thermal properties	Classical theory	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Six	3	Thermal properties	Einstein's theory	Lecture	Daily and monthly exams, assignments and reporting
Twenty-Seven	3	Electrical properties	Classical theory	Lecture	Daily and monthly exams, assignments and reporting
Twenty-eight	3	Band Theory	Pierodic potential	Lecture	Daily and monthly exams, assignments and reporting
Twenty-nine	3	Semiconductor	Dopping of semiconductor	Lecture	Daily and monthly exams, assignments and reporting
Thirty ¹	3	Superconductivity	Superconductivity theory	Lecture	Daily and monthly exams, assignments and reporting

11- Course Evaluation

core for daily exams: 5, score for assignments and reports: 10, score for monthly exams: 35
Final exam score: 50

12- learning and Teaching Resources

Required textbooks (methodology, if any)	Solid State physics
Main references (sources)	Solid State physics / written by Yahaia N. Jamal
Recommended supporting books and references (scientific journals, reports...)	Nothing
Electronic references, Internet sites	General physics websites

Course description form

1- Course name	
Observation and Application / Stage Four	
2- Course code / PRC 004	
Bachelor's	
3- Semester / year	
2025/2026	
4-Date of preparation of this description	
2025/9/3	
5- Available attendance forms	
Day	
6- Number of study hours (total) / number of units (total)	
90 hour	
7- Name of the course administrator (if more than one name is mentioned)	
Name:- Assistant Ahmed Taleb Sabar , Email:- Ahmed.s.m.j@tu.edu.iq	
8- Course objectives	
Objectives of the study subject	Preparing students for the teaching profession and familiarizing them with the school environment. <ul style="list-style-type: none">• Developing educational planning skills and the ability to create daily lesson plans.• Studying classroom management techniques and student interaction strategies.• Studying methods for teaching pure sciences and their laboratory applications.• Developing skills in formulating behavioral objectives (cognitive, affective, and psychomotor).• Studying assessment, measurement, and school testing methods.• Practical training in delivering scientific lectures in middle and high schools.
9- Teaching and learning strategies	
Strategy	Strategy: The method of lecturing and discussing with students, raising and discussing educational questions, in addition to field observation and direct practical application in schools.

10- Course Structure					
Week	Hours	Name of the unit or topic	Required learning outcomes	Learning method	Evaluation method
First	3	Basic concepts	The concept and objectives of observation Teaching	Lecture and Visit	Reports and Records
Second	3	application Understanding the teacher's role	The successful teacher and their educational qualities	Field Observation	Observation
Third	3	Understanding the school system	Teacher and school administration records	Viewing	Log Observation Log Plan
Fourth	3	Lesson planning	Preparing annual and daily lesson plans	Lecture and Application	Discussion
February 19th and beyond		Practical field	practice in schools	Live	Supervisors and Manager
After 45 days		Disengagement from school	On-the-job training in the university's academic department	Teaching Discussion Sessions	Evaluation Final Report

11- Course Evaluation

Academic Supervisor's Mark: 30

- Educational Supervisor's Mark: 30
- Subject Teacher's Mark (Cooperating Teacher): 30
- School Principal's Mark: 10
- Final Total: 100 Marks

12- learning and Teaching Resources

Required textbooks:	Practical Education Guide for Students of Colleges of Education.
Main references:	Curricula of the Iraqi Ministry of Education (by specialization).
Supporting books and references:	Books on methods of teaching general and specialized sciences.
Electronic references:	Iraqi Ministry of Education platforms and educational websites.