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

Academic Program and Course Description Guide

2026

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

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

Concepts and terminology:

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

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

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

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

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

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

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

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

Academic Program Description Form

University Name: ..Tikrit university

Faculty/Institute: ...sciences college

Scientific Department: .Physics department

Academic or Professional Program Name: Physics Science

Final Certificate Name: . Bachelor's degree in Physics Science

Academic System: Bologna system

Description Preparation Date: 1/9/2025

File Completion Date: 18/3/2026

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 1/4/2025

Signature:

Approval of the Dean

1. Program Vision

The College of Science seeks to be one of the leading higher education institutions at Tikrit University in the field of modern education and scientific research through its scientific, research and administrative activities. It also works to provide an integrated path for its students and professors to make them active and creative in serving the community in the fields of teaching physics and its various branches.

2. Program Mission

To prepare and graduate pioneering scientific and leadership competencies in the fields of physics and its branches, and to develop the knowledge base in the field of scientific research to serve the local, regional, and international communities, in addition to training and refining students' minds scientifically and cognitively, emphasizing social and cultural values, and responding to the requirements of the local market.

3. Program Objectives

1. Embodying the vision, mission, and goals of Tikrit University, and implementing best educational practices with a focus on ensuring and enhancing quality and performance.
2. Preparing specialized personnel capable of serving the community and preparing for future specializations.
3. Disseminating a culture of scientific diversity in society, transferring knowledge and scientific skills, writing academic research, and achieving creative scientific achievement through activities focused on students and faculty.
4. The college seeks to conclude scientific and cultural cooperation agreements with similar colleges and departments within various colleges to achieve best practices in the fields of teaching and learning.
5. Focusing on the educational and ethical aspects of all its members, instilling a spirit of dedication, tolerance, commitment, and work in the service of the nation.
6. Focusing on intellectual and cultural development through openness to the experiences of other countries in the fields of languages, literature, and translation.
7. Focusing on the educational and ethical aspects of students, instilling a spirit of dedication, tolerance, and commitment.

4. Program Accreditation

Nothing

5. Other external influences

Nothing

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	2	5	week	
College Requirements	2	5	week	
Department Requirements	2	5	week	
Summer Training	Nothing			
Other	Nothing			

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2025-2026/level (UGII)	PHY23013	Atomic Physics	3hr theoretical	2 hr practical

8. Expected learning outcomes of the program

Knowledge

- The student innovates solutions and explanations for physical phenomena with some modernity and creativity.
- The student knows the concept of practical physics and adapts to solving problems.
- The student designs a plan to study physical vocabulary in a new way.
- Enabling students to analyze reality from a physical perspective.

Skills
• The student will develop innovative and creative solutions and explanations for physical phenomena. • The student will gain a grasp of the concept of practical physics and be able to solve problems. • The student will design a plan to study physical vocabulary using a new approach. • The student will be able to analyze reality from a physical perspective.
Ethics
• To classify the needs for developing practical physics. • To become accustomed to applying the rules learned in speech, actions, and the interpretation of phenomena. • To positively criticize improper uses of devices based on physics. • To accurately retrieve the information studied and verify it practically. • To decipher the unknown by analogy with the known equivalent. • To be familiar with physical terms and their meanings.

9. Teaching and Learning Strategies

The learning and teaching strategy is designed to: Carefully cover in lectures the necessary fundamental material and analytical techniques, and demonstrate concepts with appropriate (and, where possible practical) examples. Allow students adequate time to practice the techniques using a large number of carefully selected tutorial problems

10. Evaluation methods

1. Monthly exams.
2. Daily exams.
3. Oral questions during lecture time based on brainstorming.
4. Reports.

11. Faculty

Lect.Dr. Sukaina Iskandar Yusuf

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Lecture	Physics	Solid state			Staff	

Professional Development

Mentoring new faculty members

Professional development of faculty members

12. **Acceptance Criterion**
(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. **The most important sources of information about the program**
State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline																	
				Required program Learning outcomes													
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics					
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4		
2025-2026/level (UGII)	PHY23013	Atomic Physics	Basic	*					*					*			

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

Course Description Form

1. Course Name:
Atomic Physics
2. Course Code:
PHY23013
3. Semester / Year:
Semester Three
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
Available Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Number of Credit Hours (Total)=150hr Number of Units (Total) = 60 unit
7. Course administrator's name (mention all, if more than one name)
Name: **Lect.Dr. Sukaina Iskandar Yusuf** Email: Sokayna.e.yussuf@tu.edu.iq
8. Course Objectives

Course Objectives	□ Working on developing the quality of basic university education. □ Preparing human cadres capable of dealing with academic scientific research methods and applications. □ Preparing efficient cadres to meet the needs of educational institutions. □ Providing qualified cadres in response to the needs of the environment surrounding the university. □ Interacting with the community and providing professional scientific services and consultations. □ Exchanging experiences and competencies with similar colleges and research centers. □ Bringing the student to the level that qualifies him postgraduate studies to pursue research and developn in physics.

9. Teaching and Learning Strategies	
Strategy	The learning and teaching strategy is designed to: Carefully cover in lectures the necess fundamental material and analytical techniques, and demonstrate concepts with appropr (and, where possible practical) examples. Allow students adequate time to practice techniques using a large number of carefully selected tutorial problems

10. Course Structure	
	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
Week 1	**The Quantum Theory Of Light** The nature of light and electromagnetic radiation, Thermal Radiation, Emission and Absorption of Radiation, Blackbody radiation, Blackbody radiation Spectrum.
Week 2	Wien's distribution law, Rayleigh-Jeans' law, Home Work, Planck's Law of Radiation, Derivation Wien's law from Planck's law , Derivation of Rayleigh-Jeans' law from Planck's law, Derivation of Stefan's Law from the Planck Distribution, Photoelectric Effect,
Week 3	Einstein's interpretation of photoelectric effect, Applications of Photoelectric effect, Home Works,
Week 4	**The Particle Nature of Matter** The Composition Of Atoms, Faraday's electrolysis experiment, Thomson's model of the atom.
Week 5	Rutherford's Model of the Atom, Millikan's Value of the Elementary Charge, Home works.
Week 6	**Monthly Exam.**
Week 7	The Bohr Atom, Spectral Series, Bohr's Quantum Model of the Atom, Energy levels and spectra.
Week 8	Atomic excitation: The Franck–Hertz Experiment, Bohr's Correspondence Principle,
Week 9	**MATTER WAVES** De Broglie hypothesis, De Broglie wavelength, De Broglie wave velocity, Phase and group velocities, The Heisenberg uncertainty principle, Electron diffraction, neutron diffraction.
Week 10	**QUANTUM MECHANICS IN ONE DIMENSION** Introduction, Wave function for a free particle, Schrödinger equation: Time dependent form, Schrödinger equation: steady-state form, The particle in a box: energy quantization. Harmonic oscillator. The Harmonic oscillator: solution of Schrödinger's equation, Home works
Week 11	Expectation Values, Observable , Operators, Operator equation, Operator's properties, Example 1, Example2, Home works. Eigen value equation, Example 1, Example2, Home works, Quantum Uncertainty and the Eigenvalue Property.
Week 12	**TUNNELING PHENOMENA** The Square Barrier, Barrier Penetration: Some Applications, Field Emission, Ammonia Inversion, Decay of Black Holes
Week 13	**Atomic Structure** Orbital Magnetism and the Normal Zeeman Effect, The Spinning electron,
Week 14	The spin–orbit interaction and other magnetic effect, Exchange Symmetry and the Exclusion Principle, The Periodic Table.
Week 15	**Monthly Exam**

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي العملي	
	Material Covered
Week 1	Photoelectric effect experiment
Week 2	Daily exam and discussion reports
Week 3	Experiment with the visible spectrum of the hydrogen atom
Week 4	Daily exam and discussion reports
Week 5	Rydberg constant mapping experiment.
Week 6	Daily exam and discussion reports
Week 7	Field visit to laboratories in other colleges
Week 8	Monthly exam.
Week 9	Frank-Hertz experiment
Week 10	Daily exam and discussion reports
Week 11	Schuster's method to find the specific charge of the electron e/m
Week 12	Daily exam and discussion reports
Week 13	Stefan Boltzmann's radiation law experiment
Week 14	Electron diffraction experiment
Week 15	**Monthly Exam**

11. Module Evaluation

تقييم المادة الدراسية

		Time (hr)	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	10% (10)		
	Assignments	2	5 % (5)		
	Lab	6	15% (15)		
	Tut.	2	5% (5)		
	Rating of discussions and seminars	2	5% (5)		
Summative assessment	**Midterm Exam**	2	10% (10)		
	Final Exam	3	50% (50)		
Total assessment			100% (100 Marks)		

12. Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Modern Physics (V H Satheeshkumar) 2. Atomic Physics 1st and 2nd . 3. Modern Physics 3rd (Raymond A. Serway) 4. Models of the Atomic Nucleus 2nd (Norman D. Cook)	yes
Recommended Texts	1. Solid State Physics 1st (Yahya Nouri Al-Jamal) 2. Solid State Physics 2nd (Yahya Nouri Al-Jamal) 3. Articles from internet about the subjects	yes
Websites	https://www.academia.edu/ https://www.researchgate.net/ https://scholar.google.com/	

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Academic or Professional Program Name: Physics Science

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Description Preparation Date: 1/9/2025

File Completion Date: 18/3/2026

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 18/3/25

Signature: Ekhlas

Approval of the Dean

Approval of the Dean

1. Program Vision

The College of Science seeks to be one of the leading higher education institutions at Tikrit University in the field of modern education and scientific research through its scientific, research and administrative activities. It also works to provide an integrated path for its students and professors to make them active and creative in serving society in the fields of natural sciences (Biology sciences - chemistry - Physics - Earth sciences) and its teaching.

2. Program Mission

Working to prepare and graduate leading scientific and leadership competencies in the natural sciences, scientific research and literature, and to develop the balance of knowledge in the field of scientific research to serve the local, regional and international community, as well as training and refining the minds of students scientifically and cognitively, and emphasizing social and cultural values and responding to the requirements of the local market.

3. Program Objectives

1. Embodying the vision, mission and goals of Tikrit University, and applying the best educational practices with a focus on ensuring and enhancing quality and performance.
2. Preparing specialized cadres capable of serving the community and preparing for the preparation of future specializations.
3. Spreading the culture of human diversity in society, transferring scientific knowledge and skills, writing academic research, and creative scientific achievement through student- and teaching-focused activities.
4. The college seeks to conclude scientific and cultural cooperation agreements with corresponding colleges and corresponding departments in different colleges to achieve best practices in the fields of teaching, learning and translation.
5. Focusing on the educational and moral aspects of all its members and spreading the spirit of dedication, tolerance, commitment and work to serve the nation.
6. Paying attention to intellectual and cultural construction through openness to the experiences of other countries in the fields of natural sciences in its various departments, as well as scientific research.

4. Program Accreditation

nothing

5. Other external influences

nothing

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	40	2		Basic course
College Requirements	Yes			
Department Requirements	Yes			
Summer Training	Yes			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2025-2026 / year 2	PHY 213	Analysis Mechanics	theoretical	
			3	

8. Expected learning outcomes of the program

Knowledge

1- The student's ability to classify needs to develop theoretical and practical reality in the subject of Analysis Mechanics.
2- To get used to practicing the rules and scientific studies he has learned in his life and daily work.
3- To positively criticize the improper use of devices and components related to Mechanics devices.
4- To recall the information he studied carefully and verify it practically in order to find appropriate solutions to the related problems
Mechanics scientific materials and equipment.
5- To decipher the unknown by measuring the known counterpart using accurate measuring devices.
6- To take note of visual physics terms and their meanings, which helps the student's development in the future?

Skills

1 - The student should devise solutions and explain some of the problems related to the sciences of Analysis Mechanics and related devices
Modernity and creativity.
2 - The student's knowledge of the concept of theoretical physics of optics and adaptation to overcome obstacles in
this field .
3 - The student will design a plan to study the vocabulary of the subject of physical Analysis Mechanics in a new and accurate manner through...
Building a solid academic base for the student at the beginning of his university studies on which he can rely when trying to develop himself in this way
the field.
4- Enabling students to analyze reality and phenomena from an accurate scientific physical perspective.

Ethics

1- Reception
At this level, the student shows interest in the subject of physical Analysis Mechanics and its study, and the learning outcomes range from simple awareness to interest, to acceptance, then innovation and creativity.
2- Response
Here the student's level of interest goes beyond participation, so that he takes a position on the subject of study.
3- Value judgment
Here the student moves to a higher level by giving value to the subject, a value that has an impact on the student's personality.
4- Value organization
It means building a value system for the student based on comparison, linking, and grouping, so that the learner forms his own concepts related to value.
5- Normalization or labeling with value
It is the highest level where value is formed as a characteristic that distinguishes the student from others and influences his behavior, through which he can develop his lifestyle.

9. Teaching and Learning Strategies

1- How to deliver in-person lectures after publishing them on the class's Classroom website.
2- Display some pictures and shapes related to the lecture using PowerPoint.
3- Use some simulation programs to explain the lecture in more scientific and clear ways.
4- Using three-dimensional educational clips through YouTube programs, which help the student visualize the devices Visual images and their installation through this software.

10. Evaluation methods

1- Monthly exams.
2- Daily exams (Quiz).
3- Oral questions during lecture time with homework.
4- End of course exams

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof.	Physics	Analysis Mechanics			Staff	

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

1) الميكانيك التحليلي تاليف كرانت ر. فاولس – جامعة يوتا – ترجمة طالب ناهي الخفاجي
2) Grant R. Fowles – second Edition – 1970
3)Thornton S.T. and Marion J.B. (2003), Classical Dynamics of Particles and Systems (5th edition), Tomson, ISBN 0-534-40896-6 (UL: 531.11MAR)

14. Program Development Plan

1- Using the latest sources and including topics that are consistent with modernity, the requirements of scientific and practical life, and what scientists have reached, on an ongoing basis.

2- Introducing advanced scientific equipment into the physical optics laboratory to carry out scientific experiments in the laboratory, which enhances the student's ability to understand the sciences of physical and engineering optics.

Program Skills Outline													
				Required program Learning outcomes									
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2025-2026	PHY314		Basic	—				—				—			

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

Course Description Form Analysis Mechanics

Module Information معلومات المادة الدراسية			
PHY 213	الميكانيك التحليلي Analysis Mechanics		**UGII**
Module Level	Three	**Semester (s) offered**	I
Administering Department	**Physics**	**College**	Science
Module Leader	Dr. Abdulsamee Fawzi Abdul Aziz	**e-mail**	Abdulsamee_fawzi@tu.edu.iq
Module Leader's Acad. Title	Lecture	**Module Leader's Qualification**	Ph.D.

Module Aims, Learning Outcomes, Indicative Contents and Brief Description أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر	
Module Aims أهداف المادة الدراسية	Our interest in mechanics arises from its general applicability to a vast number of familiar phenomena. This module provides meaningful and easily visualizable problems which allow development of the skills of problem solving, required in all the fields of physics. It provides the necessary background to later modules that will apply the principles of mechanics to the solution of more complex problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A student who has passed this module should be able to: Module Specific Skills and Knowledge:recognise and describe the forces that are relevant in a given mechanics situation; describe the origin of and relationship between these forces, and to describe what their consequences will be; solve a range of mechanics problems as defined by the syllabus below, and by examples given in the lectures and worksheets;
Course Description	describe the origin of and relationship between these forces, and to describe what their consequences will be; solve a range of mechanics problems as defined by the syllabus below, and by examples given in the lectures and worksheets; Discipline Specific Skills and Knowledge: apply general problem-solving strategies not only to mechanics but also to the solution of other physics problems; demonstrate a knowledge of mechanics that will be applicable in a range of other physics modules; use vector notation consistently and correctly as an integral part of solving problems; use symbols that represent the numerical value and units of the physical quantities, and manipulate/evaluate expressions involving such symbols in

	a precise and consistent manner; Personal and Key Transferable / Employment Skills and Knowledge: undertake guided self-study successfully; develop appropriate time-management strategies and meet deadlines for completion of work.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1-Develop methods and means of obtaining information related to Magnetoelectric 2-Developing the student's personality to become a constructive personality that possesses scientific dialogue. 3- Encourage students to request information from websites and libraries.

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Domain of applicability of Newtons laws – Newtons laws – Types of forces
Week 2	Applications :- Motion of a single state Rocket – system of pulleys
Week 3	Conservation laws, elementary rotational motion – Angular momentum
Week 4	Energy and power – From dynamics to statics
Week 5	Rigid body rotation – Rolling without slipping – illustrative problems
Week 6	Illustrations of netwtons laws – Free fall of a balloon in a resistive medium
Week 7	First Exam.
Week 8	Rotating sphere – Gravitational potential inside a spherical shell
Week 9	Holonomic constraints – Non holonomic constraints – degrees of freedom
Week 10	Virtual work – D Alembert,s principle – Illustrative problem
Week 11	Velocity dependent potentials – velocity dependent potentials –Dissipative force
Week 12	Kinetic energy – illustrative problems – Charaged particle in uniform magnetic field
Week 13	Variational principle of mechanics :- Calculus of variation – one dimensional problem brachistocrone problem – problems.
Week 14	Motion in central potential – general properties – properties of conic section – Apses and A psidal distances – problems.
Week 15	Second Exam.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text
Required Texts	3) الميكانيك التحليلي تاليف كرانت ر. فاولس – جامعة يوتا – ترجمة طالب ناهي الخفاجي 4) Grant R. Fowles – second Edition – 1970 5) Thornton S.T. and Marion J.B. (2003), Classical Dynamics of

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1. Embodying the vision, mission and goals of Tikrit University, and applying the best educational practices with a focus on ensuring and enhancing quality and performance.
2. Preparing specialized cadres capable of serving the community and preparing for the preparation of future specializations.
3. Spreading the culture of human diversity in society, transferring scientific knowledge and skills, writing academic research, and creative scientific achievement through student- and teaching-focused activities.
4. The college seeks to conclude scientific and cultural cooperation agreements with corresponding colleges and corresponding departments in different colleges to achieve best practices in the fields of teaching, learning and translation.
5. Focusing on the educational and moral aspects of all its members and spreading the spirit of dedication, tolerance, commitment and work to serve the nation.
6. Paying attention to intellectual and cultural construction through openness to the experiences of other countries in the fields of natural sciences in its various departments, as well as scientific research.

4. Program Accreditation

nothing

5. Other external influences

nothing

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	40	2		Basic course
College Requirements	Yes			
Department Requirements	Yes			
Summer Training	Yes			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2025-2024 / year 2	PHY 213	Analysis Mechanics	theoretical	
			3	

8. Expected learning outcomes of the program

Knowledge

1- The student's ability to classify needs to develop theoretical and practical reality in the subject of Analysis Mechanics.
2- To get used to practicing the rules and scientific studies he has learned in his life and daily work.
3- To positively criticize the improper use of devices and components related to Mechanics devices.
4- To recall the information he studied carefully and verify it practically in order to find appropriate solutions to the related problems
Mechanics scientific materials and equipment.
5- To decipher the unknown by measuring the known counterpart using accurate measuring devices.
6- To take note of visual physics terms and their meanings, which helps the student's development in the future?

Academic Program Description Form

University Name: ..Tikrit university

Faculty/Institute: ...sciences college

Scientific Department: .Physics department

Academic or Professional Program Name: Physics Science

Final Certificate Name: . Bachelor's degree in Physics Science

Academic System: Bologna system

Description Preparation Date: 1/9/2025

File Completion Date: 18/3/2026

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 1/9/2025

Signature:

Approval of the Dean

Skills
1 - The student should devise solutions and explain some of the problems related to the sciences of Analysis Mechanics and related devices Modernity and creativity. 2 - The student's knowledge of the concept of theoretical physics of optics and adaptation to overcome obstacles in this field . 3 - The student will design a plan to study the vocabulary of the subject of physical Analysis Mechanics in a new and accurate manner through... Building a solid academic base for the student at the beginning of his university studies on which he can rely when trying to develop himself in this way the field. 4- Enabling students to analyze reality and phenomena from an accurate scientific physical perspective.
Ethics
1- Reception At this level, the student shows interest in the subject of physical Analysis Mechanics and its study, and the learning outcomes range from simple awareness to interest, to acceptance, then innovation and creativity. 2- Response Here the student's level of interest goes beyond participation, so that he takes a position on the subject of study. 3- Value judgment Here the student moves to a higher level by giving value to the subject, a value that has an impact on the student's personality. 4- Value organization It means building a value system for the student based on comparison, linking, and grouping, so that the learner forms his own concepts related to value. 5- Normalization or labeling with value It is the highest level where value is formed as a characteristic that distinguishes the student from others and influences his behavior, through which he can develop his lifestyle.

9. Teaching and Learning Strategies

1- How to deliver in-person lectures after publishing them on the class's Classroom website.
2- Display some pictures and shapes related to the lecture using PowerPoint.
3- Use some simulation programs to explain the lecture in more scientific and clear ways.
4- Using three-dimensional educational clips through YouTube programs, which help the student visualize the devices Visual images and their installation through this software.

10. Evaluation methods

1- Monthly exams.
2- Daily exams (Quiz).
3- Oral questions during lecture time with homework.
4- End of course exams

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof.	Physics	Analysis Mechanics			Staff	

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13.	**The most important sources of information about the program**

1) الميكانيك التحليلي تاليف كرانت ر. فاولس – جامعة يوتا – ترجمة طالب ناهي الخفاجي
2) Grant R. Fowles – second Edition – 1970
3)Thornton S.T. and Marion J.B. (2003), Classical Dynamics of Particles and Systems (5th edition), Tomson, ISBN 0-534-40896-6 (UL: 531.11MAR)

14.	Program Development Plan

1- Using the latest sources and including topics that are consistent with modernity, the requirements of scientific and practical life, and what scientists have reached, on an ongoing basis.
2- Introducing advanced scientific equipment into the physical optics laboratory to carry out scientific experiments in the laboratory, which enhances the student's ability to understand the sciences of physical and engineering optics.

Program Skills Outline														
				Required program Learning outcomes										
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics		
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2025-2026	PHY314		Basic	—				—				—			

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

Course Description Form Analysis Mechanics

Module Information معلومات المادة الدراسية				
PHY 213	الميكانيك التحليلي Analysis Mechanics		UGII	
Module Level	Three	**Semester (s) offered**	I	
Administering Department	**Physics**	**College**	Science	
Module Leader	Dr. Abdulsamee Fawzi Abdul Aziz	**e-mail**	Abdulsamee_fawzi@tu.edu.iq	
Module Leader's Acad. Title	Lecture	**Module Leader's Qualification**	Ph.D.	

Module Aims, Learning Outcomes, Indicative Contents and Brief Description أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر	
Module Aims أهداف المادة الدراسية	Our interest in mechanics arises from its general applicability to a vast number of familiar phenomena. This module provides meaningful and easily visualizable problems which allow development of the skills of problem solving, required in all the fields of physics. It provides the necessary background to later modules that will apply the principles of mechanics to the solution of more complex problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A student who has passed this module should be able to: Module Specific Skills and Knowledge:recognise and describe the forces that are relevant in a given mechanics situation; describe the origin of and relationship between these forces, and to describe what their consequences will be; solve a range of mechanics problems as defined by the syllabus below, and by examples given in the lectures and worksheets;
Course Description	describe the origin of and relationship between these forces, and to describe what their consequences will be; solve a range of mechanics problems as defined by the syllabus below, and by examples given in the lectures and worksheets; Discipline Specific Skills and Knowledge: apply general problem-solving strategies not only to mechanics but also to the solution of other physics problems; demonstrate a knowledge of mechanics that will be applicable in a range of other physics modules; use vector notation consistently and correctly as an integral part of solving problems; use symbols that represent the numerical value and units of the physical quantities, and manipulate/evaluate expressions involving such symbols in

	a precise and consistent manner; Personal and Key Transferable / Employment Skills and Knowledge: undertake guided self-study successfully; develop appropriate time-management strategies and meet deadlines for completion of work.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1-Develop methods and means of obtaining information related to Magnetoelectric 2-Developing the student's personality to become a constructive personality that possesses scientific dialogue. 3- Encourage students to request information from websites and libraries.

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Domain of applicability of Newtons laws – Newtons laws – Types of forces
Week 2	Applications :- Motion of a single state Rocket – system of pulleys
Week 3	Conservation laws, elementary rotational motion – Angular momentum
Week 4	Energy and power – From dynamics to statics
Week 5	Rigid body rotation – Rolling without slipping – illustrative problems
Week 6	Illustrations of netwtons laws – Free fall of a balloon in a resistive medium
Week 7	First Exam.
Week 8	Rotating sphere – Gravitational potential inside a spherical shell
Week 9	Holonomic constraints – Non holonomic constraints – degrees of freedom
Week 10	Virtual work – D Alembert,s principle – Illustrative problem
Week 11	Velocity dependent potentials – velocity dependent potentials –Dissipative force
Week 12	Kinetic energy – illustrative problems – Charaged particle in uniform magnetic field
Week 13	Variational principle of mechanics :- Calculus of variation – one dimensional problem brachistocrone problem – problems.
Week 14	Motion in central potential – general properties – properties of conic section – Apses and A psidal distances – problems.
Week 15	Second Exam.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text
Required Texts	3) الميكانيك التحليلي تاليف كرانت ر. فاولس – جامعة يوتا – ترجمة طالب ناهي الخفاجي 4) Grant R. Fowles – second Edition – 1970 5) Thornton S.T. and Marion J.B. (2003), Classical Dynamics of

	Particles and Systems (5th edition), Tomson, ISBN 0-534-40896-6 (UL: 531.11MAR)

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

Academic Program and Course Description Guide

2026

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

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

Concepts and terminology:

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

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

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

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

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

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

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

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

Academic Program Description Form

University Name: ..Tikrit university

Faculty/Institute: ...sciences college

Scientific Department: .Physics department

Academic or Professional Program Name: Physics Science

Final Certificate Name: . Bachelor's degree in Physics Science

Academic System: Bologna system

Description Preparation Date: 1/9/2025

File Completion Date: 18/3/2026

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 1/9/2025

Signature: Ekhlas

Approval of the Dean

Approval of the Dean

1. Program Vision

The College of Science seeks to be one of the leading higher education institutions at Tikrit University in the field of modern education and scientific research through its scientific, research and administrative activities. It also works to provide an integrated path for its students and professors to make them active and creative in serving society in the fields of natural sciences (Biology sciences - chemistry - Physics - Earth sciences) and its teaching.

2. Program Mission

Working to prepare and graduate leading scientific and leadership competencies in the natural sciences, scientific research and literature, and to develop the balance of knowledge in the field of scientific research to serve the local, regional and international community, as well as training and refining the minds of students scientifically and cognitively, and emphasizing social and cultural values and responding to the requirements of the local market.

3. Program Objectives

1. Embodying the vision, mission and goals of Tikrit University, and applying the best educational practices with a focus on ensuring and enhancing quality and performance.
2. Preparing specialized cadres capable of serving the community and preparing for the preparation of future specializations.
3. Spreading the culture of human diversity in society, transferring scientific knowledge and skills, writing academic research, and creative scientific achievement through student- and teaching-focused activities.
4. The college seeks to conclude scientific and cultural cooperation agreements with corresponding colleges and corresponding departments in different colleges to achieve best practices in the fields of teaching, learning and translation.
5. Focusing on the educational and moral aspects of all its members and spreading the spirit of dedication, tolerance, commitment and work to serve the nation.
6. Paying attention to intellectual and cultural construction through openness to the experiences of other countries in the fields of natural sciences in its various departments, as well as scientific research.

4. Program Accreditation

nothing

5. Other external influences

nothing

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	30	2		Basic course
College Requirements	Yes			
Department Requirements	Yes			
Summer Training	Yes			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2025-2026 / year 1	PHY1102	electricity laboratory	theoretical	practical
			2	2

8. Expected learning outcomes of the program

Knowledge

1- The student's ability to classify needs to develop theoretical and practical reality in the subject of electricity.
2- To get used to practicing the rules and scientific studies he has learned in his life and daily work.
3- To positively criticize the improper use of devices and components related to devices.
4- To recall the information he studied carefully and verify it practically in order to find appropriate solutions to the related problems electric scientific materials and equipment.
5- To decipher the unknown by measuring the known counterpart using accurate measuring devices.
6- To take note of visual physics terms and their meanings, which helps the student's development in the future?

Skills

1 - The student should devise solutions and explain some of the problems related to the sciences of physics and related devices
Modernity and creativity.
2 - The student's knowledge of the concept of theoretical and practical physics of optics and adaptation to overcome obstacles in
this field .
3 - The student will design a plan to study the vocabulary of the subject of physical in a new and accurate manner through...
Building a solid academic base for the student at the beginning of his university studies on which he can rely when trying to develop himself in this way
the field.
4- Enabling students to analyze reality and phenomena from an accurate scientific physical perspective.

Ethics

1- Reception
At this level, the student shows interest in the subject of physical and its study, and the learning outcomes range from simple awareness to interest, to acceptance, then innovation and creativity.
2- Response
Here the student's level of interest goes beyond participation, so that he takes a position on the subject of study.
3- Value judgment
Here the student moves to a higher level by giving value to the subject, a value that has an impact on the student's personality.
4- Value organization
It means building a value system for the student based on comparison, linking, and grouping, so that the learner forms his own concepts related to value.
5- Normalization or labeling with value
It is the highest level where value is formed as a characteristic that distinguishes the student from others and influences his behavior, through which he can develop his lifestyle.

9. Teaching and Learning Strategies

1- How to deliver in-person lectures after publishing them on the class's Classroom website.
2- Display some pictures and shapes related to the lecture using PowerPoint.
3- Use some simulation programs to explain the lecture in more scientific and clear ways.
4- Using three-dimensional educational clips through YouTube programs, which help the student visualize the devices Visual images and their installation through this software.

10. Evaluation methods

1- Monthly exams.

2- Daily exams (Quiz).
3- Oral questions during lecture time with homework.
4- End of course exams

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

14. Program Development Plan
1- Using the latest sources and including topics that are consistent with modernity, the requirements of scientific and practical life, and what scientists have reached, on an ongoing basis. **2- Introducing advanced scientific equipment into the physical electricity laboratory to carry out scientific experiments in the laboratory, which enhances the student's ability to understand the sciences of physical and engineering optics.**

Program Skills Outline														
				Required program Learning outcomes										
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics		
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2025-2026	PHY128	electricity laboratory	Basic	—				—				—			

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

Course Description Form

1. Course Name:
electricity laboratory
2. Course Code:
PHY1102
3. Semester / Year:
First Semester / year 1
4. Description Preparation Date:
: 01/ 10/ 2025
5. Available Attendance Forms:
Attendance Only
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours per semester. 2 hours a week
7. Course administrator's name (mention all, if more than one name)
Name: Othman khalf zidane Thuraya yarb sabri Aida Abd mazhar
8. Course Objectives
1- Conveying a general idea about the subject of electricity and the importance of this cours physics departments. It is done through **Teaching the subject of electricity provides students with some skills about the basics principles of electric, electricity devices and the parts that are composed of them, know their types and shapes, how they work, and connecting their electrical circuits. Which ma students familiar with the most important topics that they may encounter in daily practical by dealing with lenses, gratings, single-wavelength sources, interference and diffraction of various types, methods of operation and their importance? In addition to teaching the stud to use highly relevant measuring devices Falling light.** **2- Preparing competent and specialized staff in the field of optics and optical devices in various forms Iraq.**
9. Teaching and Learning Strategies
1- Educational strategy, collaborative concept planning. **2- Brainstorming education strategy.** 1- **Education Strategy Notes Series.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 hours		Introducing the student to electrical laboratory - explain public safety.	1- In-person and electronic lectures 2- Display some pictures and shapes related to the lecture on the PPT program. 3- Using some simulation programs to explain the lecture in more scientific and clear ways	Weekly, monthly, daily, written exams, and the end-of-year exam.
2	2 hours		Introducing the student to the electrical laboratory - explaining public safety		
3	2 hours		Explanation of the use of measuring devices related to electrical voltage currents – resistors		
4	2 hours		Electrical resistance experiment		
5	2 hours		fulfillment of Ohm's law		
6	2 hours		Daily exam and discussion reports		
7	2 hours		Monthly exam		
8	2 hours		Connect electrical resistors in series		
9	2 hours		Connect electrical resistors in paral		
10	2 hours		Connecting mixed electrical resisto		
11	2 hours		Discussion reports		
12	2 hours		Daily exam		
13	2 hours		Reviewing weekly reports with students		
14	2 hours		Review all experiments before the monthly exam		
15	2 hours		Monthly exam		

11. Course Evaluation

Distribution as follows: 25 marks for monthly and daily exams and homework for the first month. 25 marks for monthly and daily exams and homework for the second month. 50 marks for final exams.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	اساسيات الكهربائية والمغناطسية / يحيى عبدالحميد الحاج علي, دار الكتب للنشر والطباعة,الموصل, **2000**
Main references (sources)	**1990."الكهربائية والمغناطيسية"د.طالب ناهي الخفاجي,**
Recommended books and references (scientific journals, reports…)	**1-William H. Hayt,"Engineering lectromagnatics"6th edition, 2001.** **2-R.A.Serway,J.W.Jewett,"physics for Scintists and Engineering,6th edition, Thomson Books,2004.** **3.David Halliday and Robert Resnick, physics part 1&part 2,3rd edition,1978**
Electronic References, Websites	**Iraqi virtual electronic library,** **Sources of physical electric from the Internet**

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

Academic Program and Course Description Guide

2026

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

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Concepts and terminology:

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

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

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

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

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

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

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

Academic Program Description Form

University Name: ..Tikrit university

Faculty/Institute: ...sciences college

Scientific Department: .Physics department

Academic or Professional Program Name: Physics Science

Final Certificate Name: . Bachelor's degree in Physics Science

Academic System: Bologna system

Description Preparation Date: 1/9/2025

File Completion Date: 18/3/2026

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 1/4/2025

Signature:

Approval of the Dean

1. Program Vision

The College of Science seeks to be one of the leading higher education institutions at Tikrit University in the field of modern education and scientific research through its scientific, research and administrative activities. It also works to provide an integrated path for its students and professors to make them active and creative in serving the community in the fields of teaching physics and its various branches.

2. Program Mission

To prepare and graduate pioneering scientific and leadership competencies in the fields of physics and its branches, and to develop the knowledge base in the field of scientific research to serve the local, regional, and international communities, in addition to training and refining students' minds scientifically and cognitively, emphasizing social and cultural values, and responding to the requirements of the local market.

3. Program Objectives

1. Embodying the vision, mission, and goals of Tikrit University, and implementing best educational practices with a focus on ensuring and enhancing quality and performance.
2. Preparing specialized personnel capable of serving the community and preparing for future specializations.
3. Disseminating a culture of scientific diversity in society, transferring knowledge and scientific skills, writing academic research, and achieving creative scientific achievement through activities focused on students and faculty.
4. The college seeks to conclude scientific and cultural cooperation agreements with similar colleges and departments within various colleges to achieve best practices in the fields of teaching and learning.
5. Focusing on the educational and ethical aspects of all its members, instilling a spirit of dedication, tolerance, commitment, and work in the service of the nation.
6. Focusing on intellectual and cultural development through openness to the experiences of other countries in the fields of languages, literature, and translation.
7. Focusing on the educational and ethical aspects of students, instilling a spirit of dedication, tolerance, and commitment.

4. Program Accreditation

Nothing

5. Other external influences

Nothing

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	2	5	week	
College Requirements	2	5	week	
Department Requirements	2	5	week	
Summer Training	Nothing			
Other	Nothing			

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2025-2026/level (UGII)	PHY23013	Atomic Physics	3hr theoretical	2 hr practical

8. Expected learning outcomes of the program

Knowledge

- The student innovates solutions and explanations for physical phenomena with some modernity and creativity.
- The student knows the concept of practical physics and adapts to solving problems.
- The student designs a plan to study physical vocabulary in a new way.
- Enabling students to analyze reality from a physical perspective.

Skills
• The student will develop innovative and creative solutions and explanations for physical phenomena. • The student will gain a grasp of the concept of practical physics and be able to solve problems. • The student will design a plan to study physical vocabulary using a new approach. • The student will be able to analyze reality from a physical perspective.
Ethics
• To classify the needs for developing practical physics. • To become accustomed to applying the rules learned in speech, actions, and the interpretation of phenomena. • To positively criticize improper uses of devices based on physics. • To accurately retrieve the information studied and verify it practically. • To decipher the unknown by analogy with the known equivalent. • To be familiar with physical terms and their meanings.

9. Teaching and Learning Strategies

The learning and teaching strategy is designed to: Carefully cover in lectures the necessary fundamental material and analytical techniques, and demonstrate concepts with appropriate (and, where possible practical) examples. Allow students adequate time to practice the techniques using a large number of carefully selected tutorial problems

10. Evaluation methods

1. Monthly exams.
2. Daily exams.
3. Oral questions during lecture time based on brainstorming.
4. Reports.

11. Faculty

Lect.Dr. Sukaina Iskandar Yusuf

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Lecture	Physics	Solid state			Staff	

Professional Development

Mentoring new faculty members

Professional development of faculty members

12. **Acceptance Criterion**
(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. **The most important sources of information about the program**
State briefly the sources of information about the program.

14. Program Development Plan

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2025-2026/level (UGII)	PHY23013	Atomic Physics	Basic	*					*					*	

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

Course Description Form

1. Course Name:
Atomic Physics
2. Course Code:
PHY23013
3. Semester / Year:
Semester Three
4. Description Preparation Date:
1/9/2025
5. Available Attendance Forms:
Available Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
Number of Credit Hours (Total)=150hr Number of Units (Total) = 60 unit
7. Course administrator's name (mention all, if more than one name)
Name: **Lect.Dr. Sukaina Iskandar Yusuf** Email: Sokayna.e.yussuf@tu.edu.iq
8. Course Objectives

Course Objectives	□ Working on developing the quality of basic university education. □ Preparing human cadres capable of dealing with academic scientific research methods and applications. □ Preparing efficient cadres to meet the needs of educational institutions. □ Providing qualified cadres in response to the needs of the environment surrounding the university. □ Interacting with the community and providing professional scientific services and consultations. □ Exchanging experiences and competencies with similar colleges and research centers. □ Bringing the student to the level that qualifies him postgraduate studies to pursue research and develop in physics.

9. Teaching and Learning Strategies	
Strategy	The learning and teaching strategy is designed to: Carefully cover in lectures the neces fundamental material and analytical techniques, and demonstrate concepts with appropr (and, where possible practical) examples. Allow students adequate time to practice techniques using a large number of carefully selected tutorial problems

10. Course Structure

	Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري
Week 1	**The Quantum Theory Of Light** The nature of light and electromagnetic radiation, Thermal Radiation, Emission and Absorption of Radiation, Blackbody radiation, Blackbody radiation Spectrum.
Week 2	Wien's distribution law, Rayleigh-Jeans' law, Home Work, Planck's Law of Radiation, Derivation Wien's law from Planck's law , Derivation of Rayleigh-Jeans' law from Planck's law, Derivation of Stefan's Law from the Planck Distribution, Photoelectric Effect,
Week 3	Einstein's interpretation of photoelectric effect, Applications of Photoelectric effect, Home Works,
Week 4	**The Particle Nature of Matter** The Composition Of Atoms, Faraday's electrolysis experiment, Thomson's model of the atom.
Week 5	Rutherford's Model of the Atom, Millikan's Value of the Elementary Charge, Home works.
Week 6	**Monthly Exam.**
Week 7	The Bohr Atom, Spectral Series, Bohr's Quantum Model of the Atom, Energy levels and spectra.
Week 8	Atomic excitation: The Franck–Hertz Experiment, Bohr's Correspondence Principle,
Week 9	**MATTER WAVES** De Broglie hypothesis, De Broglie wavelength, De Broglie wave velocity, Phase and group velocities, The Heisenberg uncertainty principle, Electron diffraction, neutron diffraction.
Week 10	**QUANTUM MECHANICS IN ONE DIMENSION** Introduction, Wave function for a free particle, Schrödinger equation: Time dependent form, Schrödinger equation: steady-state form, The particle in a box: energy quantization. Harmonic oscillator. The Harmonic oscillator: solution of Schrödinger's equation, Home works
Week 11	Expectation Values, Observable , Operators, Operator equation, Operator's properties, Example 1, Example2, Home works. Eigen value equation, Example 1, Example2, Home works, Quantum Uncertainty and the Eigenvalue Property.
Week 12	**TUNNELING PHENOMENA** The Square Barrier, Barrier Penetration: Some Applications, Field Emission, Ammonia Inversion, Decay of Black Holes
Week 13	**Atomic Structure** Orbital Magnetism and the Normal Zeeman Effect, The Spinning electron,
Week 14	The spin–orbit interaction and other magnetic effect, Exchange Symmetry and the Exclusion Principle, The Periodic Table.
Week 15	**Monthly Exam**

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي العملي	
	Material Covered
Week 1	Photoelectric effect experiment
Week 2	Daily exam and discussion reports
Week 3	Experiment with the visible spectrum of the hydrogen atom
Week 4	Daily exam and discussion reports
Week 5	Rydberg constant mapping experiment.
Week 6	Daily exam and discussion reports
Week 7	Field visit to laboratories in other colleges
Week 8	Monthly exam.
Week 9	Frank-Hertz experiment
Week 10	Daily exam and discussion reports
Week 11	Schuster's method to find the specific charge of the electron e/m
Week 12	Daily exam and discussion reports
Week 13	Stefan Boltzmann's radiation law experiment
Week 14	Electron diffraction experiment
Week 15	**Monthly Exam**

11. Module Evaluation

تقييم المادة الدراسية

		Time (hr)	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	10% (10)		
	Assignments	2	5 % (5)		
	Lab	6	15% (15)		
	Tut.	2	5% (5)		
	Rating of discussions and seminars	2	5% (5)		
Summative assessment	**Midterm Exam**	2	10% (10)		
	Final Exam	3	50% (50)		
Total assessment			100% (100 Marks)		

12. Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Modern Physics (V H Satheeshkumar) 2. Atomic Physics 1st and 2nd . 3. Modern Physics 3rd (Raymond A. Serway) 4. Models of the Atomic Nucleus 2nd (Norman D. Cook)	yes
Recommended Texts	1. Solid State Physics 1st (Yahya Nouri Al-Jamal) 2. Solid State Physics 2nd (Yahya Nouri Al-Jamal) **3.** Articles from internet about the subjects	yes
Websites	https://www.academia.edu/ https://www.researchgate.net/ https://scholar.google.com/	

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

Academic Program and Course Description Guide

2025-2026

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

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

Concepts and terminology:

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

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

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

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

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

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

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

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

Academic Program Description Form

University Name: Tikrit

Faculty/Institute: Sciences

Scientific Department: Physics

Academic or Professional Program Name: Bachelor's

Final Certificate Name: Physics

Academic System: Sixth Semester

Description Preparation Date: 01/02/2026

File Completion Date: 01/02/2026

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 1/2/2026

Signature:

Approval of the Dean

1. Program Vision

The College of Science seeks to be one of the leading higher education institutions at Tikrit University in the field of modern education and scientific research through its scientific, research and administrative activities. It also works to provide an integrated path for its students and professors to make them active and creative in serving society in the fields of natural sciences (Biology sciences - chemistry - Physics - Earth sciences) and its teaching.

2. Program Mission

Working to prepare and graduate leading scientific and leadership competencies in the natural sciences, scientific research and literature, and to develop the balance of knowledge in the field of scientific research to serve the local, regional and international community, as well as training and refining the minds of students scientifically and cognitively, and emphasizing social and cultural values and responding to the requirements of the local market.

3. Program Objectives

1. Embodying the vision, mission and goals of Tikrit University, and applying the best educational practices with a focus on ensuring and enhancing quality and performance.
2. Preparing specialized cadres capable of serving the community and preparing for the preparation of future specializations.
3. Spreading the culture of human diversity in society, transferring scientific knowledge and skills, writing academic research, and creative scientific achievement through student- and teaching-focused activities.
4. The college seeks to conclude scientific and cultural cooperation agreements with corresponding colleges and corresponding departments in different colleges to achieve best practices in the fields of teaching, learning and translation.
5. Focusing on the educational and moral aspects of all its members and spreading the spirit of dedication, tolerance, commitment and work to serve the nation.
6. Paying attention to intellectual and cultural construction through openness to the experiences of other countries in the fields of natural sciences in its various departments, as well as scientific research.
7. To understand of the science of optics, theories of light, Optical Phenomena , the Nature of Light Phase Speed and Group Speed, Doppler Effect , Michelson and Morley ,Polarization and its Types, Polarization Angle and Brewster's Law ,Mullas' Law Fresnel's Equations, Brewster's Angle , interference , diffraction and diffraction Grating

4. Program Accreditation

nothing

5. Other external influences

nothing

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	6 ECTS	2 + 1 hour Tutorial		Basic course
College Requirements	Yes			
Department Requirements	Yes			
Summer Training	Yes			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2024-2025 / year 3	PHY36031	Physical optics	theoretical	practical
			2	2

8. Expected learning outcomes of the program

Knowledge

1- The student's ability to classify needs to develop theoretical and practical reality in the subject of physical optics.
2- To get used to practicing the rules and scientific studies he has learned in his life and daily work.
3- To positively criticize the improper use of devices and components related to optical devices.
4- To recall the information he studied carefully and verify it practically in order to find appropriate solutions to the related problems
Optical scientific materials and equipment.
5- To decipher the unknown by measuring the known counterpart using accurate measuring devices.
6- To take note of visual physics terms and their meanings, which helps the student's development in the future?

Skills

1 - The student should devise solutions and explain some of the problems related to the sciences of optics and related devices
Modernity and creativity.
2 - The student's knowledge of the concept of theoretical and practical physics of optics

and adaptation to overcome obstacles in
this field .
3 - The student will design a plan to study the vocabulary of the subject of physical optics in a new and accurate manner through...
Building a solid academic base for the student at the beginning of his university studies on which he can rely when trying to develop himself in this way
the field.
4- Enabling students to analyze reality and phenomena from an accurate scientific physical perspective.

Ethics

1- Reception
At this level, the student shows interest in the subject of physical optics and its study, and the learning outcomes range from simple awareness to interest, to acceptance, then innovation and creativity.
2- Response
Here the student's level of interest goes beyond participation, so that he takes a position on the subject of study.
3- Value judgment
Here the student moves to a higher level by giving value to the subject, a value that has an impact on the student's personality.
4- Value organization
It means building a value system for the student based on comparison, linking, and grouping, so that the learner forms his own concepts related to value.
5- Normalization or labeling with value
It is the highest level where value is formed as a characteristic that distinguishes the student from others and influences his behavior, through which he can develop his lifestyle.

9. Teaching and Learning Strategies

1- How to deliver in-person lectures after publishing them on the class's Classroom website.
2- Display some pictures and shapes related to the lecture using PowerPoint.
3- Use some simulation programs to explain the lecture in more scientific and clear ways.
4- Using three-dimensional educational clips through YouTube programs, which help the student visualize the devices Visual images and their installation through this software.

10. Evaluation methods

1- Monthly exams.
2- Daily exams (Quiz).
3- Oral questions during lecture time with homework.
4- End of course exams

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (If applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Lecturer	Physics	Laser			Staff	

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

البصريات الفيزيائية لطلبة الصفوف الثالثة فيزياء
الدكتور : حسن محمود جواد الشربتي
الدكتور : بتول حميد فرج الخياط
الدكتور : صبحي كمال حسون
كلية التربية – جامعة بغداد

1- Physics of Light and Optics
Justin Peatross
MichaelWare
Brigham Young University
2015 Edition
May 8, 2023 Revision

1- Jenkins and White-Fundamentals Of Optics, Physics Book 90

3- FUNDAMENTALS
OF OPTICS FourthEdition
Francis A. Jenkins
Late Professor of Physics
University of California, Berkeley
Harvey E. White

14. Program Development Plan

1- Using the latest sources and including topics that are consistent with modernity, the requirements of scientific and practical life, and what scientists have reached, on an ongoing basis.
2- Introducing advanced scientific equipment into the physical optics laboratory to carry out scientific experiments in the laboratory, which enhances the student's ability to understand the sciences of physical and engineering optics.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2025-2026	PHY36031	Physical optics	Basic	—				—				—			

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

Course Description Form

1. Course Name:
Physical optics
2. Course Code:
PHY36031
3. Semester / Year:
Second Semester / year 3
4. Description Preparation Date:
: 01/ 02/ 2025
5. Available Attendance Forms:
Attendance Only
6. Number of Credit Hours (Total) / Number of Units (Total)
6 ECTS - 2 hours a week + 1 hour Tutorial
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Faleh Lafta Mater Al-Jashaam Email: Faleh.l.mater@tu.edu.iq
8. Course Objectives
1- Conveying a general idea about the subject of physical optics and the importance of t course to physics departments. It is done through **Teaching the subject of physical optics provides students with some skills about the basics a principles of optics, optical devices and the parts that are composed of them, knowing th types and shapes, how they work, and connecting their electrical circuits. Which ma students familiar with the most important topics that they may encounter in daily practical by dealing with lenses, gratings, single-wavelength sources, interference and diffraction of various types, methods of operation and their importance? In addition to teaching the stud to use highly relevant measuring devices Falling light.** **2- Preparing competent and specialized staff in the field of optics and optical devices in various forms Iraq.**
9. Teaching and Learning Strategies
1- Educational strategy, collaborative concept planning. **2- Brainstorming education strategy.** 2- **Education Strategy Notes Series.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 hours	Light propagation, optic phenomena, and the natu of light		1- In-person and electronic lectures 2- Display some pictures and shapes related to the lecture on the PPT program. 3- Using some simulation programs to explain the lecture in more scientific and clear ways	Weekly, monthly, daily, written exams, H.W and the end-of-year exam.
2	2 hours	Reflection and refractio a plane interval			
3	2 hours	Amplitudes of reflected refracted waves and Fresnel's equations			
4	2 hours	Brewster's angle in light Fresnel's equations			
5	2 hours	Phase change and intern reflection			
6	2 hours	Polarization and its type Polarization angle and Brewster's law			
7	2 hours	Males's law **First month exam**			
8	2 hours	Coherence and interference/Internal			
9	2 hours	superposition principle			
10	2 hours	Jung's experiment Films and reflection			
11	2 hours	Franhofer diffraction/Frennel diffraction			
12	2 hours	Diffraction grating Fabry-Pérot interferometer			
13	2 hours	Michelson in interference			
14	2 hours	**Second month exam**			
15					

11. Course Evaluation

Distribution as follows: 25 marks for monthly and daily exams and homework for the first month. 25 marks for monthly and daily exams and homework for the second month. 50 marks for final exams.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	البصريات الفيزيائية لطلبة الصفوف الثالثة فيزياء الدكتور : حسن محمود جواد الشربتي الدكتور : بتول حميد فرج الخياط الدكتور : صبحي كمال حسون كلية التربية ـ جامعة بغداد
Main references (sources)	**1- Physics of Light and Optics** **Justin Peatross** **MichaelWare** **Brigham Young University** **2015 Edition** **May 8, 2023 Revision**
Recommended books and references (scientific journals, reports…)	**3- FUNDAMENTALS** **OF OPTICS FourthEdition** **Francis A. Jenkins** **Late Professor of Physics** **University of California, Berkeley** **Harvey E. White**
Electronic References, Websites	**Iraqi virtual electronic library,** **Sources of physical optics from the Internet**

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

Academic Program and Course Description Guide

2025-2026

Introduction:

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Academic Program Description Form

University Name: Tikrit University

Faculty/Institute: Collage of Science

Scientific Department: Physics

Academic or Professional Program Name: Physics

Final Certificate Name: Bachelor of Science in Physics

Academic System: Courses

Description Preparation Date: 5/10/2025

File Completion Date: 5/10/2025

Signature: Assist.Prof.Dr.Hussin K.Mouhameed

Head of Department Name:

Date: 18/3/2025

أ.م.د. هراس فارس رجا
معاون العميد للشؤون العلمية
والدراسات العليا

Signature: Prof.Dr.Firas F.Naja

Scientific Associate Name:

Date: 18/3/2025

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 18/3/2025

Signature:

Approval of the Dean

الأستاذ الدكتور
عبد الخالق علوان محمد
عميد كلية العلوم

1. Program Vision

The College of Science at Tikrit University aspires to be one of the leading academic institutions in the field of physics by adopting the latest methods of higher education and promoting scientific research through its academic, research, and administrative activities. It also seeks to provide an integrated educational environment for its students and faculty, contributing to the development of their scientific and practical skills, enabling them to become effective and creative agents in serving society. This is achieved by developing modern physics applications and employing them in various fields, such as energy, advanced materials, and nanotechnology.

2. Program Mission

The College of Science at Tikrit University seeks to prepare and graduate distinguished scientific and research talents in the field of physics and its applied sciences, with a focus on developing scientific knowledge and promoting academic research to serve the local, regional, and international community. It also aims to train and hone students' scientific and practical skills, enhancing their innovative capabilities in line with modern technological developments, emphasizing academic and professional values, and responding to the demands of the local and international labor market in advanced physics and industrial fields.

3. Program Objectives

1. Embodying the vision, mission, and objectives of Tikrit University by applying the latest educational methods in physics, with a focus on quality assurance and enhancing academic and research performance.
2. Preparing highly qualified, specialized personnel capable of serving the community, while preparing for the development of advanced physics specializations that meet future needs.
3. Disseminating the culture of scientific research and innovation in the academic community by developing physical analysis skills and conducting advanced scientific research that contributes to technological development.
4. Enhancing scientific and cultural cooperation by concluding partnership agreements with similar universities and colleges locally and internationally, with the aim of exchanging expertise and achieving excellence in research, education, and modern physics applications.
5. Focusing on developing educational and ethical values among college members—students, faculty, and staff—and instilling a spirit of dedication and scientific and professional responsibility to serve the community and nation.
6. Enhancing the intellectual and cultural development of students by opening up to world-leading scientific experiments in the fields of applied physics, materials, energy, and theoretical physics.
7. Qualifying students for the labor market through practical training and developing their research and applied skills in line with modern developments in physics, engineering, and advanced technology.

4. Program Accreditation

None

5. Other external influences

None

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	1	6		Semester course
College Requirements	Yes			
Department Requirements	Yes			
Summer Training	None			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2026-2025 / Fourth		Solid state physics	theoretical	Lab

8. Expected learning outcomes of the program

Knowledge

To familiarize students with the importance of electromagnetic theories in the modern era, such as Maxwell's equations in analyzing electric and magnetic fields and their impact on technological developments and modern communications. 1. To classify the needs for developing practical physics. 2. To become accustomed to applying the rules learned in speech,	

actions, and the interpretation of phenomena. 3. To accurately retrieve the information studied and verify it practically. 4. To decipher the unknown by analogy with the known equivalent. 5. To be familiar with physical terms and their meanings.	
Skills	
- The student will develop innovative and creative solutions and explanations for physical phenomena. 2. The student will understand the concept of practical physics and be able to solve problems. 3. The student will design a plan to study physical vocabulary using a new approach. 4. The student will be able to analyze reality from a physical perspective..	
Ethics	
To establish scientific rigor and critical thinking in physical analysis, foster creativity and innovation in the application of physical concepts, and instill a commitment to scientific and professional ethics in research and experimentation.	

9. Teaching and Learning Strategies

1- Lecture delivery method.

2- Student groups (Team Project).

3- Standard method.

4- Practical lecture

10. Evaluation methods

Assessment methods rely on a variety of approaches that ensure deep understanding and comprehension of solid-state physics concepts. These include: theoretical and practical exams, continuous assessment through assignments and reports, presentations, research projects, and class discussions, in addition to short tests to assess immediate comprehension and interaction with the scientific material.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assistant Professor Dr. Amjad H. Jassim	Physics	solid state				

Professional Development

Mentoring new faculty members

- The ability to express ideas clearly and confidently.

2- Teamwork: Working confidently within a team.

3- Analyzing, investigating, and gathering information systematically and scientifically to establish facts and principles to solve a problem.

4- Motivation to work and the ability to take initiative, identify opportunities, and develop proposed ideas and solutions.

Professional development of faculty members

12. Acceptance Criterion

13. The most important sources of information about the program

1- Solids for kitel

2- Books and research published by reputable Iraqi and international universities

3- Fundamentals of Physics, approved practical physics books, Tikrit Journal of Pure Sciences

14. Program Development Plan

1. Updating the academic content

Reviewing the curriculum and incorporating the latest developments and modern applications.

2. Enhancing the practical aspect

Developing laboratories and adding simulation software such as MATLAB and COMSOL.

3. Improving teaching strategies

Implementing active learning, research projects, and interactive classes.

4. Developing assessment methods

Adopting continuous assessment through short tests and applied projects.

5. Linking the program to the labor market

Cooperating with industrial sectors to provide practical training and applied projects.

Program Skills Outline														
				Required program Learning outcomes										
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics		
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Fourth stage/2025-2026				•					•					•	
		Solid state physics	Basic												

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

Course Description Form

1. Course Name:
Solid state physics
2. Course Code:
PHY412
3. Semester / Year:
Semester
4. Description Preparation Date:
1/10/2025
5. Available Attendance Forms:
In-person only
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours per semester (2 hours per week)
7. Course administrator's name (mention all, if more than one name)
Name: Assist.Prof.Dr.Amjad H.Jassim Email: amjad@tu.edu.iq
8. Course Objectives

• Gain basic knowledge of Solid state physics and scientific applications. • Clarify the relationship between an Solid st physics d practical applications. • Expand research and analysis skills using advan tools and software.	• ..... • ..... • .....

9. Teaching and Learning Strategies	
Strategy	• Using interactive lectures to explain basic concepts and practical applications. • Employing computer programs and simulations to enhanc theoretical and experimental understanding. • Encouraging self-learning through research projects a applied studies.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	2 hours 2 hours 2 hours 2 hours 2 hours 2 hours 2 hours Exam 2 hours 2 hours 2 hours 2 hours 2 hours 2 hours Exam	Providing stude with a deep understanding c concepts and th Solid state phys applications. Expanding analytical and critical thinking skills t solve complex physical proble Clarifying relationship between electromagnetic theories modern technologies in fields engineering communication	Solid stat physics	Interactive learning thro lectures and scientific discussions. Self-learning thro research projects advanced exercises.	Weekly, mont daily, writ and final exan

11. Course Evaluation

50 marks for effort, 50 marks for final exam.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Some topics from solid state physics that suitable for the students' level
Main references (sources)	Solid state physics book
Recommended books and references (scientific journals, reports...)	Electromagnetic Fields, Parts 1 and 2
Electronic References, Websites	Fundamentals of Physics, Approv Practical Physics Books, Tik Journal of Pure Sciences.

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

Academic Program and Course Description Guide

2025-2026

Introduction:

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

Concepts and terminology:

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

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

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

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

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

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

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

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

Academic Program Description Form

University Name: Tikrit University

Faculty/Institute: Collage of Science

Scientific Department: Physics

Academic or Professional Program Name: Physics

Final Certificate Name: Bachelor of Science in Physics

Academic System: Courses

Description Preparation Date: 5/10/2025

File Completion Date: 5/10/2025

Signature: Assist.Prof.Dr.Hussin K.Mouhameed

Head of Department Name:

Date:

Signature: Prof.Dr.Firas F.Naja

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 5/10/2025

Signature:

Approval of the Dean

1. Program Vision

The College of Science at Tikrit University aspires to be one of the leading academic institutions in the field of physics by adopting the latest methods of higher education and promoting scientific research through its academic, research, and administrative activities. It also seeks to provide an integrated educational environment for its students and faculty, contributing to the development of their scientific and practical skills, enabling them to become effective and creative agents in serving society. This is achieved by developing modern physics applications and employing them in various fields, such as energy, advanced materials, and nanotechnology.

2. Program Mission

The College of Science at Tikrit University seeks to prepare and graduate distinguished scientific and research talents in the field of physics and its applied sciences, with a focus on developing scientific knowledge and promoting academic research to serve the local, regional, and international community. It also aims to train and hone students' scientific and practical skills, enhancing their innovative capabilities in line with modern technological developments, emphasizing academic and professional values, and responding to the demands of the local and international labor market in advanced physics and industrial fields.

3. Program Objectives

1. Embodying the vision, mission, and objectives of Tikrit University by applying the latest educational methods in physics, with a focus on quality assurance and enhancing academic and research performance.
2. Preparing highly qualified, specialized personnel capable of serving the community, while preparing for the development of advanced physics specializations that meet future needs.
3. Disseminating the culture of scientific research and innovation in the academic community by developing physical analysis skills and conducting advanced scientific research that contributes to technological development.
4. Enhancing scientific and cultural cooperation by concluding partnership agreements with similar universities and colleges locally and internationally, with the aim of exchanging expertise and achieving excellence in research, education, and modern physics applications.
5. Focusing on developing educational and ethical values among college members—students, faculty, and staff—and instilling a spirit of dedication and scientific and professional responsibility to serve the community and nation.
6. Enhancing the intellectual and cultural development of students by opening up to world-leading scientific experiments in the fields of applied physics, materials, energy, and theoretical physics.
7. Qualifying students for the labor market through practical training and developing their research and applied skills in line with modern developments in physics, engineering, and advanced technology.

4. Program Accreditation

None

5. Other external influences

None

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	1	6		Semester course
College Requirements	Yes			
Department Requirements	Yes			
Summer Training	None			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2026-2025 / Fourth		Solid state physics	theoretical	Lab

8. Expected learning outcomes of the program

Knowledge	
To familiarize students with the importance of electromagnetic theories in the modern era, such as Maxwell's equations in analyzing electric and magnetic fields and their impact on technological developments and modern communications. 1. To classify the needs for developing practical physics. 2. To become accustomed to applying the rules learned in speech,	

actions, and the interpretation of phenomena. 3. To accurately retrieve the information studied and verify it practically. 4. To decipher the unknown by analogy with the known equivalent. 5. To be familiar with physical terms and their meanings.	
Skills	
- The student will develop innovative and creative solutions and explanations for physical phenomena. 2. The student will understand the concept of practical physics and be able to solve problems. 3. The student will design a plan to study physical vocabulary using a new approach. 4. The student will be able to analyze reality from a physical perspective..	
Ethics	
To establish scientific rigor and critical thinking in physical analysis, foster creativity and innovation in the application of physical concepts, and instill a commitment to scientific and professional ethics in research and experimentation.	

9. Teaching and Learning Strategies

1- Lecture delivery method.

2- Student groups (Team Project).

3- Standard method.

4- Practical lecture

10. Evaluation methods

Assessment methods rely on a variety of approaches that ensure deep understanding and comprehension of solid-state physics concepts. These include: theoretical and practical exams, continuous assessment through assignments and reports, presentations, research projects, and class discussions, in addition to short tests to assess immediate comprehension and interaction with the scientific material.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assistant Professor Dr. Amjad H. Jassim	Physics	solid state				

Professional Development

Mentoring new faculty members

- The ability to express ideas clearly and confidently.

2- Teamwork: Working confidently within a team.

3- Analyzing, investigating, and gathering information systematically and scientifically to establish facts and principles to solve a problem.

4- Motivation to work and the ability to take initiative, identify opportunities, and develop proposed ideas and solutions.

Professional development of faculty members

12. Acceptance Criterion

13. The most important sources of information about the program

1- Solids for kitel

2- Books and research published by reputable Iraqi and international universities

3- Fundamentals of Physics, approved practical physics books, Tikrit Journal of Pure Sciences

14. Program Development Plan

1. Updating the academic content

Reviewing the curriculum and incorporating the latest developments and modern applications.

2. Enhancing the practical aspect

Developing laboratories and adding simulation software such as MATLAB and COMSOL.

3. Improving teaching strategies

Implementing active learning, research projects, and interactive classes.

4. Developing assessment methods

Adopting continuous assessment through short tests and applied projects.

5. Linking the program to the labor market

Cooperating with industrial sectors to provide practical training and applied projects.

Program Skills Outline

Year/Level	Course Code	Course Name	Basic or optional	Required program Learning outcomes											
				Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Fourth stage/2025-2026				•					•					•	
		Solid state physics	Basic												

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

Course Description Form

1. Course Name:
Solid state physics
2. Course Code:
PHY412
3. Semester / Year:
Semester
4. Description Preparation Date:
1/10/2025
5. Available Attendance Forms:
In-person only
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours per semester (2 hours per week)
7. Course administrator's name (mention all, if more than one name)
Name: Assist.Prof.Dr.Amjad H.Jassim Email: amjad@tu.edu.iq
8. Course Objectives

• Gain basic knowledge of Solid state physics and scientific applications. • Clarify the relationship between an Solid st physics d practical applications. • Expand research and analysis skills using advan tools and software.	• ..... • ..... • .....

9. Teaching and Learning Strategies	
Strategy	• Using interactive lectures to explain basic concepts and practical applications. • Employing computer programs and simulations to enhanc theoretical and experimental understanding. • Encouraging self-learning through research projects a applied studies.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 hours	Providing stude with a deep understanding c concepts and th Solid state phys applications. Expanding analytical and critical thinking skills t solve complex physical proble Clarifying relationship between electromagnetic theories modern technologies in fields engineering communication	Solid stat physics	Interactive learning thro lectures and scientific discussions. Self-learning thro research projects advanced exercises.	Weekly, mont daily, writ and final exam
2	2 hours				
3	2 hours				
4	2 hours				
5	2 hours				
6	2 hours				
7	2 hours				
8	Exam				
9	2 hours				
10	2 hours				
11	2 hours				
12	2 hours				
13	2 hours				
14	2 hours				
15	Exam				

11. Course Evaluation

50 marks for effort, 50 marks for final exam.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Some topics from solid state physics that suitable for the students' level
Main references (sources)	Solid state physics book
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Academic Program and Course Description Guide

2026

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

Academic Program Description Form

University Name: .....**University of Tikrit**.....

Faculty/Institute: .....**College of Science**.....

Scientific Department: .....physics.....

Academic or Professional Program Name: ..... Bachelor of physics

Final Certificate Name: ..... Bachelor of physics.....

Academic System: ...Bolonia.....

Description Preparation Date:

File Completion Date: 5/17/2026

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

1. Program Vision
Ensuring that the actual need for teaching staff is fulfilled through appointment and transfer in computer specializations and some mathematics specializations. Urging teachers to complete scientific research in the field of specialization. Raising the academic and scientific level of college students and involving the teaching staff in

development courses inside and outside the country. Involving technical and administrative staff in development courses, one course during the academic year.

2. Program Mission

Providing an advanced educational environment and establishing a nucleus for scientific research capable of providing society with scientific competencies and trained specialized personnel through the introduction of the latest scientific technologies.

3. Program Objectives

General statements describing what the program or institution intends to achieve.

4. Program Accreditation

N/A

5. Other external influences

N/A

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	15	2		Secondary
College Requirements	Yes			
Department Requirements	Yes			
Summer Training	N/A			
Other				

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

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
2024-2025/ Fourth			theoretical	practical
			2	

8. Expected learning outcomes of the program	
Knowledge	
understanding	Demonstrate adequate knowledge of English grammar, vocabulary, and sentence structure at an intermediate level. Understand the main ideas and supporting details in academic and non-academic English texts. Recognize and use appropriate English expressions in academic and everyday communication.
Skills	
Reading	Read and comprehend intermediate-level English texts with reasonable accuracy and fluency.
Basic grammar	The students should be able to produce correct sentence with correct grammar.
Ethics	
Sharing thoughts	Enhance the students ability to share thoughts.

9. Teaching and Learning Strategies
Explain and discuss the scientific material related to tenses in language. Enhance the student's ability to write by doing homework and paraphrasing some paragraph. Encourage the students to make a conversation among them from their daily life.

10. Evaluation methods
Weekly, dailly, monthly, yearly.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Assistant lecturer	Translation	Translation			Staff	Lecturer

Professional Development

Mentoring new faculty members

Briefly describes the process used to mentor new, visiting, full-time, and part-time faculty at the institution and department level.

Professional development of faculty members

Briefly describe the academic and professional development plan and arrangements for faculty such as teaching and learning strategies, assessment of learning outcomes, professional development, etc.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

Sources adopted by the ministry of higher education and scientific research.

14. Program Development Plan

Providing a set of advice and guidance that is in the student's interest to develop his skills, including teamwork, the spirit of cooperation, time management, and

setting priorities.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
2024-2025		English language		*	*	*	*	*	*	*	*	*	*	*	*

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

Course Description Form

1. Course Name:
English language
2. Course Code:
3. Semester / Year:
Semester
4. Description Preparation Date:
15/9/2024
5. Available Attendance Forms:
In Person only
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours weekly
7. Course administrator's name (mention all, if more than one name)
Name: Assistant lecturer Omar Ali SALEH Email: omar.saleh122@tu.edu.iq
8. Course Objectives

Comprehension and understanding: The student has understood the scientific material and expressed it in his own style and language. **The ability to remember English words and put them into useful sentences**	• ..... • ..... • .....

9. Teaching and Learning Strategies	
Strategy	Explain and discuss the scientific material related to tenses language. Enhance the student's ability to write by do homework and paraphrasing some paragraph. Encourage students to make a conversation among them from their daily lif

10. Course Structure

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

11. Course Evaluation

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

12. Learning and Teaching Resources

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

Introduction:

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Faculty/Institute: .....**College of Science**.....

Scientific Department: .....physics.....

Academic or Professional Program Name: ..... Bachelor of physics

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File Completion Date: 5/17/2026

Signature:

Head of Department Name:

Date:

Signature:

Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date:

Signature:

Approval of the Dean

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Involving technical and administrative staff in development courses, one course during the academic year.

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3. Program Objectives

General statements describing what the program or institution intends to achieve.

4. Program Accreditation

N/A

5. Other external influences

N/A

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	15	2		Secondary
College Requirements	Yes			
Department Requirements	Yes			
Summer Training	N/A			
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2024-2025/ Fourth			theoretical	practical
			2	

8. Expected learning outcomes of the program

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understanding	Demonstrate adequate knowledge of English grammar, vocabulary, and sentence structure at an intermediate level. Understand the main ideas and supporting details in academic and non-academic English texts. Recognize and use appropriate English expressions in academic and everyday communication.
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Explain and discuss the scientific material related to tenses in language. Enhance the student's ability to write by doing homework and paraphrasing some paragraph. Encourage the students to make a conversation among them from their daily life.

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Weekly, dailly, monthly, yearly.

11. Faculty

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Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
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Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc

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

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2025 – 2026

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Scientific Department: Physics
Academic or Professional Program Name: Bachelor of Science in Physics
Final Certificate Name: Bachelor of Science in Physics
Academic System: Bologna
Description Preparation Date: 4/10/2025
File Completion Date: 4/10/2025

Signature:
Head of Department Name:
Date:

Signature:
Scientific Associate Name:
Date:

The file is checked by:
Department of Quality Assurance and University Performance
Director of the Quality Assurance and University Performance Department:
Date:
Signature:

Approval of the Dean

1. Program Vision

The College of Science seeks to be one of the leading higher education institutions at Tikrit University in the field of modern education and scientific research through its scientific, research and administrative activities. It also works to provide an integrated path for its students and professors to make them active and creative in serving the community in various educational fields.

2. Program Mission

Working to prepare and graduate leading scientific and leadership competencies in physics, its sciences and literature, and in developing the knowledge base in the field of scientific research to serve the local, regional and international community, as well as training and refining students' minds scientifically and intellectually, and emphasizing social and cultural values and responding to the requirements of the local market.

3. Program Objectives

1- To embody the vision, mission, and goals of Tikrit University, and to implement best educational practices with a focus on ensuring and enhancing quality and performance.

2- To prepare specialized personnel capable of serving the community and laying the groundwork for future specializations.

3- To promote a culture of human diversity within the community and to transfer knowledge and language skills, as well as to foster academic research and creative scientific achievement through student- and faculty-focused activities.

4- The college seeks to establish scientific and cultural cooperation agreements with counterpart colleges and departments in other colleges to achieve best practices in the fields of teaching and learning.

5- To focus on the educational and ethical development of all its members and to instill a spirit of dedication, tolerance, commitment, and service to the nation.

6- To cultivate intellectual and cultural development by engaging with the experiences of other countries in the fields of modern education and learning.

7- To focus on the educational and ethical development of students and to instill a spirit of dedication, tolerance, and commitment.

4. Program Accreditation

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5. Other external influences

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6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements				
College Requirements				
Department Requirements				
Summer Training				
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes	1- A deep understanding of fundamental physical concepts such as motion, force, energy, and electromagnetism. 2- The ability to apply theoretical concepts to solve practical problems and conduct physics experiments. 3- Analytical and critical thinking skills in dealing with complex physical phenomena.

	4- The ability to use mathematics as a tool to understand and analyze physical phenomena. 5- Familiarity with scientific methods in research, experimentation, and data analysis. 6- Development of teamwork and collaboration skills in laboratories and research projects. 7- Development of effective communication skills through report writing, presentations, and technical discussions on physics topics. 8- Creative thinking and the ability to develop novel solutions to complex physics problems. 9- An understanding of the importance and applications of physics in other fields such as medicine, engineering, and technology. 10-Critical analysis of the ethics and social impacts of scientific and technological advancements in physics.
Skills	
Learning Outcomes	1- Proficiency in experimentation and precise measurements in physics laboratories. 2- Ability to use physics instruments and equipment skillfully and effectively. 3- Skills in analyzing and interpreting data obtained from physics experiments. 4- Ability to use computing and programming to process and analyze data. 5- Technical drawing and design skills to represent physics phenomena and experimental results. 6- Development of teamwork and collaboration skills in conducting experiments and analyzing results. 7- Ability to use mathematics effectively in problem-solving and data analysis. 8- Effective communication skills through writing scientific reports and delivering presentations. 9- Ability to develop and implement research projects in various fields within physics. 10-Development of creative and innovative problem-solving skills to address diverse physics challenges.

Ethics	
Learning Outcomes	1- Critical and systematic thinking in dealing with physical problems and challenges, and in life in general. 2- Developing patience and perseverance in facing scientific challenges and solving complex problems. 3- Promoting honesty and integrity in conducting scientific research and experiments and presenting results. 4- Cultivating curiosity and exploration to understand the physical phenomena behind natural phenomena. 5- Fostering the values of cooperation and teamwork in experiments and research projects. 6- Promoting respect and appreciation for the diversity of ideas and opinions within the scientific community. 7- Promoting ethical values and social responsibility in the use of science and technology. 8- Developing the ability to think creatively and develop new solutions to global problems. 9- Raising awareness of the importance of environmental conservation and sustainability in scientific and technological development. 10-Enhancing the ability to make informed decisions based on scientific and ethical knowledge.

9. Teaching and Learning Strategies

1- Explain the scientific material by presenting slides, experiments, and their associated systems to the students, and instructing them to prepare reports on the material.

2- Write a review sheet summarizing all the key concepts presented during the lectures.

3- Connect these concepts to the questions and the scientific material for the students.

10. Evaluation methods

Weekly, monthly, daily exams, reports, and end-of-year exam.

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer

Professional Development

Mentoring new faculty members

Directing new faculty members to work hard, conduct continuous and intensive research and reading to keep abreast of scientific progress and build an excellent scientific foundation.

Professional development of faculty members

1- Continuously updating knowledge and skills in physics through participation in specialized workshops, seminars, and training courses.

2- Continuously conducting research and publishing in prestigious scientific journals to contribute to the advancement of knowledge in physics.

3- Communicating and collaborating with researchers and other institutions both locally and internationally to exchange experiences and knowledge.

4- Developing teaching skills and adopting innovative and effective teaching methods to convey physics concepts appropriately to students.

5- Utilizing technology in the teaching and learning process through the use of multimedia and modern educational applications.

6- Developing supervisory and mentoring skills for students in research projects and theses.

7- Participating in academic activities and scientific conferences to build networks and exchange experiences with colleagues in the field.

8- Developing management and leadership skills to contribute to the development and improvement of the department and the educational institution as a whole.

9- Developing research and scientific writing skills to publish research and articles in high-impact scientific journals.

10- Committing to lifelong learning and adopting a culture of innovation and continuous development in physics and education.

12. Acceptance Criterion

13. The most important sources of information about the program

1- Official websites of universities and colleges with physics departments, where information about academic programs, courses, and faculty members can be found.

2- Academic physics textbooks and scientific references used in higher education, covering various fields and topics in physics.

3- Peer-reviewed scientific journals in physics, where the latest research, discoveries, and studies are published.

4- Electronic scientific databases, such as PubMed, Scopus, and Web of Science, which provide access to research and scientific articles in physics.

5- Scientific conferences and seminars in physics, where recent research is discussed and experiences and ideas are exchanged with other researchers.

6- Scientific websites that offer free articles and resources in physics, such as the websites of scientific societies and international organizations.

7- Online learning platforms and online courses in physics, which provide video lectures and interactive educational resources.

8- University and research center libraries that contain extensive collections of books and scientific journals in physics.

14. Program Development Plan

1- **Assessing the Current Situation:**

- Conduct a comprehensive evaluation of the department's performance and review the curriculum and academic programs offered.
- Gather feedback from students and faculty members regarding the department's current strengths and weaknesses.

2- **Setting Goals:**

- Define the main objectives for the department's development based on identified needs and

challenges.

- Set concrete and measurable goals related to educational and research quality and community service.

3- Developing Curricula and Programs:

- Update the curriculum to reflect the latest developments in physics.
- Develop specialized study programs that meet student needs and labor market demands.
- Provide opportunities for hands-on learning and scientific experiments to enhance students' understanding and practical skills.

4- Enhancing the Quality of Teaching and Learning:

- Organize workshops and training programs for faculty members to develop their teaching and communication skills with students.
- Promote the use of modern educational technologies and multimedia in the teaching process.
- Offer development courses for students to enhance their critical thinking and practical skills in physics.

5- Supporting Scientific Research:

- Provide the necessary resources and facilities to support scientific research and research projects for faculty members and students. - Encouraging local and international research collaborations through the organization of conferences, seminars, and workshops.
- Directing efforts towards achieving innovative research results and effective contributions to the field of physics.

6- Strengthening ties with the community:

- Organizing interactive events and activities with industry, research institutions, and the local community.
- Providing volunteer and internship opportunities for students at physics-related institutions.
- Offering consultations and technical services to the community in physics-related fields.

7- Evaluation and follow-up:

- Conducting periodic evaluations of the department's performance and the achievement of its objectives.
- Soliciting feedback from students, faculty, and the local community for continuous improvement and development of the plan.

9. Teaching and Learning Strategies

Strategy	Thinking skill according to the student's ability (Let's Think about Thinking Ability) The goal of this skill is for the student to believe concretely (the student's abilities), to understand when, what and how they should think and to improve the ability to think sensibly. High thinking skill (the aim of this skill is to teach thinking well before making the decision that determines the life of the student).

10. Course Structure (Theoretical curriculum)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understanding the topic of the lecture	Introduction, Laser Beam Dimensioning, Laser Frequency Stability	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
2	2	Understanding the topic of the lecture	Selection of Laser Emission Spectral Lines, Single-Mode Operation, Continuous and Pulsed Operation	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
3	2	Understanding the topic of the lecture	Quality Factor Control, Quality Factor Control Methods, Mode Locking	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
4	2	Understanding the topic of the lecture	Harmonic Generation, Physical Interpretation of Nonlinear Optics, Nonlinear Optical Materials, Optical Parameter Oscillations	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
5	2	Understanding the topic of the lecture	Introduction, Solid-State Lasers	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
6	2	Understanding the topic of the lecture	Gas-State Lasers	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
7	2	Understanding the topic of the lecture	Liquid-State Lasers (Dye Lasers)	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
8	2	Monthly exam	Monthly exam	Attendance	Attendance exam
9	2	Understanding the topic of the lecture	Semiconductor Lasers	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
10	2	Understanding the topic of the lecture	Chemical Lasers	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
11	2	Understanding the topic of the lecture	Laser Classifications	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
12	2	Understanding the topic of the lecture	Introduction, Laser Applications in Physics and Chemistry, Laser Applications in Biology	Lecture (attendance) + PDF (electronic)	Discussion and oral questions

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4

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

Course Description Form

1. Course Name:	
Laser Applications	
2. Course Code:	
PHY36132	
3. Semester / Year:	
Bolonga	
4. Description Preparation Date:	
4/10/2025	
5. Available Attendance Forms:	
Attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
75 hours, at a rate of 5 hours per week (divided into 2 hours of theory + 2 hou of practical work + 1 hour of discussion) for 15 weeks / 6 European ECTS units	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Prof. Dr. Sahar Naji Rashid Email: sahar83@tu.edu.iq	
8. Course Objectives	
Course Objectives	• Learn about the modifications of laser output, its interactions with matter, its most important applications, and safety conditions in dealing with this radiation. • For the student to know what this science is, its history and fields, and to identify the relationship of applied sciences to this science. • Gain the ability to express ideas clearly and confidently in speech, work with confidence within the TEAMWORK group, analyze, investigate and gather information systematically and scientifically to establish facts and principles as a solution to a problem, motivation to work and the ability to take initiative, identify opportunities and develop ideas and solutions. • This course description provides a necessary summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made the most of the available learning opportunities. It must be linked to the program description.

13	2	Understanding the topic of the lecture	Laser Applications in Medicine, Laser Applications in Optical Communications, Laser Applications in Holography	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
14	2	Understanding the topic of the lecture	Laser Applications in Industry, Laser Applications in the Military, Laser Applications in Agriculture, Construction, and Roads, Laser Applications for Commercial Purposes	Lecture (attendance) + PDF (electronic)	Discussion and oral questions
15	2	Monthly exam	Monthly exam	Attendance	Attendance exam

11. Course Evaluation

Including topics that are in line with modernity and the requirements of scientific and practical life, and what scientists have achieved, on an ongoing basis.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Laser Physics and Some of Its Practical Applications / Author: Dr. Siham Afif Qandala.
Main references (sources)	Books and lectures published by Iraqi universities and reputable international universities.
Recommended books and references (scientific journals, reports...)	Books about laser physics.
Electronic References, Websites	The virtual electronic library, reliable internet references