Academic Program Description Form

University Name: Tikrit University

Faculty/Institute: College of Education for Girls

Scientific Department: Department of Chemistry

Academic or Professional Program Name: Bachelor's degree in Chemistry

Final Certificate Name: Bachelor's degree in Chemistry

Academic System: Annual/Courses

Description Preparation Date: 18/9/2025

File Completion Date: 18/9/2025

Signature:

Department Head's Name:
Dr. Ban Dawood Saleh
Date:

Signature:

Scientific Assistant's Name:
Dr. Ashraf Gamal Mahmoud
Date:

Review the file by: م. شهد خالد حميد
Quality Assurance and University Performance Department
Name of the Director of the Quality Assurance and University Performance:
Department:
Date: 7/10/2025
Signature:

Approval of the Dean

أ.د. نجلاء عبد الحسين احمد الراوي
عميد كلية التربية للبنات

1. Program Vision

1- Leadership and innovation in the field of conducting scientific experiments.
2- Elevating the level of the laboratory according to the needs of the students.
3- Equipping students with the theoretical and applied foundations and information in the field of chemistry and making them competent and capable of offering their expertise to serve the community.

2. Program Mission

1- Providing academic education and practical training in the field of scientific laboratories and equipping students with practical skills in line with international standards.
2- Elevating the level of the department according to the needs of the students.
3- Preparing a conscious generation of students who possess scientific and practical experience in the field of chemistry.
4- Training and preparing students on how to avoid risks to ensure chemical safety and security within the laboratory.

3. Program Objectives

1- Qualifying students technically and academically in the practical field and applications of chemistry laboratories.
2- Preparing students and establishing the foundations of chemistry for them.
3- Opening future prospects and attracting students towards the scientific and practical aspects in a better way.
4- Guiding students towards engaging with environmental problems around them and finding solutions to serve the community.
5- Playing an active and influential role in the fields of analysis and quality control.
6- Preparing a generation of qualified and competent teachers to join the education sector.

4. Program Accreditation

Is the program accredited? From which authority? No.

5. Other external influences

The School Application - Laboratory Practical Training
Theoretical and Practical Graduation Research Projects

6.Program Structure				
Program Structure	**Number of Courses**	**A study unit**	**Percentage**	**Notes**
Enterprise Requirements	**nothing**			
College Requirements	**nothing**			
Department Requirements	**40**	**180**	**10% first stage rate 20% second stage rate 30% third stage rate 40% stage four rate**	
Summer Training	**nothing**			
Others	**Watching and applying female students in schools**			

* Can include notes on whether the course is required or elective.

7.Program Description				
The year / level	Course code or course title	Course name or subject	Approved hours	
The first/preliminary stage	**nothing**	**Organic chemistry**	2	3
The first/preliminary stage	**nothing**	**Analytical chemistry**	2	3
The first/preliminary stage	**nothing**	**mathematics**	1	-
The first/preliminary stage	**nothing**	**Security and safety**	1	-
The first/preliminary stage	**nothing**	**Life sciences**	1	2
The first/preliminary stage	**nothing**	**Calculators**	1	-
The first/preliminary stage	**nothing**	**Human rights**	1	-
The first/preliminary stage	**nothing**	**Arabic**	1	-
The first/preliminary stage	**nothing**	**English language**	1	-
The first/preliminary stage	**nothing**	**Inorganic chemistry**	2	-
The first/preliminary stage	**nothing**	**Developmental and educational psychology**	2	-
The first/preliminary stage	**nothing**	**Fundamentals of education**	1	-
The second/initial stage	**nothing**	**Organic chemistry**	2	3
The second/initial stage	**nothing**	**Inorganic chemistry**	2	3
The second/initial stage	**nothing**	**Developmental psychology**	2	-
The second/initial stage	**nothing**	**Physical chemistry**	2	3
The second/initial stage	**nothing**	**Analytical chemistry**	2	3
The second/initial stage	**nothing**	**Calculators**	1	2
The second/initial stage	**nothing**	**Educational administration**	2	-
The second/initial stage	**nothing**	**mathematics**	2	-

The second/initial stage	**nothing**	**English language**	1	-
The third/initial stage	**nothing**	**Organic chemistry**	2	3
The third/initial stage	**nothing**	**Coordination chemistry**	2	3
The third/initial stage	**nothing**	**Physical chemistry**	2	3
The third/initial stage	**nothing**	**Biochemistry**	2	3
The third/initial stage	**nothing**	**Research methodology**	2	-
The third/initial stage	**nothing**	**Teaching methods**	2	-
The third/initial stage	**nothing**	**optional**	2	-
The third/initial stage	**nothing**	**Industrial chemistry**	2	-
The third/initial stage	**nothing**	**Educational guidance**	2	-
The third/initial stage	**nothing**	**English language**	1	-
The fourth/initial stage	**nothing**	**Biochemistry**	2	3
The fourth/initial stage	**nothing**	**Practical education (watch and apply)**	2	-
The fourth/initial stage	**nothing**	**Measurement and evaluation**	2	-
The fourth/initial stage	**nothing**	**Diagnosis**	2	3
The fourth/initial stage	**nothing**	**optional**	2	-
The fourth/initial stage	**nothing**	**Automated analysis**	2	3
The fourth/initial stage	**nothing**	**Quantum chemistry**	2	-
The fourth/initial stage	**nothing**	**English language**	1	-
The fourth/initial stage	**nothing**	**Industrial chemistry**	2	3

8.Expected learning outcomes of the program	
Knowledge	
1Learning Outcomes Cognitive Objectives **1-** Empowering students to acquire knowledge and overall intellectual understanding of chemistry. **2-** Empowering students to acquire knowledge and understanding of the laws of chemistry. **3-** Empowering students to acquire knowledge and understanding of chemistry in English. **4-** Empowering students to acquire knowledge and understanding of chemical analysis standards.	**1**Learning Outcomes Statement **1-** Empowering students to acquire knowledge of the basic principles of chemistry. **2-** Providing students with knowledge through homework assignments of study vocabulary.
Skills	
2 Learning Outcomes General Skills: **1-** Communication and Information Technology skills and developing strategies for teamwork. **2-** Proficiency in modern communication techniques, documentation, and communication with institutions and scientific centers.	**2-**Statement of Learning Outcomes Empowering students to solve problems that are relevant to their learning style in the lesson.

3- Possessing language skills (fluency in speaking, writing, and understanding Arabic and English) in the art of listening, persuasion, and dialogue. **4-** Problem-solving skills in education using educational and psychological programs and methods. **5-** Possessing leadership qualities, memory power, intuitive speed, and the ability to predict and infer	
3- Learning Outcomes Skills Objectives: **1 -** Scientific and practical skills. **2 -** Remembering and analytical skills. **3 -** Utilization and development skills.	**3-** Statement of Learning Outcomes Empowering students to solve problems related to teaching steps and employ the appropriate method.
The values	
Learning outcomes 4/ Daily and monthly exams	Learning outcomes statement 4/ Final exams
Learning outcomes 5/ Competitive grades for daily participation in the lesson	Learning outcomes statement 5/ Attendance and regularity grades in lectures
9. Teaching and Learning Strategies	
Providing students with the basics and topics related to knowledge and systems explained in: **1-** Clarifying and explaining the study materials by the academic staff through the whiteboard and Data Show. **2-** Providing students with knowledge through homework for study vocabulary. **3-** Encouraging students to visit the library to obtain academic knowledge related to study vocabulary. **4-** Improving students' skills by visiting electronic sites to obtain additional knowledge for study materials.	
10. Evaluation methods	
1- Daily tests with multiple-choice questions for academic subjects. **2-** Grades are assigned for challenging competitive questions for students. **3-** Grades are assigned for assigned homework. **4-** Quality and quantity practical tests in laboratories. **5-** Assigning students to conduct scientific seminars and discuss them.	
11. Faculty	
Faculty Members	

Academic Rank	Specialization		Special Requirements/Skills (if applicable)	Number of the teaching staff	
	General	Special		Staff	Lecturer
Prof	Organic chemistry	Organic chemistry	.	2	
Prof	Analytical chemistry	Analytical chemistry		1	
Prof	Biochemistry	Biochemistry		2	
assistant professor	Physical chemistry	Physical chemistry		2	

assistant professor	Organic chemistry	Organic chemistry		4	
Doctor teacher	Inorganic chemistry	Inorganic chemistry		1	
Doctor teacher	Analytical chemistry	Analytical chemistry		1	
Doctor teacher	Biochemistry	Biochemistry		1	
Teacher	Teaching methods	Teaching methods		1	
Teacher	Calculators	Calculators		1	
Assistant teacher	Analytical chemistry	Analytical chemistry		1	
Assistant teacher	Inorganic chemistry	Inorganic chemistry		1	
Assistant teacher	Organic chemistry	Organic chemistry		3	
Assistant teacher	law	law		1	

12.Acceptance Criterion

1- Acceptance based on the overall and central grade system.
2- Acceptance in departments based on student's preference and grade.
3- Condition that the student must be a graduate of preparatory study and scientific branch only.
4- The accepted student must have sound personal and mental health and be free from physical disabilities.
5- The capacity of the college's departments to accommodate students.

13. The most important sources of information about the program

1- The curriculum approved by the Ministry of Higher Education and Scientific Research and its guiding references.
2- Courses and recommendations from scientific committees at the university.
3- Courses in teaching methods.
4- Training courses organized by the college on e-learning platforms.

Program skills outline

5- Internet research for similar experiments.
6- Personal experiences.

14. Program Development Plan

1- Development of the curriculum through deletion, addition, and replacement.
2- Use of modern teaching methods according to the nature of the subject and the level of learners from time to time.
3- Use of modern evaluation methods such as alternative and electronic assessment.

Program Skills Outline															
Required program Learning outcomes															
Year/ Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
			Mandatory	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
The first		Organic chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Analytical chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		mathematics	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Security and safety	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Life sciences	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Computer	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Human rights	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Arabic	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		English language	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Inorganic chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Developmental and educational psychology	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
Second		Organic chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Inorganic chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Developmental psychology	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Physical chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Analytical chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Computer	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Educational administration	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		mathematics	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		English language	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
Third		Organic chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Coordination chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Physical chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Biochemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Research methodology	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Teaching methods	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*

		optional	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Industrial chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Educational guidance	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		English language	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
Fourth		Biochemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Practical education (watch and apply)	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Measurement and evaluation	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Diagnosis	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		optional	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Automated analysis	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Quantum chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		English language	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*
		Industrial chemistry	Mandatory	*	*	*	*	*	*	*	*	*	*	*	*

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

Course Description Form

1. Course Name:	
Inorganic chemistry / 1st year	
2. Course Code:	
3. Semester / Year:	
Annual / 2024-2025	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Class attendance + electronic classes (Google Classroom), which will be a supporting class for the in-person class, and according to the conditions and instructions of the Ministry of Higher Education and Scientific Research.	
6. Number of Credit Hours (Total) / Number of Units (Total)	
180 hours per year / 4 units	
7. Course administrator's name (mention all, if more than one name)	
Name:Assistant lecturer Noor Abdul Salam Mohammed Email: nmohammed@tu.edu.iq	
8. Course objectives	
Course objectives	• Providing students with knowledge of the principles of Atomic construction in Organic chemistry. • Developing students' ability by knowing the most important scientific concepts and rules that must be followed to understand the mechanisms of chemical reactions and how to control them. • Teaching students how to use and apply laws in the practical aspect. • Preparing students to practice the career of teaching chemistry in the academic institutions.
9. Teaching and Learning Strategies	
Strategy	1- Standard method (lectures). 2- Discussion and Questioning method. 3- practical method.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Nov. 3	4		The electronic structure of the atom, the nature of electromagnetic radiation. - Black body radiation, photoelectric effect, atomic spectra	Standard and practical method	Class performance and exams
Nov. 4	4		- Bohr's theorem, improved Bohr's theorem, Heisenberg's rule and the indeterminacy principle.	Standard and practical method	Class performance and exams
Des. 1	4		quantum numbers and energy levels.	Standard and practical method	Class performance and exams
Des. 2	4		Term symbols for atoms and ions in their steady state.	Standard and practical method	Class performance and exams
Des. 3	4		Periodic Table	Standard and practical method	Class performance and exams
Des. 4	4		Periodic properties of atoms - Blocking, atomic and ionic radii	Standard and practical method	Class performance and exams
Jan. 1	4		Tien energy, electron affinity, electronegativity	Standard and practical method	Class performance and exams
Jan. 2	4		Types of bonds and their nature - Ionic, covalent, harmonic, hydrogen, metallic, and Vander Waals forces.	Standard and practical method	Class performance and exams
Jan. 3	4		The structure of the crystal lattice.	Standard and practical method	Class performance and exams
Jan. 4	4		Diatomic molecules	Standard and practical method	Class performance and exams
Feb. 1	4		Equivalence squeeze theorem.	Standard and practical method	Class performance and exams
Feb. 2	4		Molecular Orbital Theory.	Standard and practical method	Class performance and exams
Feb. 3	4		Linear triatomic molecules	Standard and practical method	Class performance and exams
Feb.4	4		Molecules with a planar triangular shape	Standard and practical method	Class performance and exams
Mar. 1	6		Tetrahedral molecules, triangular pyramid molecules.	Standard and practical method	Class performance and exams
Mar. 2	6		Tetrahedral molecules, triangular pyramid molecules.	Standard and practical method	Class performance and exams
Mar/ 3	Spring holiday				
Mar. 4					

Apr. 1	6		angular triatomic molecules.	Standard and practical method	Class performance and exams
Apr. 2	6		angular triatomic molecules.	Standard and practical method	Class performance and exams
Apr. 3	6		Hybridization	Standard and practical method	Class performance and exams
Apr. 4	6		Hybridization	Standard and practical method	Class performance and exams
May. 1	6		Hybridization	Standard and practical method	Class performance and exams
May. 2	6		ionization in some organic molecules	Standard and practical method	Class performance and exams
May.3	6		ionization in some organic molecules	Standard and practical method	Class performance and exams
May. 4	6		ionization in some organic molecules	Standard and practical method	Class performance and exams
Jon 1	6		General Review	Standard and practical method	Class performance and exams

11. Course Evaluation
1- Formative evaluation through daily exams, observing the student's performance in class discussions and homework assignments, and classroom evaluation. This grade does not exceed 20% of the total. 2- Diagnostic evaluation by semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) semester exams during the year, that is, two exams for each semester, to extract the annual quest before entering the final exams.

12. Learning and Teaching Resources	
Required textbooks	'Inorganic Chemistry'' Book S1 Dr. Bassem Saadi - Inorganic Chemistry S1 Dr. Noman Al-Nuaimi and his group
Main references (sources)	
Recommended books and references (scientific journals, reports …)	Access to everything that is current and published in peer-reviewed scientific journals
Electronic References, Websites	https://scholar.google.com/ https://www.sciencedirect.com/ https://www.researchgate.net/

Course Description Form

1. Course Name:	
Organic Chemistry / first Stage	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. MOHAMMED GAZEE ABED ALKAREEM Email: mgchemo@tu.edu.iq	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. 2- Encouraging students to acquire knowledge and information and the ability to draw conclusions. 3- Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure					
Week	Hours	Required learning outcomes	Unit or topic name	Learning method	Evaluation method
October 1	2	Presentation method Discussion method	General properties of alkanes	Standard method, practical method	Grades and exams
October 2	2	Presentation method Discussion method	Synthese of alkanes	Standard method, practical method	Grades and exams
October 3	2	Presentation method Discussion method	Reactions of alkanes	Standard method, practical method	Grades and exams
October 4	2	Presentation method Discussion method	General properties of alkenes	Standard method, practical method	Grades and exams
November1	2	Presentation method Discussion method	Synthese of alkenes	Standard method, practical method	Grades and exams
November2	2	Presentation method Discussion method	Reactions of alkenes	Standard method, practical method	Grades and exams
November3	2	Presentation method Discussion method	General properties of alkynes	Standard method, practical method	Grades and exams
November4	2	Presentation method Discussion method	Synthese of alkynes	Standard method, practical method	Grades and exams
December1	2	Presentation method Discussion method	Reactions of alkynes	Standard method, practical method	Grades and exams
December 2	2	Presentation method Discussion method	General properties of alcohol	Standard method, practical method	Grades and exams
December 3	2	Presentation method Discussion method	Synthese of alcohol	Standard method, practical method	Grades and exams
December 4	2	Presentation method Discussion method	Reactions of alcohol	Standard method, practical method	Grades and exams
January 1	2	Presentation method Discussion method	Exam 1	Standard method, practical method	Grades and exams
January 2	2	Presentation method Discussion method	General properties of halide alkyl	Standard method, practical method	Grades and exams
January 3	2	Presentation method Discussion method	Synthese of halide alkyl	Standard method, practical method	Grades and exams
January 4			Reactions of halide alkyl		
February 1	2	Presentation method Discussion method	General properties of alkanes	Standard method, practical method	Grades and exams
February 2	2	Presentation method Discussion method	Synthese of alkanes	Standard method, practical method	Grades and exams
March 1	2	Presentation method Discussion method	Reactions of alkanes	Standard method, practical method	Grades and exams
March 2	2	Presentation method Discussion method	Exam 2	Standard method, practical method	Grades and exams

March 3	2	Presentation method Discussion method	General properties of alkanes	Standard method, practical method	Grades and exams
March 4	2	Presentation method Discussion method	Synthese of alkanes	Standard method, practical method	Grades and exams
April 1	2	Presentation method Discussion method	Reactions of alkanes	Standard method, practical method	Grades and exams
April 2	2	Presentation method Discussion method	Exam 3	Standard method, practical method	Grades and exams
April 3	2	Presentation method Discussion method	General properties of amines	Standard method, practical method	Grades and exams
April 4	2	Presentation method Discussion method	Synthese of amines	Standard method, practical method	Grades and exams
May 1	2	Presentation method Discussion method	Reactions of amines	Standard method, practical method	Grades and exams
May 2	2	Presentation method Discussion method	Aromatic compounds	Standard method, practical method	Grades and exams
May 3			Exam 4		
May 4			General review	Problem-solving method	
May 15					

11. Course Evaluation	
Distribution of grades out of 100 according to tasks assigned to the student such as daily attendance, daily and monthly exams, reports, etc.	
12. Learning and Teaching Resources	
Required textbooks (methodology if available)	Foundations of organic chemistry
Main references (sources)	Morisson and boyd
Recommended supplementary books and references (scientific journals, reports...)	
Electronic references, internet sites	

Course Description Form

1. Course Name:
Analytical chemistry / 1st year
2. Course Code:
3. Semester / Year:
Annual / 2025-2026
4. Description Preparation Date:
18/9/2025
5. Available Attendance Forms:
Class attendance + electronic classes (Google Classroom), which will be a supporting class for the in-person class, and according to the conditions and instructions of the Ministry of Higher Education and Scientific Research.
6. Number of Credit Hours (Total) / Number of Units (Total)
120 hours per year / 6 units
7. Course administrator's name (mention all, if more than one name)
Name: Lecture Dr. Marwan Thaer Jalal Email: marwan.analytical@tu.edu.iq
8. Course objectives

Course objectives	• Providing students with knowledge of the principles of analytical chemistry one of the basic branches of chemistry. • Developing students' ability by knowing the most important scientific concepts and rules that must be followed to understand the mechanisms of chemical reactions and how to control them. • Teaching students how to use and apply laws in the practical aspect. • Preparing students to practice the career of teaching chemistry in the academic institutions.
9. Teaching and Learning Strategies	
Strategy	1. Standard method (lectures). 2. Discussion and Questioning method. 3. practical method.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Sep. 3	**6**	Elocution and Discussion Methods	Introduction of Analytical chemistry	Standard and practical method	Class performance and exams
Sep. 4	**6**	Elocution and Discussion Methods	Introduction of Qualitative, Quantitative and Separation methods	Standard and practical method	Class performance and exams
Oct. 1	**6**	Elocution and Discussion Methods	Review of elementary concepts	Standard and practical method	Class performance and exams
Oct. 2	**6**	Elocution and Discussion Methods	The chemical composition of solution, strong and weak electrolytes	Standard and practical method	Class performance and exams
Oct. 3	**6**	Elocution and Discussion Methods	The dissociation of water	Standard and practical method	Class performance and exams
Oct. 4	**6**	Elocution and Discussion Methods	Acids and bases	Standard and practical method	Class performance and exams
Nov. 1	**6**	Elocution and Discussion Methods	Important weight and concentration terms, unit of weight, methods for expression of concentration	Standard and practical method	Class performance and exams
Nov. 2	**6**	Elocution and Discussion Methods	Stoichiometric relationships	Standard and practical method	Class performance and exams
Nov. 3	**6**	Elocution and Discussion Methods	Chemical equilibrium	Standard and practical method	Class performance and exams
Nov. 4	**6**	Elocution and Discussion Methods	The scope of analytical chemistry	Standard and practical method	Class performance and exams
Des. 1	**6**	Elocution and Discussion Methods	The importance of analytical chemistry	Standard and practical method	Class performance and exams
Des. 2	**6**	Elocution and Discussion Methods	Classification of methods	Standard and practical method	Class performance and exams
Des. 3	**6**	Elocution and Discussion Methods	Quantitative analysis	Standard and practical method	Class performance and exams

Des.4	6	Elocution and Discussion Methods	Steps in the determination	Standard and practical method	Class performance and exams
Jan. 1	6	Elocution and Discussion Methods	Concentration	Standard and practical method	Class performance and exams
Jan. 2	6	Elocution and Discussion Methods	Acid base equilibria pH calculations	Standard and practical method	Class performance and exams
Jan/ 3	Spring holiday				
Jan. 4					
Feb. 1	6	Elocution and Discussion Methods	Buffer solution, preparation and mixture	Standard and practical method	Class performance and exams
Feb. 2	6	Elocution and Discussion Methods	An introduction to volumetric methods of analysis	Standard and practical method	Class performance and exams
Feb. 3	6	Elocution and Discussion Methods	Reaction types of volumetric analysis	Standard and practical method	Class performance and exams
Feb. 4	6	Elocution and Discussion Methods	Standard solution and primary solution	Standard and practical method	Class performance and exams
Mar. 1	6	Elocution and Discussion Methods	Volumetric calculations and end point	Standard and practical method	Class performance and exams
Mar. 2	6	Elocution and Discussion Methods	Precipitation titrations	Standard and practical method	Class performance and exams
Mar.3	6	Elocution and Discussion Methods	Titration Curve	Standard and practical method	Class performance and exams
Mar. 4	6	Elocution and Discussion Methods	Theory of neutralization titration of simple systems	Standard and practical method	Class performance and exams
Apr. 1	6	Elocution and Discussion Methods	Theory of neutralization titration of complex systems	Standard and practical method	Class performance and exams
Apr. 2	6	Elocution and Discussion Methods	Volumetric methods based on complex formation methods	Standard and practical method	Class performance and exams
Apr. 3	6	Elocution and Discussion Methods	Equilibrium in oxidation – reduction systems	Standard and practical method	Class performance and exams
Apr. 4	6	Elocution and Discussion Methods	An introduction to volumetric methods of analysis	Standard and practical method	Class performance and exams

May 1	6	Elocution and Discussion Methods	Reaction types of volumetric analysis	Standard and practical method	Class performance and exams
May 2	6	Elocution and Discussion Methods	Standard solution and primary solution	Standard and practical method	Class performance and exams
May 3	6	Elocution and Discussion Methods	Volumetric calculations and end point	Standard and practical method	Class performance and exams
May 4	6	Elocution and Discussion Methods	Precipitation titrations	Standard and practical method	Class performance and exams
June 1			Final Exams		

11. Course Evaluation

1. Formative evaluation through daily exams, observing the student's performance in class discussions and homework assignments, and classroom evaluation. This grade does not exceed 20% of the total.
2. Diagnostic evaluation by semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) semester exams during the year, that is, two exams for each semester, to extract the annual quest before entering the final exams.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Student solutions manual Fundamentals of Analytical chemistry, 2013. Douglas A. Skoog, Stanford university. Donald M. west, San Jose state university. F. James Holler, university of Kentucky. Stanley R. Crouch, Michigan state university.
Main references (sources)	1-Foundations of Analytical Chemistry: Written by Dr. Moayad Qasim Al-Abaiji and Dr. Thabet Saeed Al-Ghabsha, 1986. 2-Descriptive and volumetric analysis: written by Dr. Thabet Saeed Al-Ghabsha and Dr. Moayed Qasim Al-Abaiji, 1989. 3-Theoretical foundations of inorganic analytical chemistry, quantitative gravimetric and volumetric analysis: written by Dr. Hadi Kazem Awad and others, 1986. 4- Journal of Analytical Chemistry. 5-Journal of Chemical Africa. 6-Talanta.
Recommended books and references (scientific journals, reports …)	Access to everything that is current and published in peer-reviewed scientific journals
Electronic References, Websites	1-Chemistry Dictionary. 2-Material Safety Data Sheet. 3-The Merck Index. 4-Publisher Springer https://www.Sprenger.com/. 5-Publisher Elsevier https://www.Scopus.com/. 6-Google Scholar https://scholar.google.com/. 7-Academia https://www.Academia.com/ 8-Research Gate https://www.researchgate.net/. 9- Science Direct https://www.sciencedirect.com/.

Course description form

1. Course name	
Foundations of education	
2. Course code	
The first stage	
3. Semester/year	
The year is 2025 -2026	
4. The date this description was prepared	
18/9/2025	
5. Available forms of attendance	
Attend my class + electronic class ongoogle classroomIt will be a supporting class for the attendance class according to the controls and instructions of the Ministry of Higher Education and Scientific Research	
6. Number of study hours (total) / number of units (total)	
2 hours per week = 60 hours / units 2 units	
7. Name of the course administrator (if more than one name is mentioned)	
Name: M. Intisar Modheher Khiro Email:Intisar.modheher @tu.edu.iq	
8. Course objectives	
1. It aims to make students know the general foundations and principles on which education is based by reviewing a group of foundations such as the historical, social, economic and scientific foundations. 2. Developing values in Arab and Islamic education 3. Teaching female students the skills of researching education throughout history	Objectives of the study subject
9. Teaching and learning strategies	
Standard method (lectures) • Method of discussion and interrogation • Method of solving problems	The strategy

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Achievement tests	Lecture and discussion	Foundations of education	Educational and psychological sciences	2	September -3
=	=	The meaning of education and the goals of education	=	2	September-4
=	=	The necessities and importance of education	=	2	October 1
=	=	Educational theories	=	2	October 2
=	=	Fields of education	=	2	October 3
=	=	Historical basis	=	2	October 4
=	=	Development of the foundations of education	=	2	November 1
=	=	Education in primitive societies	=	2	November 2
=	=	Chinese education	=	2	November 3
=	=	Greek	=	2	November 4
=	=	Arab Islamic education	=	2	December 1
=	=	Education in the pre-Islamic era	=	2	December 2
=	=	Media of Arab educational thought / Ibn Khaldun	=	2	December3
=	=	A younger son	=	2	December 4
=	=	Al-Ghazali	=	2	January 1
=	=	Modern Education /	=	2	January 2

		Jean-Jacques Rousseau			
=	=	John Dewey	=	2	February 1
=	=	Social basis	=	**2**	February 2
=	=	The relationship of education with society	=	**2**	February 3
=	=	The relationship of education to the environment	=	**2**	February 4
=	=	Congenital education	=	**2**	The application period is (45) days from 3/1/2024 until 4/15/2024.
=	=	Health education	=	**2**	April 3
=	=	Family education	=	**2**	April 4
=	=	Economic basis	=	**2**	May 1

11. Course evaluation	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. The degree is distributed through several channels: 1- Formative (formative) assessment through daily exams, observing and following up on the student's performance in class discussions and homework assignments, and classroom evaluation. Her grade does not exceed 20% of the total. 2- Diagnostic evaluation of the semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) exams for each semester, two exams, to extract the annual endeavor before entering the final exams.	
12. Learning and teaching resources	
Foundations of education	Required textbooks (methodology, if any)
Books on history, sociology, and economics	Main references (sources)
Educational philosophies-Educational meeting	Recommended supporting books and references (scientific journals, reports...)
Educational and psychological websites	Electronic references, Internet sites

Course Description Form

1. Course Name:
Computer (computer basics)
2. Course Code:
3. Semester / Year:
2025-2026/ First Year
4. Description Preparation Date:
18/9/2025
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours: 30 hours theoretical hours (1 theoretical hour per week) & classroom : https://classroom.google.com/c/ODA5MjY3OTEwMDU3?cjc=zfh7re5q
7. Course administrator's name (mention all, if more than one name)
Name: Lecturer Areej Ali Hussein Al-Rasheed email : areej.ali@tu.edu.iq
8. Course Objectives
This course aims to provide the student with : • Providing the student initially with the main concepts of computer use, its basic applications, the main components of the computer, computer software (its hardware and software components), computer networks, the Internet, basic issues when using information and communications technology, related concepts, how to represent and process data, and computer operating systems. • Providing the student with the basic skills in dealing with some Microsoft Office package progra using the Windows 10 operating system, windows, icons, the mouse, and keyboard, dealing with fi computer settings, and the printer. Then the student moves on to learning to create documents us programs (the text editing program known as Word, the program for creating tables, and the program presentations), and using programs for copying and downloading files, playing videos, etcProviding student with the skills to deal with the Internet, its most important services, computer networks, t protection, and how to benefit from them, so that the student can use the computer and the Internet in academic and professional life in the future efficiently and effectively.

9. Teaching and Learning Strategies	
Strategy	• The standard (lecture) method for lecture topics, relying on approved sources. • Explanation and clarification using the fraud device. • Discussion, asking questions, dialogue, and psychological description. • Small group teaching and follow-up questions. • Conduct research and reports on the topics of determining courses and discussing reports and appropriations within the evaluation. • Using e-learning and e-learning, and using educational tools as teaching aids and educational films via the Classroom electronic platform. • Self-learning method by supporting a role-centered learning environment to encourage students to take responsibility for realizing their own goals and adapting to new challenges in the world of knowledge and intellectual and cultural development.

10.Course structure

Course level : First year

Course Name: Computer (computer basics)

Evaluation methods	Learning methods	Subjects name	Learning methods outcomes	Hours	Weeks
Class performance and exams	Standard method And discussion	Chapter One: Introduction to computers	Introduction to the computer and the stages of its development over time - computer features and areas of use - Hardware and software concepts and their components	1	1
Class performance and exams	Standard method And discussion	Chapter One: Introduction to computers	؟The concept of computing, data and information - Applications of information electronics and communication technology (IECT) - Connecting input/output devices, and peripherals to CPU	1	2
Class performance and exams	Standard method And discussion	Chapter Two : Computer Components	Computer components and physical parts - Computer Portions – Hardware Parts	1	3
Class performance and exams	Standard method And discussion	Chapter Two : Computer Components	I/O Units	1	4
Class performance and exams	Standard method And discussion	Chapter Two : Computer Components	Memory Types, Basic CPU Components	1	5
Class performance and exams	Standard method And discussion	Chapter Two : Computer Components	Computer Ports, Personal computer, Personal Computer (Features and Types)	1	6
Class performance and exams	Standard method And discussion	Chapter Three: Operating System and Graphical User Interface UI	Operating System; Basics of Common operating Systems	1	7
Class performance and exams	Standard method And discussion	Chapter Three: operating System and Graphical User Interface UI	The User Interface, Using Mouse Techniques; Use of Common Icons	1	8

Class performance and exams	Standard method And discussion	Chapter Three: operating System and Graphical User Interface UI	Status Bar - Using Menu and Menu-selection	1	9
Class performance and exams	Standard method And discussion	Chapter Three: operating System and Graphical User Interface UI	Concept of Folders and Directories, Opening and closing of different Windows - Creating Short cuts	1	10
Class performance and exams	Standard method And discussion	Chapter Four: Word Processing	Word Processing Basics - Opening and Closing of documents	1	11
Class performance and exams	Standard method And discussion	Chapter Four: Word Processing	Text creation and Manipulation - Formatting of text	1	12
Class performance and exams	Standard method And discussion	Chapter Four: Word Processing	Table handling - Spell check	1	13
Class performance and exams	Standard method And discussion	Chapter Four: Word Processing	language setting and thesaurus - Printing of word document	1	14
First semester exam					15
Mid-year holiday					16
Class performance and exams	Standard method And discussion	Chapter Five: Spread Sheet	Basics of Spreadsheet; Manipulation of cells	1	17
Class performance and exams	Standard method And discussion	Chapter Five: Spread Sheet	Formulas and Functions		18
Class performance and exams	Standard method And discussion	Chapter Five: Spread Sheet	Editing of Spread Sheet,	1	19
Class performance and exams	Standard method And discussion	Chapter Five: Spread Sheet	Printing of Spread Sheet		20
Class performance and exams	Standard method And discussion	Chapter Six: Presentation Software (Power Point)	Basics of presentation software	1	12
Class performance and exams	Standard method And discussion	Chapter Six: Presentation Software (Power Point)	Creating Presentation		22
Class performance and exams	Standard method And discussion	Chapter Six: Presentation Software`	Preparation and Presentation of Slides - Slide Show	1	23
Class performance and exams	Standard method And discussion	Chapter Six: Presentation Software (Power Point)	Taking printouts of presentation / handouts		24
Class performance and exams	Standard method And discussion	Chapter Seven: Introduction to Internet and Web Browsers	Computer networks Basic; LAN, WAN - Concept of Internet and its Applications; connecting to internet; World Wide Web	1	25
Class performance and exams	Standard method And discussion	Chapter Seven: Introduction to Internet and Web Browsers	Web Browsing software's, Search Engines; Understanding URL; Domain name; IP Address	3	26

Class performance and exams	Standard method And discussion	Chapter Eight: Communications and Emails	Basics of electronic mail; Getting an email account; Sending and Receiving Emails	3	27
Class performance and exams	Standard method And discussion	Chapter Eight: Communications and Emails	Accessing sent emails; Using Emails; Document collaboration	3	28
Class performance and exams	Standard method And discussion	Chapter Nine: Computer Troubleshooting	Identifying and solving common hardware and software problems that computer users encounter	3	29
	Standard method And discussion	Chapter Nine: Computer Troubleshooting	Basic troubleshooting techniques and tools for diagnosing and resolving issues	3	30
Second semester exam					

1. Course Evaluation	
Score distribution out of 100, divided as follows: - 50 marks for annual follow-up, divided into 25 marks for the first semester, 25 marks for the second semester (the student seeks to obtain 50 marks annually for the monthly and daily tests for the first semester and for the second semester) The semester, which includes various elements, including the student (semester exam + Reports + Daily Assignments + Academic Assignments + Other Activities) - 50 marks for the final exam	
2. Learning and Teaching Resources	
Required textbo (curricular books, if ar	• Al-Khader Ali Al-Khader, "Computer Basics" 2016 • Adel Abdel Nour, "Introduction to the World of Artificial Intelligence," 2005. • Subject lecture's notes.
Main references (sourc	• Computer basics and office applications, Part One - Ministry of Higher Education and Scientific Research - Department of Research and Development
Recommended books and references (scientific journals, reports...)	• Bakro, Khaled (2018). Computer Fundamentals, Shuaa Publishing and Science, Halab - Syria, First edition. • Ali, Abdullah Mahdi (1998). Computer and the Modern Method, Dar Alam al-Kutub for Publishing and Distribution, first edition. • Rihawi, Mahmoud (1998). Personal Computer User Guide, Shuaa Publishing and Sciences, first edition. • Al-Qadi, Ziad (2007). Operating Systems, Dar Al Maysarah. • The Arab Encyclopedia of Computers and the Internet. • Graham Brown, David Watson, "Cambridge IGCSE Information and Communication.Technology", 3rd Edition (2020). • Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology In Action Complete" ,16th Edition (2020). • Ahmed Banafa, "Introduction to Artificial Intelligence (AD", 1st Edition (2024).
Electronic Referenc Websites	• http://21za.com/computer/first_about_computer.htm • http://www.opendirectorysite.info • http://ar.wikipedia.org/wiki • http://www.vercon.sci.eg/Matrials/2_1.html#menu • Operating System Share by Groups for Sites in All Locations January 2009. • Operating system Concepts (Seventh Edition): Abraham Silberschatz, Peter Baer Galvin, Greg Gagne

Course description form

1. Course name
Educational psychology, first stage
2. Course code
3. Semester/year
Year 2025-2026
4. The date this description was prepared
18/9/2025
5. Available forms of attendance
Attend my class + electronic class onGoogle Class Room will be a support class for the attendance class and according to the controls and instructions of the Ministry of Higher Education and Scientific Research.
6. Number of study hours (total) / number of units (total)
2 hours per week = 60 hours / units 2 units
7. Name of the course administrator (if more
Name: **M. M. Saood Rajab Hassan** **Email saood.r@tu.edu.iq**
From a name mentioned)

8. Course objectives	
The curriculum aims to prepare students to practice the teaching profession by learning about: 1- Learn about educational psychology, style, motivation, and sensory perception. 2- Learn about the types of educational psychology. 3- How to formulate behavioral goals. 4 - Knowledge of educational schools. 5 - The importance of educational applications of learning theories.	Objectives of the study subject
9. Teaching and learning strategies	
The standard method (giving lectures). 1 - Lecture method. 2 - The method of discussion and interrogation. 3 –Brainstorming method.	The strategy

10. Course structure:The study began on 9/17/2023 and ends on 5/19/2024, the start date of final exams.

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Class performance and exams	**Lecture method**	**Definition of educational psychology**		2	November 1
Class performance and exams	**Discussion and questioning**	**Educational psychology stage**		2	November 2

Class performance and exams	**Discussion and questioning**	**Arab Islamic philosophy**		2	November 3
Class performance and exams	Brainstorming	Modern philosophy		2	November 4
Class performance and exams	**Discussion and questioning**	Definition of psychology, its goals and importance		2	December1
Class performance and exams	**Discussion and questioning**	Treads of psychology		2	December2
Class performance and exams	**Discussion and questioning**	Branches of psychology		2	December 3
Class performance and exams	**Discussion and questioning**	Applied direction		2	December4
Class performance and exams	**Discussion and questioning**	Behavior and the factors affecting it		2	January1
Class performance and exams	Problem Solving	The effect of genetics on behavior		2	January2
Class performance and exams	**Discussion and questioning**	Interaction between genetics and environment		2	January3
Class performance and exams	**Discussion and questioning**	Research methods in educational psychology		2	January4
Class performance and exams	**Discussion and questioning**	**The importance of psychology in the educational process**		2	February1
Class performance and exams	**Discussion and questioning**	Educational goals		2	February2
		Spring break		2	February3
Class performance and exams	**Discussion and questioning**	Factors affecting the teaching and learning process		2	February4
Class performance and exams	**Discussion and questioning**	Attention and sensory perception		2	March1
Class performance and exams	**Discussion and questioning**	Types of attention and factors affecting it		2	March2
Class performance and exams	**Discussion and questioning**	Sensory perception		2	March3
Class performance and exams	**Discussion and questioning**	Factors affecting sensory perception		2	March4
Class performance and exams	**Discussion and questioning**	Learning theories		2	April1

		(conditional learning theory)			
Class performance and exams	**Discussion and questioning**	Clairvoyance theory		2	April2
Class performance and exams	**Discussion and questioning**	Transfer learning effect		2	April3
Class performance and exams	**Discussion and questioning**	Types of transition		2	April4
Class performance and exams	**Discussion and questioning**	How to benefit from transfer in the learning process		2	May1
Class performance and exams	**Discussion and questioning**	Feedback		2	May2
Class performance and exams	**Discussion and questioning**	Types of feedback		2	May3
		Review		2	May4

11. Course evaluation	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. **The degree is distributed through several channels:** 1- **Formative (formative) assessment through daily exams, observing and following up on the student's performance in class discussions and homework assignments, and classroom evaluation. Her grade does not exceed 20% of the total.** 2- **Diagnostic evaluation of the semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) exams, each semester with two exams, to extract the annual endeavor before entering the final exams.**	
12. Learning and teaching resources	
Educational Psychology, written by Dr. Raouf Mahmoud Al-Qaisi.	Required textbooks (methodology, if any)
1 - Educational Psychology Dr. Fouad Abu Hatab. 2 –**Educational Psychology Dr.**Rashid Marzouq Rashid. 3 -**Educational Psychology Dr. Hanaa Hussein Al-Felfali.**	Main references (sources)
Access to everything that is current and published in peer-reviewed scientific journals	Recommended supporting books and references (scientific journals, reports...)
http://www.alkutubcafe.com/book/83rjar.html	Electronic references, Internet sites

Course Description Form

1. Course name: Human Rights and Democracy/ First stage/ Chemistry Department	
2. Course code	
3. Semester/Year 2025- 2026	
4. Date of preparation of this description 9/18/2025	
5. Available forms of attendance/Class attendance + Online class onGoogle Classroom is a support class for the in-person class, according to the regulations and instructions of the Ministry of Higher Education and Scientific Research.	
6. Number of study hours (total) 17 / Number of units (total) 1	
7. Name of the course administrator (if more than one name is mentioned)	
Name: M.M. Farouk Aziz Kurdi Email: Farooq.azeez@tu.edu.iq	
8. Course objectives	
• Students should learn about the historical roots of human rights and the basic constants of human rights established by the true Islamic religion and international laws and agreements. • Students will learn about the real reasons behind the enactment of laws and declarations related to human rights. • Clarifying the concepts of rights, freedom, and duties of the individual and society, and explaining the articles related to human rights in the Iraqi Constitution. • Optimal preparation for a competent generation with a high level of knowledge about human rights and democracy.	Subject objectives

9. Teaching and learning strategies					
			Strategy		
10. Course Structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	Watches	The week
					October (1) October (2) October (3) October (4)
Classroom performance and exams	Standard method, text method	11/30/2025 Human rights in Greek and Egyptian civilizations	The first lecture	Start of work 1	November (1) November (2) November (3) November (4)
Classroom performance and exams Classroom performance and exams	Standard method Text method Standard method Text method	Human rights in divine laws and religions Human rights sources		1 1	December (1) December (2)
Classroom performance and examsT	Discussion and interrogation method	Human rights guarantees at the domestic level		1	December (3)
			First month exam	1	December (4)
Classroom performance and exams	Discussion and interrogation method	Human rights guarantees in Islam		1	January (1)
Classroom performance and exams	Discussion and interrogation method	Human rights guarantees at the international level		1	January (2)
Classroom performance and exams	Discussion and interrogation method	European Convention on Human Rights		1	January (3)
Classroom performance and exams	Discussion and interrogation method	Human and child rights, the emergence and development of		1	January (4)

		child rights rules			
			Second month exam		February (1)
Classroom performance and exams	Discussion and interrogation method	Children's rights in Roman civilization		1	February (2)
			Starts on Saturday 17/2/2026and ends on Thursday 24/2/2026	Spring break	February (3)
Classroom performance and exams	Discussion and interrogation method	Children's rights in Islam		1	February (4)
Classroom performance and exams	Discussion and interrogation method	Democracy		1	March (1)
			First exam after the first half	1	March (2)
Classroom performance and exams	Discussion and interrogation method	The emergence of Marxist ideology		1	March (3)
Classroom performance and exams	Discussion and interrogation method	Democracy between universality and privacy		1	March (4)
Classroom performance and exams	Method of discussion, dialogue and interrogation	Forms of democracy		1	April (1)
			Second exam		April (2)
Classroom performance and exams	Discussion and interrogation method	Representative system and its nature		1	April (3)
Classroom performance and exams	Discussion and interrogation method	Internal regulations of the House of Representatives (House of Representatives)		1	April (4)

			Third exam	1	Mays(1)
	Problem solving method	General review of human rights		1	Mays (2)
			Final exams		Mays (3) (4)

11. Course Evaluation	
The grade is distributed out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, reports, etc. 50 annual pursuit points, distributed 25 for each semester and divided as follows. 20 marks for the monthly exam. 5 points for daily activities. 50 marks for the end of the academic year exam.	
12. Learning and teaching resources	
The book Democracy: Concepts and Experiences by Dr. Hassan Latif Al-Zubaidi and Professor Nimah Muhammad Al-Abbadi Dr. Mohamed Abdel-Jabri, Democracy and Human Rights Muhammad Al-Zuhayli, Human Rights in Islam	Required textbooks (methodology if any)
	Main References (Sources)
	Recommended supporting books and references (scientific journals, reports...)
Universal Declaration of Human Rights	Electronic references, websites

Course Description Form

1. Course Name:

Analytical Chemistry

2. Course Code:

Second Year

3. Semester / Year:

Annual Course

4. Description Preparation Date:

2025/9/18

5. Available Attendance Forms:

In-person

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

120 hours / 6 units

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

Name: Lecture Dr. Marwan Thaer Jalal
Email:
marwan.analytical@tu.edu.iq

8. Course Objectives

- Provide a general understanding of the fundamentals of quantitative gravimetric analysis, sample selection, and laboratory processing. This includes knowledge of precipitation methods, properties of precipitates, solubility, weight factor calculations, and the mechanics of precipitates, along with understanding contaminants that accompany precipitates and how to treat them. Additionally, the course covers physical and chemical separation methods.
- Prepare competent and specialized personnel in analytical chemistry.
- Equip students with modern methods used to convey curriculum content effectively.

9. Teaching and Learning Strategies

- Inductive (deductive) method
- Problem-solving approach
- Organizing training courses and seminars to build students' ability to engage with the community, conduct productive dialogue, and solve educational problems through practical methods.
- Classroom interaction and exchanging opinions between students and instructors to discuss learning difficulties and potential solutions.

10. Course Structure

week	Hours	Expected Learning Outcomes	Unit/Topic Name	Learning Method	Assessment Method
October 1	5	Introduction to Analytical Chemistry	General introduction to gravimetric analysis and basic principles	Standard Method, Scientific Method	Class performance and exams
October 2	5	Classification of Gravimetric Methods	Gravimetric methods: volatilization, precipitation, separation based on chemical reactions	Standard Method, Scientific Method	Class performance and exams
October 3	5	Steps of Gravimetric Analysis	Steps in gravimetric analysis, characteristics of precipitates used	Standard Method, Scientific Method	Class performance and exams
October 4		Organic and Inorganic Precipitates	Organic and inorganic precipitants and their required conditions	Standard Method, Scientific Method	Class performance and exams
November 1	5	Solubility	Solubility, solubility product	Standard Method, Scientific Method	Class performance and exams
November 2	5	Applications of Solubility Product	Solubility applications in precipitation, examples, and problems	Standard Method, Scientific Method	Class performance and exams
November 3	5	Factors Affecting Solubility	Temperature effects, solvent effects, hydrolysis effects of slightly soluble salts, examples	Standard Method, Scientific Method	Class performance and exams
November 4	5	Influencing Factors on Solubility	Common ion, pH effects, complex ion effects, examples and problems	Standard Method, Scientific Method	Class performance and exams
December 1	5	Midterm Exam - First Semester	First semester exam	Standard Method, Scientific Method	Class performance and exams
December 2	5	Chemical Composition of Precipitates	Precipitates' chemical composition	Standard Method, Scientific Method	Class performance and exams
December 3	5	Calculating Weight Factors	Weight factor calculations	Standard Method, Scientific Method	Class performance and exams
December 4	5	Crystal Formation of Precipitates	Particle size, relative supersaturation, precipitation stages, crystal size	Standard Method, Scientific Method	Class performance and exams
January 1	5	Colloidal Precipitates	Colloidal state, agglomeration, homogeneous precipitation	Standard Method, Scientific Method	Class performance and exams
January 2	5	Contaminants in Precipitates	Types of precipitate contamination and treatment methods	Standard Method, Scientific Method	Class performance and exams
January 3	5	Precipitate Preparation	Digestion, washing, reprecipitation, drying or ignition, weight estimation	Standard Method, Scientific Method	Class performance and exams
January 4	5	Second Semester Exam	Second semester exam		
February 1	5	Separation Methods	General overview of separation methods, errors associated	Standard Method, Scientific Method	Class performance and exams

February 2	5	Solvent Extraction	Solvent extraction, distribution ratio, partition coefficient	Standard Method, Scientific Method	Class performance and exams
March 1	5	Percentage Extraction Calculations	Percentage extraction, separation efficiency, influencing factors	Standard Method, Scientific Method	Class performance and exams

11. Course Assessment

- Formative Assessment: This includes daily exams, observing student performance in class discussions and homework assignments, and overall classroom assessment. This accounts for a maximum of 20% of the total grade.
- Diagnostic Assessment: This is conducted through midterm and final exams to determine pass/fail status, accounting for 80% of the grade. It is divided into four midterm exams throughout the year, plus two practical exams (one for each semester) to calculate the annual score before the final exams.

12. Learning and Teaching Resources

Required Textbooks (if available)	• Foundations of Analytical Chemistry, by Dr. Moayed Qassim Al-Abayji and Dr. Thabit Said Al-Ghabsha, University of Mosul, 1983. • Analytical Chemistry: Separation Methods, by Dr. Samir Abdul Rahim Said and Dr. Thabit Said Al-Ghabsha, University of Mosul, 1985.
Main References (sources):	• Analytical Chemistry, by Gary Christian, Sixth Edition. • Chemical Analysis: Modern Instrumentation Methods and Techniques, by Francis Rouessac and Annick Rouessac, Second Edition. • Modern Analytical Chemistry, by David Harvey.
Recommended Supporting Books and References (scientific journals, reports, etc.):	http://www.chemicalprocessing.com
Electronic References and Websites:	http://www.bytoco.com

Course Description Form

10. Course Name:
Advanced Computing
11. Course Code:
12. Semester / Year:
2025-2026/ Second Year
13. Description Preparation Date:
18/9/2025
14. Available Attendance Forms:
Attendance
15. Number of Credit Hours (Total) / Number of Units (Total)
30 hours: 30 hours theoretical hours (1 theoretical hour per week)& classroom : https://classroom.google.com/c/ODA5MjY4NDgzNjI1?cjc=v4sb7xv2
16. Course administrator's name (mention all, if more than one name)
Name: Lecturer Areej Ali Hussein Al-Rasheed email : areej.ali@tu.edu.iq
17. Course Objectives
This course aims to provide the student with • Acquiring fundamental knowledge in computers and modern technologies, and developing skills in dealing with digital tools and office applications. • Developing skills in using digital tools and office applications, and understanding e-commerce and digital banking services. • Introduction to artificial intelligence, its technologies, and applications. • Developing problem-solving and troubleshooting skills, and instilling digital values and ethics. • Enhancing the ability for scientific research and using electronic sources, while promoting critical thinking and social responsibility in technology use.
18. Teaching and Learning Strategies

Strategy	• Delivering lectures with practical application of lecture topics, relying on approved sources. • Explanation and clarification using a data projector. • Discussion, asking questions, dialogue, and brainstorming. • Small group teaching and continuous follow-up with questions. • Conducting research and reports on course syllabus topics and discussing those reports, including them in the assessment. • Using e-learning methodology and blended learning.

10.Course structure

Course Level: Second year

Course Name: Advanced Computing

Evaluation methods	Learning methods	Subjects name	Learning methods outcomes	Hours	Weeks
First semester of the academic year					
Classroom performance and daily tests	Method - Scientific quality	Chapter One	Security and Networking: What is a network? Types of networks. Basic network components. Network Security Basics. Understanding network threats. Network Troubleshooting	1	1
Classroom performance and daily tests	Method - Scientific quality	Chapter One	Security and Networking: What is a network? Types of networks. Basic network components. Network Security Basics. Understanding network threats. Network Troubleshooting	1	2
Classroom performance and daily tests	Method - Scientific quality	Chapter Two	E-Commerce: Concepts of Electronic banking services this include online banking: ATM and debit card services, Phone banking, SMS banking, electronic alert, Mobile banking	1	3
Classroom performance and daily tests	Method - Scientific quality	Chapter Two	E-Commerce: Concepts of Electronic banking services this include online banking: ATM and debit card services, Phone banking, SMS banking, electronic alert, Mobile banking	1	4
Classroom performance and daily tests	Method - Scientific quality	Chapter Three	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic	1	5

			troubleshooting techniques and tools for diagnosing and resolving issues.		
Classroom performance and daily tests	Method - Scientific quality	Chapter Three	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.	1	6
Classroom performance and daily tests	Method - Scientific quality	Chapter Three	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.	1	7
Classroom performance and daily tests	Method - Scientific quality	Chapter Three	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues.	1	8
Classroom performance and daily tests	Method - Scientific quality	Chapter Four	Introduction to Al: Definition of Al, History of Al, Al techniques and Approaches, Challenges and Ethical considerations.	1	9
Classroom performance and daily tests	Method - Scientific quality	Chapter Four	Introduction to Al: Definition of Al, History of Al, Al techniques and Approaches, Challenges and Ethical considerations.	1	10
Classroom performance and daily tests	Method - Scientific quality	Chapter Four	Introduction to Al: Definition of Al, History of Al, Al techniques and Approaches, Challenges and Ethical considerations.	1	11
Classroom performance and daily tests	Method - Scientific quality	Chapter Four	Introduction to Al: Definition of Al, History of Al, Al techniques and Approaches, Challenges and Ethical considerations.	1	12
Classroom performance and daily tests	Method - Scientific quality	Chapter Five	Al in Our Daily Lives: Al in smartphones and virtual assistants like .Siri or Google Assistant	1	13
Classroom performance and daily tests	Method - Scientific quality	Chapter Five	Al in Our Daily Lives: Al in smartphones and virtual assistants like .Siri or Google Assistant	1	14
Classroom performance and daily tests	Method - Scientific quality	Chapter Five	Al in Our Daily Lives: Al in smartphones and virtual assistants like .Siri or Google Assistant		15
Classroom performance and daily tests	Method - Scientific quality	Chapter Five	Al in Our Daily Lives: Al in smartphones and virtual assistants like .Siri or Google Assistant	1	16

First semester exam					
Med term					17-18
Second semester					
Classroom performance and daily tests	Method - Scientific quality	Chapter Six	Applications of Al: Education, Healthcare, Finance, Transportation, .Marketing and Advertising	1	19
Classroom performance and daily tests	Method - Scientific quality	Chapter Six	Applications of Al: Education, Healthcare, Finance, Transportation, .Marketing and Advertising	1	20
Classroom performance and daily tests	Method - Scientific quality	Chapter Six	Applications of Al: Education, Healthcare, Finance, Transportation, .Marketing and Advertising	1	21
Classroom performance and daily tests	Method - Scientific quality	Chapter Six	Applications of Al: Education, Healthcare, Finance, Transportation, .Marketing and Advertising	1	22
Classroom performance and daily tests	Method - Scientific quality	Chapter Six	Applications of Al: Education, Healthcare, Finance, Transportation, .Marketing and Advertising	1	23
Classroom performance and daily tests	Method - Scientific quality	Chapter Six	Applications of Al: Education, Healthcare, Finance, Transportation, .Marketing and Advertising	1	24
Classroom performance and daily tests	Method - Scientific quality	Chapter Seven	AI and Society: (How Al affects social, Al and international relations, Al and the future of humanity.)	1	25
Classroom performance and daily tests	Method - Scientific quality	Chapter Seven	AI and Society: (How Al affects social, Al and international relations, Al and the future of humanity.)		26
Classroom performance and daily tests	Method - Scientific quality	Chapter Eight	Ethical Challenges in Al :(AI ethics, privacy and surveillance, the impact of Al on the job market.)	1	27
Classroom performance and daily tests	Method - Scientific quality	Chapter Eight	Ethical Challenges in Al :(AI ethics, privacy and surveillance, the impact of Al on the job market.)		28
Classroom performance and daily tests	Method - Scientific quality	Chapter Nine	The Future of Al (Future trends in Al, recent research and emerging technologies.	1	29
Classroom performance and daily tests	Method - Scientific quality	Chapter Nine	The Future of Al (Future trends in Al, recent research and emerging technologies.	3	30
Second semester exam					

3. Course Evaluation	
Score distribution out of 100, divided as follows: - 50 marks for annual follow-up, divided into 25 marks for the first semester, 25 marks for the second semester (the student seeks to obtain 50 marks annually for the monthly and daily tests for the first semester and for the second semester) The semester, which includes various elements, including the student (semester exam + Reports + Daily Assignments + Academic Assignments + Other Activities) - 50 marks for the final exam	
4. Learning and Teaching Resources	
equired textbooks (curricular books, if any)	• Al-Khader Ali Al-Khader, "Computer Basics" 2016 • Adel Abdel Nour, "Introduction to the World of Artificial Intelligence," 2005. • Subject lecture's notes.
Main references (sources)	• Graham Brown, David Watson, "Cambridge IGCSE Information and Communication • Technology", 3rd Edition (2020) • Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology In Action Complete" ,16th Edition (2020). • Ahmed Banafa, "Introduction to Artificial Intelligence (AD", 1st Edition (2024).
Recommended books and references (scientific journals, reports...)	• Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology In Action Complete" ,16th Edition (2020). • Ahmed Banafa, "Introduction to Artificial Intelligence (AD", 1st Edition (2024).
ctronic References, Websites	

Course Description Form

1. Course Name:	
Physical chemistry / 2nd year	
2. Course Code:	
3. Semester / Year:	
Annual / 2025-2026	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Class attendance + electronic classes (Google Classroom), which will be a supporting class for the in-person class, and according to the conditions and instructions of the Ministry of Higher Education and Scientific Research.	
6. Number of Credit Hours (Total) / Number of Units (Total)	
120 hours per year / 6 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Ass. Prof. Saddam Mohammed Ahmed Al-Mahmoud Email: s_almahmoud@tu.edu.iq	
8. Course objectives	
Course objectives	• Providing students with knowledge of the principles of thermodynamics as one of the basic branches of physical chemistry. • Developing students' ability by knowing the most important scientific concepts and rules that must be followed to understand the mechanisms of chemical reactions and how to control them. • Teaching students how to use and apply laws in the practical aspect. • Preparing students to practice the career of teaching chemistry in the academic institutions.
9. Teaching and Learning Strategies	
Strategy	1- Standard method (lectures). 2- Discussion and Questioning method. 3- practical method.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Sep. 4	4		General properties of gases	Standard and practical method	Class performance and exams
Oct. 1	4		Ideal gas laws	Standard and practical method	Class performance and exams
Oct. 2	4		Kinetic theory of ideal gases	Standard and practical method	Class performance and exams
Oct. 3	4		The First law of thermodynamics	Standard and practical method	Class performance and exams
Oct. 4	4		Types of thermodynamic processes	Standard and practical method	Class performance and exams
Nov. 1	4		Energy and enthalpy	Standard and practical method	Class performance and exams
Nov. 2	4		Thermochemistry	Standard and practical method	Class performance and exams
Nov. 3	4		Phase transition enthalpies	Standard and practical method	Class performance and exams
Nov. 4	4		Heat of formation	Standard and practical method	Class performance and exams
Des. 1	4		Heat of combustion	Standard and practical method	Class performance and exams
Des. 2	4		heat of neutralization	Standard and practical method	Class performance and exams
Des. 3	4		Bond energies	Standard and practical method	Class performance and exams
Des.4	4		The Second law of thermodynamics	Standard and practical method	Class performance and exams
Jan. 1	4		Entropy	Standard and practical method	Class performance and exams
Jan. 2	4		Calculate the change in entropy	Standard and practical method	Class performance and exams
Jan. 3	Spring holiday				
Jan. 4					
Feb. 1	4		The Third law of thermodynamics	Standard and practical method	Class performance and exams
Feb. 2	4		The Free energy	Standard and practical method	Class performance and exams
Feb. 3	4		Standard free energy of formation	Standard and practical method	Class performance and exams

Feb. 4	4		Chemical potential	Standard and practical method	Class performance and exams
Mar. 1	4		Chemical equilibrium	Standard and practical method	Class performance and exams
Mar. 2	4		Law of mass action	Standard and practical method	Class performance and exams
Mar.3	4		Lee-chatelier Brown rule	Standard and practical method	Class performance and exams
Mar. 4	4		The equilibrium constant changes with temperature	Standard and practical method	Class performance and exams
Apr. 1	4		Phase equilibria	Standard and practical method	Class performance and exams
Apr. 2	4		Uses of the phase rule	Standard and practical method	Class performance and exams
Apr. 3	4		Surface tension	Standard and practical method	Class performance and exams
Apr. 4	4		Adsorption	Standard and practical method	Class performance and exams
May. 1	4		Examples and solutions	Standard and practical method	Class performance and exams
May. 2	4		General Review	Standard and practical method	Class performance and exams

11. Course Evaluation

1. Formative evaluation through daily exams, observing the student's performance in class discussions and homework assignments, and classroom evaluation. This grade does not exceed 20% of the total.
2. Diagnostic evaluation by semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) semester exams during the year, that is, two exams for each semester, to extract the annual quest before entering the final exams.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	"Physical chemistry", Written by Laila Muhammad Naguib and Mahmoud Shaker Saeed., Mosul University, college of Education, 1990.
Main references (sources)	"Atkins' Physical Chemistry". Peter Atkins, Julio de Paula, James Keeler, 11^{t} Ed. 2018.
Recommended books and references (scientific journals, reports …)	Access to everything that is current and published in peer-reviewed scientific journals
Electronic References, Websites	https://scholar.google.com/ https://www.sciencedirect.com/ https://www.researchgate.net/

Course Description Form

1. Course Name: Organic Chemistry – 2end Stage
2. Course Code:
3. Semester / Year: Course for the academic year 2025-2026
4. Description Preparation Date: 18/9/2025
5. Available Attendance Forms:
Class attendance + electronic classes on the Google Classroom platform will be a supporting class for the in-person class and according to the controls and instructions of the Ministry of Higher Education and Scientific Research.
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 7 units
7. Course administrator's name (mention all, if more than one name)
Name: Eman Ayoob Yass Email: emanaywb@tu.edu.iq
8. Course Objectives

Course Objectives • Developing students' ability by identifying the most important scientific concepts and rules that must be followed by students to complete scientific research. • Urging students to obtain knowledge, information and the ability to draw conclusions. • Preparing students to practice the teaching profession and knowing how to write scientific research.	• • •

9. Teaching and Learning Strategies

Strategy	1- The standard method (giving lectures). 2- The method of discussion and interrogation. 3- Method of solving problems. 4- Brainstorming method.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
September 3	2				Class performance and exams
September 4	2			Standard method And discussion	Class performance and exams
October 1	2			Standard method And discussion	Class performance and exams
October 2	2			Standard method And discussion	Class performance and exams
October 3	2		chemical bases	Standard method And discussion	Class performance and exams
October 4	2		chemical bases	Standard method And discussion	Class performance and exams
November 1	2		alkans	Standard method And discussion	Class performance and exams
November 2	2		Alkans	Standard method And discussion	Class performance and exams
November 3	2		Alkens	Standard method And discussion	Class performance and exams
November 4	2		Preparation of alkens	Standard method And discussion	Class performance and exams
December1	2		Interactions of alkens	Standard method And discussion	Class performance and exams
December2	2		Monthly exam	Standard method And discussion	Class performance and exams
December3	2		alkyns	Standard method And discussion	Class performance and exams
December4	2		Preparation of alkyns	Standard method And discussion	Class performance and exams
January1	2		Interactions of alkyns	Standard method And discussion	Class performance and exams
January2	2		Monthly exam	Standard method And discussion	Class performance and exams
January3	2		cycloalkans	----------	----------
January4	2		Cycloalkanes	----------	---------
February 1	2		Aromatic compounds	Standard method And discussion	Class performance and exams
February 1	2		Aromatic compounds	Standard method And discussion	Class performance and exams

February 1	2		Monthly exam	Standard method And discussion	Class performance and exams
February 1	2		arens	Standard method And discussion	Class performance and exams
March 1	2		arens	Standard method And discussion	Class performance and exams
March 2	2		Spring break	Standard method And discussion	Class performance and exams
March 3	2		Alkel halides	Standard method And discussion	Class performance and exams
March 4	2		Alkel halides	Standard method And discussion	Class performance and exams
April 1	2		Monthly exam	Standard method And discussion	Class performance and exams
April 2	2		alcoholes	Standard method And discussion	Class performance and exams
April 3	2		Alcohols nomanycolure	Standard method And discussion	Class performance and exams
April 4	2		Preparation of Alcohols	Standard method And discussion	Class performance and exams
Mays1	2		Preparation of Alcohols	Standard method And discussion	Class performance and exams
Mays 2	2		Alcohols interactions	Standard method And discussion	Class performance and exams
Mays 3	2		Alcohols interactions	Standard method And discussion	Class performance and exams

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	

Course Description Form

1. Course Name:
Biochemistry / third stage
2. Course Code:
3. Semester / Year:
Yearly
4. Description Preparation Date:
18/9/2025
5. Available Attendance Forms:
Lectures in person presence with electronic classes (Classroom)
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours/2 units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Asmaa Hashim Shaker Email : dr.asmaa@tu.edu.iq

8. Course Objectives	
Course Objectives 1- Developing students' ability to follow and understand the conversation and developing their ability to distinguish between main and secondary ideas. 2- Urging students to obtain knowledge, information and the ability to draw conclusions. 3- Developing their abilities to make quick and comprehensive summaries of aspects of the topic.	

9. Teaching and Learning Strategies	
Strategy	Strategy can be defined as a set of general rules and broad lines that concern the means of achieving the desired goals of teaching and indicate the methods and plans followed by faculty members to reach the learning goals.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Oct. 1	2	Method of presentation and method of discussion	carbohydrates	The standard method, the practical method	Class performance and exams
Oct. 2	2	Method of presentation and method of discussion	carbohydrates	The standard method, the practical method	Class performance and exams
Oct. 3	2	Method of presentation and method of discussion	carbohydrates	The standard method, the practical method	Class performance and exams
Oct. 4	2	Method of presentation and method of discussion	carbohydrates	The standard method, the practical method	Class performance and exams
Nov. 1	2	Method of presentation and method of discussion	Lipids	The standard method, the practical method	Class performance and exams
Nov.2	2	Method of presentation and method of discussion	Lipids	The standard way, the practical way	Class performance and exams
Nov.3	2	Method of presentation and method of discussion	Lipids	The standard method , the practical method	Class performance and exams
Nov.4	2	Method of presentation and method of discussion	Lipids	The standard method , the practical method	Class performance and exams
Dec. 1	2	Method of presentation and method of discussion	Lipids	The standard method, the practical method	Class performance and exams
Dec. 2	2	Method of presentation and method of discussion	Amino acids	Standard method	Class performance and exams
Dec. 3	2	Method of presentation and method of discussion	Amino acids	Standard method	Class performance and exams
Dec. 4	2	Method of presentation and method of discussion	Amino acids	Standard method	Class performance and exams
Jan. 1	2	Method of presentation and method of discussion	Proteins	Standard method	Class performance and exams
Jan. 2	2	Method of presentation and method of discussion	Proteins	Standard method	Class performance and exams
Jan. 3	2	Method of presentation and method of discussion	Enzymes	Standard method	Class performance and exams
Jan. 4	2	/	Enzymes		
Feb.1	2	Method of presentation and method of discussion	Enzymes	Standard method	Class performance and exams
Feb.2	2	Method of presentation and method of discussion	Enzymes	Standard method	Class performance and exams
Mar. 1	2	Method of presentation and method of discussion	Vitamins	Standard method	Class performance and exams

Mar. 2	2	Method of presentation and method of discussion	Vitamins	Standard method	Class performance and exams
Mar. 3	2	Method of presentation and method of discussion	Nucleic acids	Standard method	Class performance and exams
Mar. 4	2	Method of presentation and method of discussion	Nucleic acids	Standard method	Class performance and exams
Apr. 1	2	Method of presentation and method of discussion	Nucleic acids	Standard method	Class performance and exams
Apr. 2	2	Method of presentation and method of discussion	Nucleic acids	Standard method	Class performance and exams
Apr. 3	2	Method of presentation and method of discussion	Hormones	Standard method	Class performance and exams
Apr. 4	2	Method of presentation and method of discussion	Hormones	Standard method	Class performance and exams
May 1	2	Method of presentation and method of discussion	Hormones	Standard method	Class performance and exams
May2	2	Method of presentation and method of discussion	Hormones	Standard method	Class performance and exams
May3	2		Hormones		
May5	2		Final exams	Problem-solving method	
May 15	2		Final exams		

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	

Main references(sources):

- Biochemistry by Qusay Chalabi

- The central library at the university, and the college library

- International Information Network (Internet)

- The prescribed curriculum for study according to the vocabulary approved by the Ministry

See help resources

Course Description Form

19. Course Name:
Research Mythology / Third Stage
20. Course Code:
21. Semester / Year:
2025-2026/ Third Year
22. Description Preparation Date:
18/9/2025
23. Available Attendance Forms:
In-class attendance + online classes on the (Google Classroom) platform serve as a supplementary cl to the in-person session, in accordance with the regulations and guidelines of the Ministry of Hig Education and Scientific Research. https://classroom.google.com/c/ODA5MjY3NjY4OTE0?cjc=rfogqlzn
24. Number of Credit Hours (Total) / Number of Units (Total)
60 hours: 30 hours theoretical hours / 2 theoretical hours per week
25. Course administrator's name (mention all, if more than one name)
Name: Lecturer Areej Ali Hussein Al-Rasheed email : areej.ali@tu.edu.iq
26. Course Objectives
This course aims to provide the student with : • Enhancing students' ability to understand the scientific principles that must be followed to conduct scientific research. • Developing students' understanding of the fundamentals of research methodology and recognizing the importance of ethics in scientific research. • Teaching students how to effectively search for and analyze information using precise methodolog for data collection and analysis. • Developing students' skills in seeking scientific knowledge and utilizing modern information sourc • Helping students understand the impact of scientific research on the environment and society. • Preparing students for a teaching career and guiding them on how to write scientific research.

27. Teaching and Learning Strategies	
Strategy	• Standard Method (Lecture Method). • Discussion and Inquiry Method. • Problem-Solving Method. • Brainstorming Method.

10.Course structure

Course level : Third year

Course Name: Research Mythology

Semester: First

Evaluation methods	Learning methods	Subjects name	Learning methods outcomes	Hours	weeks
Classroom Performance and Examinations	Standard Method Discussion	The Emergence and Development of Science		2	1
Classroom Performance and Examinations	Standard Method Discussion	Objectives of Science		2	2
Classroom Performance and Examinations	Standard Method Discussion	Scientific Research		2	3
Classroom Performance and Examinations	Standard Method Discussion	Types of Scientific Research		2	4
Classroom Performance and Examinations	Standard Method Discussion	The Problem		2	5
Classroom Performance and Examinations	Standard Method Discussion	Defining the Problem Title		2	6
Classroom Performance and Examinations	Standard Method Discussion	Preparing the Research Plan		2	7
Classroom Performance and Examinations	Standard Method Discussion	Research Methodologies and Tools		2	8
Classroom Performance and Examinations	Standard Method Discussion	Historical Method, Survey Method		2	9
Classroom Performance and Examinations	Standard Method Discussion	Descriptive Method, Statistical Method		2	10
Classroom Performance and Examinations	Standard Method Discussion	Experimental Method		2	11
Classroom Performance and Examinations	Standard Method Discussion	Other Research Methodologies		2	12
Classroom Performance and Examinations	Standard Method Discussion	Main Requirements for Conducting Research		2	13
Classroom Performance and Examinations	Standard Method Discussion	Types of Errors and Their Sources		2	14
Classroom Performance and Examinations	Standard Method Discussion	Fundamental Components of Laboratory Experiments		2	15
Classroom Performance and Examinations	Standard Method Discussion	Written Sources - Personal Exchange of Information		2	16
Half Year Vacation					
Semester: Second					
Classroom Performance and Examinations	Standard Method Discussion	Modern Scientific Research (Tools Internet Research Sites) and Artificial Intelligence		2	19
Classroom Performance and Examinations	Standard Method Discussion	Documenting Scientific Research		2	20
Classroom Performance and Examinations	Standard Method Discussion	Writing Style and Overall Format		2	21
Classroom Performance and Examinations	Standard Method Discussion	Main Sections of Research Papers			22
Classroom Performance and Examinations	Standard Method Discussion	Abstract		2	23

Classroom Performance and Examinations	Standard Method Discussion	Introduction		2	24
Classroom Performance and Examinations	Standard Method Discussion	Materials and Methods		2	25
Classroom Performance and Examinations	Standard Method Discussion	Results		2	26
Classroom Performance and Examinations	Standard Method Discussion	Discussion		2	27
Classroom Performance and Examinations	Standard Method Discussion	Illustrative Figures		2	28
Classroom Performance and Examinations	Standard Method Discussion	Final Presentation of the Research			29
Review				2	30

3.Course Evaluation
Score distribution out of 100, divided as follows: - The distribution is as follows: 50 marks for annual follow-up, divided into 25 marks for the first semester, 25 marks for the second semester (the student seeks to obtain 50 marks annually for the monthly and daily tests for the first semester and for the second semester) The semester, which includes various elements, including the student (semester exam + Reports + Daily Assignments + Academic Assignments + Other Activities) - 50 marks for the final exam

4. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	• Research Methodology" by Dr. Muthanna Abdul Razzaq Al-Amar • Subject lecture's notes.
Main references (sources)	• "Scientific Research Methodologies" by Prof. Dr. Muhammad Sarhan Ali Al-Mahmoudi (2019), Republic of Yemen – Sana'a, Dar Al-Kutub, 3rd Edition. • "Fundamentals of Scientific Research", First Edition, Egyptian Scientists Foundation.
Recommended books and references (scientific journals, reports...)	University Student Guide to Writing Scientific Research, Beni Suef University, 2020. Generative Artificial Intelligence in Education, Saudi Data and Artificial Intelligence Authority, 2023.
Electronic References, Websites	https://scholar.google.com/ , https://www.sciencedirect.com/ https://www.researchgate.net/

Course Description Form

1. Course Name:
Physical Chemistry
2. Course Code:
3rd year
3. Semester / Year:
Semester
4. Description Preparation Date:
18 /9/2025
5. Available Attendance Forms:
class and lab attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60/2 units
7. Course administrator's name (mention all, if more than one name)
Name: Ass. Ph.D Atallah burhis dahkeel Email: atallah.b@tu.edu.iq

8. Course Objectives	
Course Objectives	• To provide students with knowledge of the principles of physical chemistry as one of the fundamental branches of chemistry. • To develop students' ability by introducing them to the key scientific concepts and rules required to understand the mechanisms of chemical reactions and how to control them. • To teach students how to utilize scientific laws and apply them in practical contexts.

9. Teaching and Learning Strategies	
Strategy	• Lecture method (standard approach). • Discussion and questioning method. • Problem-solving method. • Brainstorming method.

10. Course structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1	5		Chemical Kinetics	Standard and practical method	Classroom performance and exams
October 2	5		Reaction Rate	Standard and practical method	Classroom performance and exams
October 3	5		Reaction Order, Rate Constant, and Zero-Order Reactions	Standard and practical method	Classroom performance and exams
October 4	5		First-Order Reactions; Second-Order Reactions	Standard and practical method	Classroom performance and exams
November 1	5		Third-Order Reactions; nth-Order Reactions	Standard and practical method	Classroom performance and exams
November 2	5		First exam – First Semester	Standard and practical method	Classroom performance and exams
November 3	5		Methods of Determining Reaction Order: Integration Method, Half-Life Method	Standard and practical method	Classroom performance and exams
November 4	5		Differential Method; Isolation Method	Standard and practical method	Classroom performance and exams
December 1	5		Complex Reactions: Parallel and Consecutive Reactions	Standard and practical method	Classroom performance and exams
December 2	5		Reversible Reactions; Chain Reactions	Standard and practical method	Classroom performance and exams
December 3	5		Theories of Chemical Reaction Kinetics	Standard and practical method	Classroom performance and exams
December 4	5		Effect of Temperature on Reaction Rate; Arrhenius Equation	Standard and practical method	Classroom performance and examinations
January 1	5		Ionic Strength; Effect of Salt and Solvent on Reaction Rate	Standard and practical method	Classroom performance and exams

January 2	5		Second Midterm – Second Semester	Standard and practical method	Classroom performance and exams
January 3	5		Spring holiday	–	–
January 4	5		Spring holiday	–	–
February 1	5		Introduction to Electrochemistry	Standard and practical method	Classroom performance and exams
February 2	5		Faraday's Law	Standard and practical method	Classroom performance and exams
March 1	5		Electrolytic Conductance	Standard and practical method	Classroom performance and exams
March 2	5		Effect of Molar Conductivity with Dilution	Standard and practical method	Classroom performance and exams
March 3	5		Relationship between Molar Conductance and Concentration	Standard and practical method	Classroom performance and exams
March 4	5		Ionic Mobility; Transport Number	Standard and practical method	Classroom performance and exams
April 1	5		Exams	Standard and practical method	Classroom performance and exams
April 2	5		Electrodes	Standard and practical method	Classroom performance and exams
April 3	5		Standard Electrodes and Electrode Potential	Standard and practical method	Classroom performance and exams
April 4	5		Electrochemical Cells; Types of Electrochemical Cells	Standard and practical method	Classroom performance and exams
May 1	5		Methods of Determining Cell Potential	Standard and practical method	Classroom performance and exams
May 2	5		Nernst Equation	Standard and practical method	Classroom performance and exams
May 3	5		Applications of Electromotive Force	Standard and practical method	Classroom performance and exams
May 4	5		Exams	Standard and practical method	Classroom performance and exams

11. Course evaluation	
1. 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 2. **Formative assessment** is conducted through observing the student's performance in classroom discussions, homework assignments, and examinations. The coursework grade constitutes **15%**, with an additional **35%** allocated to class activities, making a total of **50%** for continuous assessment. 3. **Summative assessment** is carried out through the final practical and theoretical examinations in order to determine pass or fail status. This component constitutes **50%** of the total grade.	
12. Learning and teaching resources	
Required textbooks (methodology, if any)	- *Physical Chemistry – Kinetics*, Dr. Mahmoud Shaker Saeed, University of Mosul, 1990. - *Electrochemistry*, Jalal Mohammed Saleh.
Main references (sources)	- *Atkins' Physical Chemistry*, Peter Atkins, Julio de Paula, James Keeler, 11th Edition, 2018.
Recommended supporting books and references (scientific journals, reports….)	View all the latest information published in peer-reviewed scientific journals
Electronic references, internet sites	- Google Scholar - ScienceDirect - ResearchGate

Course Description Form

1. Course Name:
Physical Chemistry
2. Course Code:
3rd year
3. Semester / Year:
Yearly / 2025-2026
4. Description Preparation Date:
18 /9/2025
5. Available Attendance Forms:
class and lab attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
60/2 units
7. Course administrator's name (mention all, if more than one name)
Name: Lecturer Asya Akabr Tawfiq Email: asya.akbar@tu.edu.iq

8. Course Objectives	
Course Objectives	• To provide students with knowledge of the principles of physical chemistry as one of the fundamental branches of chemistry. • To develop students' ability by introducing them to the key scientific concepts and rules required to understand the mechanisms of chemical reactions and how to control them. • To teach students how to utilize scientific laws and apply them in practical contexts.

9. Teaching and Learning Strategies	
Strategy	• Lecture method (standard approach). • Discussion and questioning method. • Problem-solving method. • Brainstorming method.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1	5		Chemical Kinetics	Standard and practical method	Classroom performance and exams
October 2	5		Reaction Rate	Standard and practical method	Classroom performance and exams
October 3	5		Reaction Order, Rate Constant, and Zero-Order Reactions	Standard and practical method	Classroom performance and exams
October 4	5		First-Order Reactions; Second-Order Reactions	Standard and practical method	Classroom performance and exams
November 1	5		Third-Order Reactions; nth-Order Reactions	Standard and practical method	Classroom performance and exams
November 2	5		First exam – First Semester	Standard and practical method	Classroom performance and exams
November 3	5		Methods of Determining Reaction Order: Integration Method, Half-Life Method	Standard and practical method	Classroom performance and exams
November 4	5		Differential Method; Isolation Method	Standard and practical method	Classroom performance and exams
December 1	5		Complex Reactions: Parallel and Consecutive Reactions	Standard and practical method	Classroom performance and exams
December 2	5		Reversible Reactions; Chain Reactions	Standard and practical method	Classroom performance and exams
December 3	5		Theories of Chemical Reaction Kinetics	Standard and practical method	Classroom performance and exams
December 4	5		Effect of Temperature on Reaction Rate; Arrhenius Equation	Standard and practical method	Classroom performance and examinations
January 1	5		Ionic Strength; Effect of Salt and Solvent on Reaction Rate	Standard and practical method	Classroom performance and exams

January 2	5		Second Midterm – Second Semester	Standard and practical method	Classroom performance and exams
January 3	5		Spring holiday	–	–
January 4	5		Spring holiday	–	–
February 1	5		Introduction to Electrochemistry	Standard and practical method	Classroom performance and exams
February 2	5		Faraday's Law	Standard and practical method	Classroom performance and exams
March 1	5		Electrolytic Conductance	Standard and practical method	Classroom performance and exams
March 2	5		Effect of Molar Conductivity with Dilution	Standard and practical method	Classroom performance and exams
March 3	5		Relationship between Molar Conductance and Concentration	Standard and practical method	Classroom performance and exams
March 4	5		Ionic Mobility; Transport Number	Standard and practical method	Classroom performance and exams
April 1	5		Exams	Standard and practical method	Classroom performance and exams
April 2	5		Electrodes	Standard and practical method	Classroom performance and exams
April 3	5		Standard Electrodes and Electrode Potential	Standard and practical method	Classroom performance and exams
April 4	5		Electrochemical Cells; Types of Electrochemical Cells	Standard and practical method	Classroom performance and exams
May 1	5		Methods of Determining Cell Potential	Standard and practical method	Classroom performance and exams
May 2	5		Nernst Equation	Standard and practical method	Classroom performance and exams

May 3	5		Applications of Electromotive Force	Standard and practical method	Classroom performance and exams
May 4	5		Exams	Standard and practical method	Classroom performance and exams

11. Course evaluation	
4. 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 5. Formative assessment is conducted through observing the student's performance in classroom discussions, homework assignments, and examinations. The coursework grade constitutes 15%, with an additional 35% allocated to class activities, making a total of 50% for continuous assessment. 6. Summative assessment is carried out through the final practical and theoretical examinations in order to determine pass or fail status. This component constitutes 50% of the total grade.	
12. Learning and teaching resources	
Required textbooks (methodology, if any)	*Physical Chemistry – Kinetics*, Dr. Mahmoud Shaker Saeed, University of Mosul, 1990. - *Electrochemistry*, Jalal Mohammed Saleh.
Main references (sources)	*Atkins' Physical Chemistry*, Peter Atkins, Julio de Paula, James Keeler, 11th Edition, 2018.
Recommended supporting books and references (scientific journals, reports….)	View all the latest information published in peer-reviewed scientific journals
Electronic references, internet sites	https://scholar.google.com https://www.sciencedirect.com/ https://www.researchgate.net/

Course Description Form

1. Course Name	
Optional /Nano/ Third Stage	
2. Course Code	
3. Semester/Year	
annual	
4. Date of preparation of this description	
18/9/2025	
5. Available Attendance Forms	
Lectures in person and electronic classes (Classroom)	
6. Number of credit hours (total) / number of units (total)	
60 hours / 2 units	
7. Course administrator's name (if more than one name is mentioned)	
Name: Dr. Ban Dawood Saleh Email:baan.saleh@tu.edu.iq	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand the conversation and developing their ability to distinguish between the main and secondary ideas. 2- Urging students to obtain knowledge, information and the ability to draw conclusions. 3- Develop their abilities to make quick and comprehensive summaries of the aspects of the topic.
9. Teaching and learning strategies	
Strategy can be defined as a set of general rules and outlines that are concerned with the means of achieving the desired goals of teaching and refer to the methods and plans followed by faculty members to reach the learning goals.	

10. Course Structure					
The week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1	2	Diction method Discussion method	Nanochemistry	Standard method, practical method	Classroom performance and exams
October 2	2	Diction method Discussion method	Nanomaterials	Standard method, practical method	Classroom performance and exams
October 3	2	Diction method Discussion method	Nanotechnology	Standard method, practical method	Classroom performance and exams
October 4	2	Diction method Discussion method	Traditional non-nanomaterials	Standard method, practical method	Classroom performance and exams
November 1	2	Diction method Discussion method	Nanomaterials or advanced materials	Standard method, practical method	Classroom performance and exams
November 2	2	Diction method Discussion method	Classification of nanomaterials and their applications	Standard method, practical method	Classroom performance and exams
November 3	2	Diction method Discussion method	Change in the properties of nanomaterials	Standard method -Practical method	Classroom performance and exams
November 4	2	Diction method Discussion method	Optical properties	Standard method -Practical method	Classroom performance and exams
December 1	2	Diction method Discussion method	Nano-optical catalysts	Standard method, practical method	Classroom performance and exams
December 2	2	Diction method Discussion method	The phenomenon of photocatalysis	Standard method	Classroom performance and exams
December3	2	Diction method Discussion method	Methods of preparation of nanomaterials	Standard method	Classroom performance and exams
December 4	2	Diction method Discussion method	Grinding method	Standard method	Classroom performance and exams
January 1	2	Diction method Discussion method	Laser ablation method	Standard method	Classroom performance and exams
January 2	2	Diction method Discussion method	Fullorin	Standard method	Classroom performance and exams

January 3	2	Diction method Discussion method	Nanoparticles	Standard method	Classroom performance and exams
January 4	2	/	First Semester Exam		
February 1	2	Diction method Discussion method	Nanotubes	Standard method	Classroom performance and exams
February 2	2	Diction method Discussion method	Nanowires	Standard method	Classroom performance and exams
March 1	2	Diction method Discussion method	Nanocomposites	Standard method	Classroom performance and exams
March 2	2	Diction method Discussion method	Nanotechnology Applications	Standard method	Classroom performance and exams
March 3	2	Diction method Discussion method	Metals and metal alloys	Standard method	Classroom performance and exams
March 4	2	Diction method Discussion method	Polymers	Standard method	Classroom performance and exams
April 1	2	Diction method Discussion method	Composite materials	Standard method	Classroom performance and exams
April 2	2	Diction method Discussion method	Mechanical properties	Standard method	Classroom performance and exams
April 3	2	Diction method Discussion method	One-dimensional nanomaterials	Standard method	Classroom performance and exams
April 4	2	Diction method Discussion method	Two-dimensional nanomaterials	Standard method	Classroom performance and exams
May 1	2	Diction method Discussion method	Three-dimensional nanomaterials	Standard method	Classroom performance and exams
May 2	2	Diction method Discussion method	Electron microscopes	Standard method	Classroom performance and exams
May 3	2		Second Semester Exam		
May 5	2		General Review	Problem solving method	
May 15			Final Exams		

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily attendance, daily and monthly exams, reports... etc	
12. Learning and Teaching Resources	
Required textbooks (methodology, if any)	Nanochemistry / Department of Chemistry
Key references (sources)	- Adeniyi Osikoya , Wankasi Donbebe , Rrmt Vala , Ayo samuel Afolabi , Synthesis , Characterization and adsorption studies of fluorine . Helmuth Kaiser Consultancy . Nanotechnology in food and food processing Industry Worldwide , 2004
Recommended supporting books and references (scientific journals, reports...)	
Electronic references, websites	

Course Description Form

1. Course Name:	
Coordination Chemistry / Third Stage	
2. Course Code	
3. Semester / Year	
Annual 2026 / 2025	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Dina Saadi Mohamed Sabhi Email: deena3@tu.edu.iq	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. 2- Encouraging students to acquire knowledge and information and the ability to draw conclusions. 3- Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure					
Week	Hours	Required learning outcomes	Unit or topic name	Learning method	Evaluation method
October 1	2	Presentation method Discussion method	Periodic table of elements and classification of elements	Standard method, practical method	Grades and exams
October 2	2	Presentation method Discussion method	Transitional elements	Standard method, practical method	Grades and exams
October 3	2	Presentation method Discussion method	Characteristics of transitional elements and their types	Standard method, practical method	Grades and exams
October 4	2	Presentation method Discussion method	Theories explaining the coordination complexes	Standard method, practical method	Grades and exams
November1	2	Presentation method Discussion method	Double electron pair	Standard method, practical method	Grades and exams
November2	2	Presentation method Discussion method	Coordination numbers and their geometric shapes	Standard method, practical method	Grades and exams
November3	2	Presentation method Discussion method	Types of complexes based on their charge	Standard method, practical method	Grades and exams
November4	2	Presentation method Discussion method	Ligands and their types	Standard method, practical method	Grades and exams
December1	2	Presentation method Discussion method	Modern nomenclature of complexes	Standard method, practical method	Grades and exams
December 2	2	Presentation method Discussion method	Effective atomic number rule (18 electrons)	Standard method, practical method	Grades and exams
December 3	2	Presentation method Discussion method	Theories explaining the nature of coordination bonds	Standard method, practical method	Grades and exams
December 4	2	Presentation method Discussion method	Valence Bond Theory (V.B.T)	Standard method, practical method	Grades and exams

January 1	2	Presentation method Discussion method	Crystal Field Theory (C.F.T)	Standard method, practical method Standard method, practical method	Grades and exams
January 2	2	Presentation method Discussion method	Splitting in octahedral complexes	Standard method, practical method	Grades and exams
January 3	2	Presentation method Discussion method	Splitting in tetrahedral complexes	Standard method, practical method	Grades and exams
January 4			First Semester Exams		
February 1	2	Presentation method Discussion method	Distorted octahedral complex	Standard method, practical method	Grades and exams
February 2	2	Presentation method Discussion method	Distorted tetrahedral complex	Standard method, practical method	Grades and exams
March 1	2	Presentation method Discussion method	Splitting in square planar complexes	Standard method, practical method	Grades and exams
March 2	2	Presentation method Discussion method	Molecular Orbital Theory (M.O.T)	Standard method, practical method	Grades and exams
March 3	2	Presentation method Discussion method	Molecular orbitals	Standard method, practical method	Grades and exams
March 4	2	Presentation method Discussion method	The characteristic of strain according to the theory of molecular orbitals	Standard method, practical method	Grades and exams
April 1	2	Presentation method Discussion method	Orbital symmetry	Standard method, practical method	Grades and exams
April 2	2	Presentation method Discussion method	Molecular orbital diagram for octahedral complexes	Standard method, practical method	Grades and exams

April 3	2	Presentation method Discussion method	Molecular orbital diagram for square planar complexes	Standard method, practical method	Grades and exams Grades and exams
April 4	2	Presentation method Discussion method	Geometric isomers	Standard method, practical method	Grades and exams
May 1	2	Presentation method Discussion method	Factors affecting the stability of complexes	Standard method, practical method	Grades and exams
May 2	2	Presentation method Discussion method	Mechanics of substitution reactions and oxidation-reduction reactions	Standard method, practical method	Grades and exams
May 3			Second semester exam		
May 4			General review	Problem-solving method	
May 15			Final exams		

11. Course Evaluation	
Distribution of grades out of 100 according to tasks assigned to the student such as daily attendance, daily and monthly exams, reports, etc.	
12. Learning and Teaching Resources	
Required textbooks (methodology if available)	Chemistry of Transition Elements / Chemistry Department
Main references (sources)	1- Chemistry of Transition Elements - Coordination Principles (Dr. Naaman Al Nuaimi) 2- Coordination Chemistry (Translated by Dalal Ajam and Dr. Ali Hassoun Al Tayyar) 3- Chemistry of Transition Elements (Dr. Mahdi Naji Al Zakum)
Recommended supplementary books and references (scientific journals, reports...)	
Electronic references, internet sites	

Course Description Form

1. Course Name:
Organic Chemistry - Third Stage
2. Course Code:
3. Semester / Year
Annual 2025-2026
4. Description Preparation Date:
18/9/2025
5. Available Attendance Forms:
Class attendance + electronic classes on the Google Classroom platform will be a supporting class for the in-person class and according to the controls and instructions of the Ministry of Higher Education and Scientific Research.
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 7 units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Fawzi Hameed Jumaa Email: Fawzi.99883@tu.edu.iq
8. Course Objectives

Course Objectives • Providing students with knowledge of the principles of thermodynamics as one of the basic branches of physical chemistry. • Developing students' ability by knowing the most important scientific concepts and rules that must be followed to understand the mechanisms of chemical reactions and how to control them. • Teaching students how to use and apply laws in the practical aspect. • Preparing students to practice the career of teaching chemistry in the academic institutions.	• ..... • •

9. Teaching and Learning Strategies	
Strategy	1- The standard method (giving lectures). 2- The method of discussion and interrogation. 3- Method of solving problems. 4- Brainstorming method.

10. Course Structure					
The week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
September 3	2		Stereochemistry	Standard method And discussion	Class performance and exams
September 4	2		Stereospecific reactions	Standard method And discussion	Class performance and exams
October 1	2		The forces of acids and bases	Standard method And discussion	Class performance and exams
October 2	2		Aromatic carboxylic acids	Standard method And discussion	Class performance and exams
October 3	2		Aromatic bases	Standard method And discussion	Class performance and exams
October 4	2		Cationic carbon ion - its preparation and reactions	Standard method And discussion	Class performance and exams
November 1	2		Monthly exam	Standard method And discussion	Class performance and exams
November 2	2		Migration to electron deficient nitrogen	Standard method And discussion	Class performance and exams
November 3	2		Negative carbon ion - methods of preparing it	Standard method And discussion	Class performance and exams
November 4	2		Negative carbon ion and tautomerism	Standard method And discussion	Class performance and exams
December1	2		Negative carbon ion reactions	Standard method And discussion	Class performance and exams
December2	2		Negative carbon ion stability	Standard method And discussion	Class performance and exams
December3	2		Nucleophilic substitution on a saturated carbon atom	Standard method And discussion	Class performance and exams
December4	2		Mechanical and chemoelectric concepts	Standard method And discussion	Class performance and exams
January1	2		structure effect, Solvent, input group	Standard method And discussion	Class performance and exams
January2	2		Monthly exam	Standard method And discussion	Class performance and exams
January3	2		Spring break	———	———

January4	2		Spring break	———	———
February 1	2		elemention reactions Mechanical E1,E2,E1CB	Standard method And discussion	Class performance and exams
February 1	2		Effect of the activating group on the mechanics of elemention	Standard method And discussion	Class performance and exams
February 1	2		Free radicals	Standard method And discussion	Class performance and exams
February 1	2		Free radical reactions	Standard method And discussion	Class performance and exams
March 1	2		Polynulecular aromatic compounds	Standard method And discussion	Class performance and exams
March 2	2		Naphthalene and substitution reactions	Standard method And discussion	Class performance and exams
March 3	2		Anthracene and phenanthrene	Standard method And discussion	Class performance and exams
March 4	2		Heterocyclic compounds	Standard method And discussion	Class performance and exams
April 1	2		Electrophilic substitution of heterocyclic compounds	Standard method And discussion	Class performance and exams
April 2	2		Monthly exam	Standard method And discussion	Class performance and exams
April 3	2		Pyridine - its preparation and reactions	Standard method And discussion	Class performance and exams
April 4	2		Stability of the pyridine ring	Standard method And discussion	Class performance and exams
May 1	2		Quinoline preparation methods	Standard method And discussion	Class performance and exams
May 2	2		Stability of the quinoline ring	Standard method And discussion	Class performance and exams
May 3	2		substitution reaction of quinoline	Standard method And discussion	Class performance and exams

11. Course Evaluation	
3- Formative evaluation through daily exams, observing the student's performance in class discussions and homework assignments, and classroom evaluation. This grade does not exceed 20% of the total. 4- Diagnostic evaluation by semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) semester exams during the year, that is, two exams for each semester, to extract the annual quest before entering the final exams.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	1-Organic Chemistry ,R. T. Morrison and R.N. Boyd, 6thEdition, Prentice – Hall. Englewood Cliffs, New Jersey 07632 (1992).
Main references (sources)	2-Advanced Organic Chemistry , Fawzi Hameed Jumaa, 1st Edu. Althakera for publishing and distribution (2022). 3-Guide to the mechanics of organic reactions, Peter Sykes - translated by Dr. Fadel Suleiman Kammouna and Dr. Adeed Yusuf Miri, Deposit No. 321 in the National Library in Baghdad for the year 1984, Basra University Press (1984).
Recommended books and references (scientific journals, reports …)	Access to everything that is current and published in peer-reviewed scientific journals
Electronic References, Websites	https://scholar.google.com/ https://www.sciencedirect.com/ https://www.researchgate.net/

Course description form

1. Course name					
College of Education for Girls - Department of Chemistry					
2. Course code					
Teaching methods					
3. Semester/year					
Annual					
4. The date this description was prepared					
18/9/2025					
5. Available forms of attendance					
Theoretical					
6. Number of study hours (total) / number of units (total)					
90					
7. Name of the course administrator (if more than one name is mentioned)					
Name: M. Intisar Modheher Khairo Email: intisar.modheher@tu.edu.iq					
8. Course objectives					
• Providing students with theoretical information on how to deliver the lesson. • Teaching female students basic sciences. • Providing students with practical and theoretical scientific information.			Objectives of the study subject		
9. Teaching and learning strategies					
			Active learning strategies		
10. Course structure					
Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Daily exams with multiple choice questions	Discussion method	Introduction to teaching methods	The nature of teaching The concept of teaching method Advantages of a good teaching method Reasons for multiple teaching methods	3	The first week
Oral and written exam	Elocution	Educational goals	Sources for deriving educational objectives Types of educational objectives General goals Importance Behavioral goals	3	second week

			Domains		
Oral and written exam	Interrogation method	Teaching planning	Reasons for planning Some objections to planning Basic principles of planning Types of teaching plans	3	the third week
Oral and written exam	How to deliver information to students	Teaching methods	elocution Interrogation method Discussion method	3	fourth week
Oral and written exam	How to deliver information to students	Teaching methods	Extrapolation method Conclusion method Method of solving problems Programmed teaching method Project method Exploration method Concept mapping method	3	The fifth week
Written exam	How does the student deal with the event?	Current events	Selection criteria Methods of using it	3	the sixth week
Written exam	How does the student deal with the event?	Current events	The role of students in selecting and using it	3	The seventh week

11. Course evaluation	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc.	
12. Learning and teaching resources	
Teaching methods subject/chemistry department	Required textbooks (methodology, if any)
Hassan Al-Sayyid Shehata, Egyptian Lebanese Publishing House, first edition, Cairo 2008	Main references (sources)
Effat Mustafa Al-Sanawi - Methods of learning, teaching and learning and their applications in educational research, Anglo-Egyptian Journal, 1st edition, Cairo 2002	Recommended supporting books and references (scientific journals, reports...)
	Electronic references, Internet sites

Course Description Form

1. Course Name:	
Biochemistry Laboratory / Third Stage	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Aya Jasim Mohammed Email: aya.mohammed@tu.edu.iq	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. 2- Encouraging students to acquire knowledge and information and the ability to draw conclusions. 3- Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure					
Week	Hours	Required learning outcomes	Unit or topic name	Learning method	Evaluation method
October 1	3	Presentation method Discussion method	Carbohydrate , Molisch's test	Standard method, practical method	Grades and exams
October 2	3	Presentation method Discussion method	Benedict test	Standard method, practical method	Grades and exams
October 3	3	Presentation method Discussion method	Barfoed test	Standard method, practical method	Grades and exams
October 4	3	Presentation method Discussion method	Seliwanoff's test	Standard method, practical method	Grades and exams
November1	3	Presentation method Discussion method	Bial's test	Standard method, practical method	Grades and exams
November2	3	Presentation method Discussion method	Osazone Crystal test	Standard method, practical method	Grades and exams
November3	3	Presentation method Discussion method	Fehling test	Standard method, practical method	Grades and exams
November4	3	Presentation method Discussion method	Hydrolysis of disaccharides by acid, their detection, and comparison with monosaccharides.	Standard method, practical method	Grades and exams
December1	3	Presentation method Discussion method	Detection of polysaccharides , Acid hydrolysis of starch	Standard method, practical method	Grades and exams
December 2	3	Presentation method Discussion method	Identification of an unknown carbohydrate	Standard method, practical method	Grades and exams
December 3	3	Presentation method Discussion method	Lipids , Solubility of lipids	Standard method, practical method	Grades and exams

December 4	3	Presentation method Discussion method	Saponification value of fat	Standard method, practical method	Grades and exams
January 1	3	Presentation method Discussion method	Detection of saturated and unsaturated fatty acids	Standard method, practical method Standard method, practical method	Grades and exams
January 2	3	Presentation method Discussion method	Acrolein test	Standard method, practical method	Grades and exams
January 3	3	Presentation method Discussion method	Estimation of blood cholesterol	Standard method, practical method	Grades and exams
January 4	3	Presentation method Discussion method	First semester exam	Standard method, practical method	Grades and exams
February 1	3	Presentation method Discussion method	Proteins , Biuret test	Standard method, practical method	Grades and exams
February 2	3	Presentation method Discussion method	Ninhydrin test , Millons test	Standard method, practical method	Grades and exams
March 1	3	Presentation method Discussion method	Sakaguchi test , Xanthoproteic test	Standard method, practical method	Grades and exams
March 2	3	Presentation method Discussion method	Hopkin's – Cole test , Alkali labile sulfer test	Standard method, practical method	Grades and exams
March 3	3	Presentation method Discussion method	Precipitation by heavy metals , precipitation by acidic reagents	Standard method, practical method	Grades and exams
March 4	3	Presentation method Discussion method	Precipitation of proteins at their isoelectric point, precipitation by salting out	Standard method, practical method	Grades and exams
April 1	3	Presentation method Discussion method	Vitamins, determination of vitamin C in foods, determination of vitamin A in some food materials	Standard method, practical method	Grades and exams
April 2	3	Presentation method	Enzymes, detection of enzyme activity	Standard method, practical method	Grades and exams

		Discussion method			
April 3	3	Presentation method Discussion method	Detection of catalase enzyme activity	Standard method, practical method	Grades and exams Grades and exams
April 4	3	Presentation method Discussion method	Effect of temperature on the enzymatic reaction	Standard method, practical method	Grades and exams
May 1	3	Presentation method Discussion method	Effect of pH on the enzymatic reaction	Standard method, practical method	Grades and exams
May 2	3	Presentation method Discussion method	Detection of the chemical nature of the substance that makes up the enzyme	Standard method, practical method	Grades and exams
May 3			Second semester exam		
May 4			General review	Problem-solving method	
May 15			Final exams		

11. Course Evaluation	
Distribution of grades out of 100 according to tasks assigned to the student such as daily attendance, daily and monthly exams, reports, etc.	
12. Learning and Teaching Resources	
Required textbooks (methodology if available)	Biochemistry (Dr. Qusay Abdulqader Al-Jalabi)
Main references (sources)	Introduction to Biochemistry (Dr. Khawla Ahmed Al-Falih)
Recommended supplementary books and references (scientific journals, reports...)	Biochemistry (Dr. Talal Saeed Al-Najafi)
Electronic references, internet sites	

Course Description Form

1. Course Name:	
Quantum and Spectra/ 4th year	
2. Course Code:	
3. Semester / Year:	
Annual / 2025-2026	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Class attendance + electronic classes	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours per year / 2 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Asya Akbar Tawfiq Email: asya.akbar@tu.edu.iq	
8. Course objectives	
Course Objectives	To enable students to gain a comprehensive understanding of the fundamental principles of quantum chemistry and spectroscopy, as they represent essential branches of physical chemistry. To enhance students' awareness of the scope and significance of chemistry as a scientific discipline, equipping them with both theoretical and practical skills, and preparing them to teach chemistry effectively in academic institutions. To develop students' competencies by familiarizing them with the key scientific concepts and principles necessary to comprehend the relationship between chemical reactions from both theoretical and experimental perspectives.
9. Teaching and Learning Strategies	
Strategy	1. Standard method (lectures). 2. Discussion and Questioning method. 3. Solving problems method. 4. Brainstorming method.

10. Course Structure					
The week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Oct. 1	2		Fundamentals of Quantum Mechanics	Standard Method & Discussion	Class Performance & Exams
Oct. 2	2		Failures of Classical Physics	Standard Method & Discussion	Class Performance & Exams
Oct. 3	2		Blackbody Radiation Heat Capacities	Standard Method & Discussion	Class Performance & Exams
Oct. 4	2		Photoelectric Effect Atomic and Molecular Spectra	Standard Method & Discussion	Class Performance & Exams
Nov. 1	2		Evolution of the Atomic Concept	Standard Method & Discussion	Class Performance & Exams
Nov. 2	2		Schrödinger Equation	Standard Method & Discussion	Class Performance & Exams
Nov. 3	2		Born Interpretation of the Wave Function	Standard Method & Discussion	Class Performance & Exams
Nov. 4	2		Principles of Quantum Mechanics	Standard Method & Discussion	Class Performance & Exams
Dec. 1	2		Uncertainty Principle	Standard Method & Discussion	Class Performance & Exams
Dec. 2	2		Applications of Quantum Mechanics	Standard Method & Discussion	Class Performance & Exams
Dec. 3	2		Translational Motion	Standard Method & Discussion	Class Performance & Exams
Dec. 4	2		Rotational Motion	Standard Method & Discussion	Class Performance & Exams
Jan. 1	2		Vibrational Motion	Standard Method & Discussion	Class Performance & Exams
	-	Examination	Exam -	Exam	
Jan.3	Spring holiday				
Jan.4	Spring holiday				
	Feb.1		Introduction to spectrum	Examination Standard and discussion method	Class performance and exams Exam

Feb.2	2		Electromagnetic spectrum	Standard and discussion method	Class performance and exams
Feb.3	2		Microwave Spectroscopy	Standard and discussion method	Class performance and exams
Feb.4	2		Infrared spectroscopy	Standard and discussion method	Class performance and exams
Mar.1	Student trainees at schools				
Mar.2	Student trainees at schools				
Mar.3	Student trainees at schools				
Mar.4	Student trainees at schools				
Apr.1	Student trainees at schools				
Apr.2	Student application in schools				
Apr.3	2		Raman spectroscopy	Standard and discussion method	Class performance and exams
Apr.4	2		Electronic Spectra	Standard and discussion method	Class performance and exams
May1	2		Nuclear magnetic resonance	Standard and discussion method	Class performance and exams
May2	Exame				
May3	Final exams				
May4					

11. Course evaluation	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc	
12. Learning and teaching resources	
Required textbooks (methodology, if any)	Muthanna Abdul-Jabbar Shanshal, Introduction to Quantum Mechanics. Laila Muhammad Najib, The Spectrum, University of Mosul, 1985
Main references (sources)	Thomas Engel, Quantum Chemistry & Spectroscopy, 2013, 3rd ed. Pearson Education, Inc. Glenview, USA, p 113-120. Peter Atkins, Julio de Paula, ATKINS PHYSICAL CHEMISTRY, 8th Ed., W. H. Freeman and Company, N. Y., 2006, p 290-295.
Recommended supporting books and references (scientific journals, reports….)	View all the latest information published in peer-reviewed scientific journals
Electronic references, internet sites	https://scholar.google.com https://www.sciencedirect.com/ https://www.researchgate.net/

Course Description Form

1. Course Name	
Optional /Heterogeneous Loops / Fourth Stage	
2. Course Code	
3. Semester/Year	
annual	
4. Date of preparation of this description	
18/9/2025	
5. Available Attendance Forms	
Lectures in person and electronic classes (Classroom)	
6. Number of credit hours (total) / number of units (total)	
60 hours / 2 units	
7. Course administrator's name (if more than one name is mentioned)	
Name: Dr. Ban Dawood Saleh Email:baan.saleh@tu.edu.iq	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand the conversation and developing their ability to distinguish between the main and secondary ideas. 2- Urging students to obtain knowledge, information and the ability to draw conclusions. 3- Develop their abilities to make quick and comprehensive summaries of the aspects of the topic.
9. Teaching and learning strategies	
Strategy can be defined as a set of general rules and outlines that are concerned with the means of achieving the desired goals of teaching and refer to the methods and plans followed by faculty members to reach the learning goals.	

10. Course Structure					
The week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1	2	Diction method Discussion method	Introduction to heterocyclic compounds	Standard method, practical method	Classroom performance and exams
October 2	2	Diction method Discussion method	Triple heterocyclic compounds	Standard method, practical method	Classroom performance and exams
October 3	2	Diction method Discussion method	naming tertiary heterocyclic compounds,	Standard method, practical method	Classroom performance and exams
October 4	2	Diction method Discussion method	Laboratory methods for the preparation of tertiary heterocyclic compounds	Standard method, practical method	Classroom performance and exams
November 1	2	Diction method Discussion method	Practical methods for the preparation of tertiary noncyclic compounds	Standard method, practical method	Classroom performance and exams
November 2	2	Diction method Discussion method	naming quaternary heterocyclic compounds,	Standard method, practical method	Classroom performance and exams
November 3	2	Diction method Discussion method	Laboratory methods for the preparation of tetraheteric cyclic compounds	Standard method -Practical method	Classroom performance and exams
November 4	2	Diction method Discussion method	Practical methods for the preparation of tetracyclic heterocyclic compounds	Standard method -Practical method	Classroom performance and exams
December 1	2	Diction method Discussion method	Penta-heterocyclic compounds	Standard method, practical method	Classroom performance and exams
December 2	2	Diction method Discussion method	naming penta-heterocyclic compounds,	Standard method	Classroom performance and exams
December3	2	Diction method Discussion method	Laboratory methods for the preparation of penta-heterocyclic compounds	Standard method	Classroom performance and exams

December 4	2	Diction method Discussion method	Practical methods of preparation of penta-heterocyclic compounds	Standard method	Classroom performance and exams
January 1	2	Diction method Discussion method	Heterocyclic hexagonal compounds	Standard method	Classroom performance and exams
January 2	2	Diction method Discussion method	naming heterocyclic hexagonal compounds,	Standard method	Classroom performance and exams
January 3	2	Diction method Discussion method	Laboratory methods for the preparation of heterocyclic hexagonal compounds	Standard method	Classroom performance and exams
January 4	2	/	First Semester Exam		
February 1	2	Diction method Discussion method	Practical methods for the preparation of heterocyclic hexagonal compounds	Standard method	Classroom performance and exams
February 2	2	Diction method Discussion method	Preidine and derivatives and its preparation	Standard method	Classroom performance and exams
March 1	2	Diction method Discussion method	Hexagonal rings containing an oxygen atom	Standard method	Classroom performance and exams
March 2	2	Diction method Discussion method	Hexagonal rings containing a nitrogen atom	Standard method	Classroom performance and exams
March 3	2	Diction method Discussion method	AA heterocyclic polycyclic cyclic compounds	Standard method	Classroom performance and exams
March 4	2	Diction method Discussion method	Furans and its preparation	Standard method	Classroom performance and exams
April 1	2	Diction method Discussion method	Theofen and its preparation	Standard method	Classroom performance and exams
April 2	2	Diction method Discussion method	Pyrol and its preparation	Standard method	Classroom performance and exams
April 3	2	Diction method Discussion method	Perazole and its preparation	Standard method	Classroom performance and exams

April 4	2	Diction method Discussion method	Amidazole and its preparation	Standard method	Classroom performance and exams
May 1	2	Diction method Discussion method	Oxazole and its preparation	Standard method	Classroom performance and exams
May 2	2	Diction method Discussion method	Thiazole and its preparation	Standard method	Classroom performance and exams
May 3	2		Second Semester Exam		
May 5	2		General Review	Problem solving method	
May 15			Final Exams		

11. Course Evaluation	
Distributing the score out of 100 according to the tasks assigned to the student such as daily attendance, daily and monthly exams, reports... etc	
12. Learning and Teaching Resources	
Required textbooks (methodology, if any)	Nanochemistry / Department of Chemistry
Key references (sources)	AbstractIn this paper number of some dichalcones (1-6) were prepared by reaction of one mole of acetone with two moles of benzaldehyde and benzaldehydes substituted (2-methoxy, 4-methoxy, 3, 4-dimethoxy, 2-chloro and 4-nitro) in the presence of (10%) sodium hydroxide as a base. Pyrazolenes (7-12) were prepared from the reaction of dichalcones (1-6) with acetic hydrazide in the presence of (45%) sodium hydroxide as a base. Isooxazoline (13-18) were prepared from the reaction of dichalcones (1-6) with hydroxyl amine hydrochloride in the presence of (10%) sodium hydroxide as a base. These compound were studied and identified by physical and spectral methods.
Recommended supporting books and references (scientific journals, reports...)	
Electronic references, websites	

Course Description Form

1. Course Name:	
Biochemistry	
2. Course Code : KH	
3. Semester / Year:	
(Fourth) 2025-2026	
4. Date this description was prepared	
18/9/2025	
5. forms of attendance available	
In – person class in addition to the class for support class by used googleclass room /	
6. Number of study hours (total) / Number of units (total)	
2 hours per week / 4 unite	
7.Name the course administrator, if more than one name	
Asra'a Ismail Yaseen Altaii Email: altaiiasr@tu.edu.iq	
Subject Objectives	• Enabling female students to reach higher levels of scientific and laboratory knowledge of life chemistry reactions. • Enabling female students to obtain the principles of the laws of biochemistry and their applications. • Students obtain knowledge of the mechanism of analysis of life compounds. • The ability to understand metabolic pathways, separate them, analyze and interpret them. • Developing thinking and research skills into life compounds and their importance in healthy human life

	• Effective contribution and use of modern technology in understanding metabolic pathways through advanced means. • Using e-learning and accessing the best electronic means and programs to consolidate theoretical and practical scientific material
9. 9. Teaching and Learning Strategies	
Strategy	Using teaching methods through: 1- Providing female students with the basics of pure theoretical sciences through methodological theoretical lectures. (Recitation methods) 2- Developing students' ability to analyze and discuss results through discussion circles. 3- Providing female students with the principles of scientific research through scientific laboratories to perform various experiments. ((Methods of solving problems)) 4- Building the student's scientific personality by encouraging them to give seminars and participate in student conferences. (Deductive methods) 5- Developing female students' abilities and creating electronic meetings to master the scientific subject through electronic classes

10. Course structure: the study starts on 12/9/2023 and ends on 9/5/2024

week	W watches	Learning outcomes required	Unit name or the topic	Method learning	Road evaluation
September 2	2	Adding learning outcomes and introducing the interactions of life compounds and their impact on the health of the organism	Bioenergetics	is a theoretical subject using standard methods, discussion,	written exams, in addition to attendance, performance, and electronic class follow-up
September 3	2	Energy structure			

September 4	2	Redox reaction			
October 1	2	metabolism			
October 2	2	Glycolysis			
October 3		Fat of pyruvate			
October 3		Crebs cycle			
October 4		Pentose ph. pathway			
November 1		Glycogenesis and glycogenlysis			
November 2		gluconeogenesis			
November 3		photosynthesis			
November 4		Metabolism of lipids			
December 1		Beta oxidation			
December 2		Fatty acids synthesis			
December 3		Cholesterol synthesis			
December 4		Ketons body			
January 1		Relation keton body with energy			
February 1		Relation metabolisim of CHO and lipid			
February 2		Digesting of protein			
February 3		Nitrogen balance			
February 4		Metabolism of amino acid			
April 21		Metabolism of protein			
March	Application teaching				
April 31		Urea cycle			
May 1		Biosynthesis of protein			
May		Genetic			

11. course evaluation	
The grade is distributed out of 50% according to the tasks assigned to the student , such as daily preparation , daily exams , and oral exams….. etc End exam by 50% , final grade of 100%.....	
12. learning and teaching resources	
Required ks (methodology)	Biochemistry / Talal Alnajafi
Main references (sources)	Biochemistry / Kholah Al Flaih
Scientific journals , reports…..	Basics of biochemistry / Professor Dr. Sami Al-Muzaffar Biochemistry / Khaled Al-Qaisi
Electronic References, Websites	https://scholar.google.com/ https://www.sciencedirect.com/ https://www.researchgate.net/

Course Description Form

1. Course Name:	
Organic synthesis / Stage Four	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Salwa Abdul Sattar Jabbar Email: s.abd@tu.edu.iq	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. 2- Encouraging students to acquire knowledge and information and the ability to draw conclusions. 3- Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure					
Week	Hours	Required learning outcomes	Name of the unit or topic	Learning method	Evaluation method
October 1	2	Presentation method Discussion method	Infrared Spectroscopy	Standard method, practical method	Grades and exams
October 2	2	Presentation method Discussion method	Infrared Spectroscopy	Standard method, practical method	Grades and exams
October 3	2	Presentation method Discussion method	Infrared Spectroscopy	Standard method, practical method	Grades and exams
October 4	2	Presentation method Discussion method	Infrared Absorption Mechanism	Standard method, practical method	Grades and exams
November1	2	Presentation method Discussion method	Factors Affecting Band Positions	Standard method, practical method	Grades and exams
November2	2	Presentation method Discussion method	Active Groups and Their Appearance	Standard method, practical method	Grades and exams
November3	2	Presentation method Discussion method	Infrared Applications	Standard method, practical method	Grades and exams
November4	2	Presentation method Discussion method	NMR Spectroscopy	Standard method, practical method	Grades and exams
December1	2	Presentation method Discussion method	Magnetic and Non-Magnetic Nuclei	Standard method, practical method	Grades and exams
December 2	2	Presentation method Discussion method	Monthly Exam	Standard method, practical method	Grades and exams
December 3	2	Presentation method Discussion method	Chemical Shift	Standard method, practical method	Grades and exams
December 4	2	Presentation method Discussion method	Factors Affecting Chemical Shift	Standard method, practical method	Grades and exams
January 1	2	Presentation method Discussion method	Unsaturated Systems	Standard method, practical method	Grades and exams
January 2	2	Presentation method Discussion method	Band Splitting and Its Causes	Standard method, practical method	Grades and exams
January 3	2	Presentation method Discussion method	Monthly Exam	Standard method, practical method	Grades and exams

January 4		Presentation method Discussion method	Applications and Examples of NMR Spectroscopy	Standard method, practical method	Grades and exams
February 1	2	Presentation method Discussion method	Application Period	Standard method, practical method	Grades and exams
February 2	2	Presentation method Discussion method	Application Period	Standard method, practical method	Grades and exams
March 1	2	Presentation method Discussion method	Application Period	Standard method, practical method	Grades and exams
March 2	2	Presentation method Discussion method	Application Period	Standard method, practical method	Grades and exams
March 3	2	Presentation method Discussion method	Application Period	Standard method, practical method	Grades and exams
March 4	2	Presentation method Discussion method	Mass Spectroscopy, Ionization Process, Crushing Process, Components of Mass Spectrometer, Sample Placement Unit and Its Types	Standard method, practical method	Grades and exams
April 1	2	Presentation method Discussion method	Different Methods of Ionization Process, Crushing Mechanism of Positive Ions	Standard method, practical method	Grades and exams
April 2	2	Presentation method Discussion method	Chemical Ionization and ,Ionization by Electric Field Separation or Sorting Unit Ions	Standard method, practical method	Grades and exams
April 3	2	Presentation method Discussion metho	Separation or Sorting Unit Ions	Standard method, practical method	Grades and exams
April 4	2	Presentation method Discussion method	Chemical ionization and ,ionization by an electric field	Standard method, practical method	Grades and exams
May 1	2	Presentation method Discussion method	Ion separation or sorting unit	Standard method, practical method	Grades and exams
May 2	2	Presentation method Discussion method	Measurement and detection methods	Standard method, practical method	Grades and exams
May 3,4	2	Presentation method Discussion method			

11. Course Evaluation

Distribution of grades out of 100 according to tasks assigned to the student such as daily attendance, daily and monthly exams, reports, etc.

12. Learning and Teaching Resources	
Required textbooks (methodology if available)	Chemistry of Transition Elements / Chemistry Department
Main references (sources)	Spectrometric identification of organic 1 compounds by Robert M. Silverstein , Francis X . Webster and David J.Kiemle , 7th (2005).
Recommended supplementary books and references (scientific journals, reports...)	Structure Determination of Organic Compounds by E. Pretsch, P. Buhlmann, and C. Affolter , (2000)
Electronic references, internet sites	1- Silverstein , Francis X . Webster and David J.Kiemle , 7th (2005).

Course Description Form

1. Course Name: Indesterial Chemistry - Fourth Stage
2. Course Code:
3. Semester / Year: Course for the academic year 2025-2026
4. Description Preparation Date: 18/9/2024
5. Available Attendance Forms:
Class attendance + electronic classes on the Google Classroom platform will be a supporting class for the in-person class and according to the controls and instructions of the Ministry of Higher Education and Scientific Research.
6. Number of Credit Hours (Total) / Number of Units (Total)
60 hours / 7 units
7. Course administrator's name (mention all, if more than one name)
Name: Eman Ayoob Yass Email: emanaywb@tu.edu.iq
8. Course Objectives

Course Objectives • Developing students' ability by identifying the most important scientific concepts and rules that must be followed by students to complete scientific research. • Urging students to obtain knowledge, information and the ability to draw conclusions. • Preparing students to practice the teaching profession and knowing how to write scientific research.	• • •

9. Teaching and Learning Strategies	
Strategy	1. The standard method (giving lectures). 2. The method of discussion and interrogation. 3. Method of solving problems. 4. Brainstorming method.

10. Course Structure

The week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
September 3	2		Petrochemicals	Standard method And discussion	Class performance and exams
September 4	2		Oil origin	Standard method And discussion	Class performance and exams
October 1	2		Its nature and classification	Standard method And discussion	Class performance and exams
October 2	2		Crude oil evaluation	Standard method And discussion	Class performance and exams
October 3	2		Thermal solution of alkenes	Standard method And discussion	Class performance and exams
October 4	2		Monthly exam	Standard method And discussion	Class performance and exams
November 1	2		Aromatic compounds	Standard method And discussion	Class performance and exams
November 2	2		Oxidation in petrochemical industries	Standard method And discussion	Class performance and exams
November 3	2		Halogen compounds	Standard method And discussion	Class performance and exams
November 4	2		Corrosion in chemical industries	Standard method And discussion	Class performance and exams
December1	2		Factors affecting the chemical industries	Standard method	Class performance

				And discussion	and exams
December2	2		Monthly exam	Standard method And discussion	Class performance and exams
December3	2		Water treatment for industrial purposes	Standard method And discussion	Class performance and exams
December4	2		Industrial pollution	Standard method And discussion	Class performance and exams
January1	2		Industrial pollution of water, air and land	Standard method And discussion	Class performance and exams
January2	2		Cement industry	Standard method And discussion	Class performance and exams
January3 January4	2		Pesticides and fertilizers industry	----------	----------
	2		Monthly exam	----------	---------
February 1	2		Spring break	Standard method And discussion	Class performance and exams
February 1	2		Spring break	Standard method And discussion	Class performance and exams
February 1	2		Pesticides and fertilizers industry	Standard method And discussion	Class performance and exams
February 1	2		Raw materials, their specifications and uses	Standard method And discussion	Class performance and exams
March 1	2		Benefits of fertilizers and pesticides	Standard method And discussion	Class performance and exams
March 2	2		Pesticides and fertilizers industry	Standard method And discussion	Class performance and exams
March 3	2		Paper Industry	Standard method And discussion	Class performance and exams
March 4	2		School application	Standard method And discussion	Class performance and exams

April 1	2		School application	Standard method And discussion	Class performance and exams
April 2	2		School application	Standard method And discussion	Class performance and exams
April 3	2		School application	Standard method And discussion	Class performance and exams
April 4	2		School application	Standard method And discussion	Class performance and exams
Mays1	2		Sulfur industries	Standard method And discussion	Class performance and exams
Mays 2	2		Perfumes	Standard method And discussion	Class performance and exams
Mays 3	2		Final practical exam	Standard method And discussion	Class performance and exams

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 ks (methodology)	
Main references (sources)	
Scientific journals , reports…..	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Practical diagnosis / Stage Four	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
180 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Ahmed Hachim Sultan Email: aSultan@tu.edu.iq	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. 2- Encouraging students to acquire knowledge and information and the ability to draw conclusions. 3- Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure

Week	Hours	Required learning outcomes	Preliminary synthesis	Learning method	Evaluation method
October 1	2	Presentation method Discussion method	Solubility	Standard method, practical method	Grades and exams
October 2	2	Presentation method Discussion method	Sodium melting	Standard method, practical method	Grades and exams
October 3	2	Presentation method Discussion method	Sodium melting and melting point determination	Standard method, practical method	Grades and exams
October 4	2	Presentation method Discussion method	Double bond detection	Standard method, practical method	Grades and exams
Novembe r1	2	Presentation method Discussion method	Aldehydes and ketones detection and differentiation	Standard method, practical method	Grades and exams
Novembe r2	2	Presentation method Discussion method	Monthly exam with submission of first report	Standard method, practical method	Grades and exams
Novembe r3	2	Presentation method Discussion method	Detection of esters, anhydrides and tannins	Standard method, practical method	Grades and exams
Novembe r4	2	Presentation method Discussion method	Detection of carboxylic acids, amines and phenols	Standard method, practical method	Grades and exams
December 1	2	Presentation method Discussion method	Monthly exam with submission of second report	Standard method, practical method	Grades and exams
December 2	2	Presentation method Discussion method	Preparation of organic derivatives	Standard method, practical method	Grades and exams
December 3	2	Presentation method Discussion method	Infrared spectrum analysis	Standard method, practical method	Grades and exams
December 4	2	Presentation method Discussion method	Reading the ranges of active groups in organic compounds	Standard method, practical method	Grades and exams
January 1	2	Presentation method Discussion method	Reading the ranges of active groups in substituted compounds	Standard method, practical method	Grades and exams

January 2	2	Presentation method Discussion method	Monthly exam with submission of third report	Standard method, practical method	Grades and exams
January 3	2	Presentation method Discussion method	Infrared spectrum applications and examples	Standard method, practical method	Grades and exams
January 4		Presentation method Discussion method	NMR spectrum applications and examples	Standard method, practical method	Grades and exams
February 1	2	Presentation method Discussion method	Application period	Standard method, practical method	Grades and exams
February 2	2	Presentation method Discussion method	Application period	Standard method, practical method	Grades and exams
March 1	2	Presentation method Discussion method	Application period	Standard method, practical method	Grades and exams
March 2	2	Presentation method Discussion method	Application period	Standard method, practical method	Grades and exams
March 3	2	Presentation method Discussion method	Application period	Standard method, practical method	Grades and exams
March 4	2	Presentation method Discussion method	Application period	Standard method, practical method	Grades and exams
April 1	2	Presentation method Discussion method	Unknown diagnosis No. 1	Standard method, practical method	Grades and exams
April 2	2	Presentation method Discussion method	Unknown diagnosis No. 1 and submission of report	Standard method, practical method	Grades and exams
April 3	2	Presentation method Discussion metho	Unknown diagnosis No. 2	Standard method, practical method	Grades and exams Grades and exams
April 4	2	Presentation method Discussion method	Unknown diagnosis No. 2 And submitting the anonymous diagnosis	Standard method, practical method	Grades and exams
May 1	2	Presentation method Discussion method	And submitting the anonymous diagnosis report No. 3 and submitting the monthly	Standard method, practical method	Grades and exams
May 2	2	Presentation method Discussion method	exam report with the submission of the fourth report	Standard method, practical method	Grades and exams
May 3,4	2	Presentation method Discussion method	exam report with the submission of the fourth report		

11. Course Evaluation

Distribution of grades out of 100 according to tasks assigned to the student such as daily attendance, daily and monthly exams, reports, etc.

12. Learning and Teaching Resources	
Required textbooks (methodology if available)	Chemistry of Transition Elements / Chemistry Department
Main references (sources)	Spectrometric identification of organic 1 compounds by Robert M. Silverstein , Francis X . Webster and David J.Kiemle , 7th (2005).
Recommended supplementary books and references (scientific journals, reports...)	Structure Determination of Organic Compounds by E. Pretsch, P. Buhlmann, and C. Affolter , (2000)
Electronic references, internet sites	1- Silverstein , Francis X . Webster and David J.Kiemle , 7th (2005).

Course Description Form

1. Course Name:	
Industrial Chemistry / Four Stage	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: MSc.Aya Ibrahim Ali Email: Aya.Ibrahim@tu.edu.iq	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. 2- Encouraging students to acquire knowledge and information and the ability to draw conclusions. 3- Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure					
Week	Hours	Required learning outcomes	Unit or topic name	Learning method	Evaluation method
October 1	3	Presentation method Discussion method	Soap Preperation	Standard method, practical method	Grades and exams
October 2	3	Presentation method Discussion method	Soap Preperation	Standard method, practical method	Grades and exams
October 3	3	Presentation method Discussion method	Extraction of edible oils	Standard method, practical method	Grades and exams
October 4	3	Presentation method Discussion method	Extraction of edible oils	Standard method, practical method	Grades and exams
November1	3	Presentation method Discussion method	Separation of n-paraffin	Standard method, practical method	Grades and exams
November2	3	Presentation method Discussion method	Separation of n-paraffin	Standard method, practical method	Grades and exams
November3	3	Presentation method Discussion method	Preparation of tooth paste	Standard method, practical method	Grades and exams
November4	3	Presentation method Discussion method	Preparation of tooth paste	Standard method, practical method	Grades and exams
December1	3	Presentation method Discussion method	Preparation of cellulose tertiary and secondary acetates	Standard method, practical method	Grades and exams
December 2	3	Presentation method Discussion method	Preparation of cellulose tertiary and secondary acetates	Standard method, practical method	Grades and exams
December 3	3	Presentation method Discussion method	Preparation of resin phenol formaldehyde	Standard method, practical method	Grades and exams
December 4	3	Presentation method Discussion method	Preparation of resin phenol formaldehyde	Standard method, practical method	Grades and exams
January 1	3	Presentation method Discussion method	Preparation of phthalic alkyd resin	Standard method, practical method	Grades and exams
January 2	3	Presentation method Discussion method	Preparation of phthalic alkyd resin	Standard method, practical method	Grades and exams
January 3	3	Presentation method Discussion method	adhesives	Standard method, practical method	Grades and exams
January 4			First Semester Exams		
February 1	3	Presentation method Discussion method	adhesives	Standard method, practical method	Grades and exams
February 2	3	Presentation method Discussion method	Preparation of ammonium sulfate	Standard method, practical method	Grades and exams
March 1	3	Presentation method Discussion method	Calculating the percentage of free fatty acids in oils	Standard method, practical method	Grades and exams
March 2	3	Presentation method Discussion method	Calculating the percentage of free fatty acids in oils	Standard method, practical method	Grades and exams

March 3	3	Presentation method Discussion method	Calculating the percentage of free fatty acids in soap	Standard method, practical method	Grades and exams
March 4	3	Presentation method Discussion method	Calculating the percentage of free fatty acids in soap	Standard method, practical method	Grades and exams
April 1	3	Presentation method Discussion method	Calculating the percentage of free soada in soap	Standard method, practical method	Grades and exams
April 2	3	Presentation method Discussion method	Calculating the percentage of free soada in soap	Standard method, practical method	Grades and exams
April 3	3	Presentation method Discussion method	Preparation of Phenolphthalin Indicator	Standard method, practical method	Grades and exams
April 4	3	Presentation method Discussion method	Preparation of Phenolphthalin Indicator	Standard method, practical method	Grades and exams
May 1	3	Presentation method Discussion method	Preparation of indeco dyes	Standard method, practical method	Grades and exams
May 2	3	Presentation method Discussion method	Preparation of azo dyes	Standard method, practical method	Grades and exams
May 3	3	Presentation method Discussion method	Dyeing of fibers	Standard method, practical method	Grades and exams
May 4			Second semester exam		
May 15			Final exams		

11. Course Evaluation	
Distribution of grades out of 100 according to tasks assigned to the student such as daily attendance, daily and monthly exams, reports, etc.	
12. Learning and Teaching Resources	
Required textbooks (methodology if available)	Industrial Chemistry / Chemistry Department
Main references (sources)	
Recommended supplementary books and references (scientific journals, reports...)	
Electronic references, internet sites	

Course description form

1. Course name
Measurement and evaluation for the fourth stage
2. Course code
3. Semester/year
Year 2025-2026
4. The date this description was prepared
18/9/2025
5. Available forms of attendance
Attend my class + electronic class onGoogle class room will be a supporting class for the in-person class according to the controls and instructions of the Ministry of Higher Education and Scientific Research.
6. Number of study hours (total) / number of units (total)
4 hours per week = 120 hours / units 2 units
7. Name of the course administrator (if more
Name: M.M. Saood Rajib Hassan Email: Saood.r@tu.edu.iq
From a name mentioned)
8. Course objectives

The curriculum aims to prepare students to practice the teaching profession by learning about: 1- Many concepts and terms, including measurement, testing, and evaluation. 2- Types of achievement tests, how they are formulated, and their advantages and disadvantages. 3- Providing the Ministry of Education with staff specialized in educational guidance in secondary schools.	Objectives of the study subject
9. Teaching and learning strategies	
The standard method (giving lectures). _ Method of discussion and interrogation Method of solving problems.	The strategy

Evaluation method	Learning method	Name of the unit or topic	Required learning outcomes	hours	the week
Class performance and exams	Discussion and questioning	An overview of the development of evaluation and measurement		2	September -3
Class performance and exams	Discussion and questioning	Concepts of evaluation, measurement, and testing and the relationship between them		2	September 4
Class performance and exams	Discussion and questioning	The importance of evaluation and measurement in the educational process		2	October-1
Class performance and exams	Discussion and questioning	Types of educational calendar		2	October-2
Class performance and exams	Discussion and questioning	An overview of the development of evaluation and measurement		2	October-3
Class performance and exams	Discussion and questioning	Types of educational calendar		2	October-4
Class performance and exams	Discussion and questioning	Achievement tests set by the teacher		2	November 1
Class performance and exams	Discussion and questioning	Test map		2	November 2
Class performance and exams	Discussion and questioning	Essay tests		2	November 3
Class performance and exams	Discussion and questioning	Short answer tests		2	November 4
Class performance and exams	Discussion and questioning	Performance tests		2	December 1
Class performance and exams	Discussion and questioning	Objective tests		2	December 2

Class performance and exams	Discussion and questioning	Objective tests		2	December 3
Class performance and exams	Discussion and questioning	Analyze and improve test items		2	December 4
2					January 1
		Spring break from 1/14/2024 until 1/28/2024			January 2
Class performance and exams	Discussion and questioning	Ease factor		2	February 1
2					February 2
Class performance and exams	Discussion and questioning	Discrimination coefficient		2	February 3
Class performance and exams	Discussion and questioning	Good test specifications		2	February 4
Class performance and exams	Discussion and questioning	Consistency		2	April 3
Class performance and exams	Discussion and questioning	Objectivity and comprehensiveness		2	April 4
Class performance and exams	Discussion and questioning	Improving some non-test evaluation methods		2	Mays1

11. Course evaluation
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. The degree is distributed through several channels: 1- Formative (formative) assessment through daily exams, observing and following up on the student's performance in class discussions and homework assignments, and classroom evaluation. This grade does not exceed 20% of the total. 2- Diagnostic evaluation of the semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) exams for each semester, two exams, to extract the annual endeavor before entering the final exams.
12. Learning and teaching resources

Evaluation and Measurement, written by Mustafa Mahmoud Al-Imam and others.	Required textbooks (methodology, if any)
- Evaluation and measurement in education and psychology, Sami Melhem, 2000. 2- Measurement and Evaluation in Education, Touma George Al-Khoury, 2008. 3- Educational measurement and evaluation in the teaching process, Salah El-Din Mahmoud Allam, 2007.	Main references (sources)
Access to everything recent and published in peer-reviewed scientific journals	Recommended supporting books and references (scientific journals, reports...)
http://www.alkutubcafe.com/book/83rjar.html	Electronic references, Internet sites

Course Description Form

1. Course Name:	
Industry of Chemistry / third Stage	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. MOHAMMED GAZEE ABED ALKAREEM Email: mgchemo@tu.edu.iq	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. 2- Encouraging students to acquire knowledge and information and the ability to draw conclusions. 3- Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure					
Week	Hours	Required learning outcomes		Learning method	Evaluation method
October 1	2	Presentation method Discussion method	Introduction of polymer	Standard method, practical method	Grades and exams
October 2	2	Presentation method Discussion method	Process of polymers	Standard method, practical method	Grades and exams
October 3	2	Presentation method Discussion method	Molecular of polymers	Standard method, practical method	Grades and exams
October 4	2	Presentation method Discussion method	Kinds of polymers	Standard method, practical method	Grades and exams
November1	2	Presentation method Discussion method	Solid of polymers	Standard method, practical method	Grades and exams
November2	2	Presentation method Discussion method	Flexible of polymers	Standard method, practical method	Grades and exams
November3	2	Presentation method Discussion method	Exam 1	Standard method, practical method	Grades and exams
November4	2	Presentation method Discussion method	Nomenclature of polymers	Standard method, practical method	Grades and exams
December1	2	Presentation method Discussion method	Polymerization	Standard method, practical method	Grades and exams
December 2	2	Presentation method Discussion method	Mechanism of polymers	Standard method, practical method	Grades and exams
December 3	2	Presentation method Discussion method	Additives to polymers	Standard method, practical method	Grades and exams
December 4	2	Presentation method Discussion method	Ionic addition	Standard method, practical method	Grades and exams
January 1	2	Presentation method Discussion method	Ionic mechanism	Standard method, practical method	Grades and exams
January 2	2	Presentation method Discussion method	Inonic polmeraization	Standard method, practical method	Grades and exams
January 3	2	Presentation method Discussion method	Free radical	Standard method, practical method	Grades and exams
January 4			Condensation POLYMER		
February 1	2	Presentation method Discussion method	Exam	Standard method, practical method	Grades and exams
February 2	2	Presentation method Discussion method	Plastic	Standard method, practical method	Grades and exams
March 1	2	Presentation method Discussion method	Industry of rubber	Standard method, practical method	Grades and exams
March 2	2	Presentation method Discussion method	Vulcanization	Standard method, practical method	Grades and exams
March 3	2	Presentation method Discussion method	Vibers	Standard method, practical method	Grades and exams
March 4	2	Presentation method Discussion method	Analyses of polymers	Standard method, practical method	Grades and exams

April 1	2	Presentation method Discussion method	Spectrum of polymers	Standard method, practical method	Grades and exams
April 2	2	Presentation method Discussion method	Exam	Standard method, practical method	Grades and exams
April 3	2	Presentation method Discussion method	Test of distinguish	Standard method, practical method	Grades and exams
April 4	2	Presentation method Discussion method	X ray of polmers	Standard method, practical method	Grades and exams
May 1	2	Presentation method Discussion method	Thermal analeses	Standard method, practical method	Grades and exams
May 2	2	Presentation method Discussion method	Physical properties	Standard method, practical method	Grades and exams
May 3			Exam 4		
May 4			General review	Problem-solving method	
May 15					

11. Course Evaluation	
Distribution of grades out of 100 according to tasks assigned to the student such as daily attendance, daily and monthly exams, reports, etc.	
12. Learning and Teaching Resources	
Required textbooks (methodology if available)	Foundations of organic chemistry
Main references (sources)	Morisson and boyd
Recommended supplementary books and references (scientific journals, reports...)	
Electronic references, internet sites	

Course Description Form

1. Course Name:	
Instrumental of Chemical Analysis / Fourth Stage	
2. Course Code	
3. Semester / Year	
Annual/ 2025-2026	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures , online classes (Classroom) and practical in lab.	
6. Number of Credit Hours (Total) / Number of Units (Total)	
180 hours / 9 units	
7. Course administrator's name (mention all, if more than one name)	
Name: prof. Dr. Mohsin Hamza Bakir Email: dr.mhb@tu.edu.iq	
8. Course Objectives	
Course Objectives	1- Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. 2- Encouraging students to acquire knowledge and information and the ability to draw conclusions. 3- Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure					
Week	Hours	Required learning outcomes	Unit or topic name	Learning method	Evaluation method
October 1	2	Presentation method Discussion method	Instrumental Analysis: Introduction	Standard method, practical method	Grades and exams
October 2	2	Presentation method Discussion method	Electromagnetic Radiation , Regions, Interaction with matter	Standard method, practical method	Grades and exams
October 3	2	Presentation method Discussion method	UV-Vis. Absorption Spectrophotometry: Principles	Standard method, practical method	Grades and exams
October 4	2	Presentation method Discussion method	Instrumentations	Standard method, practical method	Grades and exams
November1	2	Presentation method Discussion method	Applications	Standard method, practical method	Grades and exams
November2	2	Presentation method Discussion method	Turbidimetry and Nephelometry	Standard method, practical method	Grades and exams
November3	2	Presentation method Discussion method	IR, Applications	Standard method, practical method	Grades and exams
November4	2	Presentation method Discussion method	1st Exam	Standard method, practical method	Grades and exams
December1	2	Presentation method Discussion method	Atomic Spectrophotometry (Absorption and Emission)	Standard method, practical method	Grades and exams
December 2	2	Presentation method Discussion method	Electroanalytical Methods: principles	Standard method, practical method	Grades and exams
December 3	2	Presentation method Discussion method	Potentiometry: principles and requirements	Standard method, practical method	Grades and exams
December 4	2	Presentation method Discussion method	Ion Selective Electrods: principles and types	Standard method, practical method	Grades and exams
January 1	2	Presentation method Discussion method	Voltammetry & Polarography	Standard method, practical method	Grades and exams
January 2	2	Presentation method Discussion method	Principles, Kinds, and requirements	Standard method, practical method	Grades and exams
January 3	2	Presentation method Discussion method	Qualitative & Quantitative analysis	Standard method, practical method	Grades and exams
January 4			First Semester Exams		
February 1	2	Presentation method Discussion method	First Semester Exams	Standard method, practical method	Grades and exams
February 2	2	Presentation method Discussion method	Coloumetry: principles and requirements	Standard method, practical method	Grades and exams
March 1	2	Presentation method Discussion method		Standard method, practical method	Grades and exams
March 2	2	Presentation method Discussion method		Standard method, practical method	Grades and exams
March 3	2	Presentation method Discussion method		Standard method, practical method	Grades and exams

March 4	2	Presentation method Discussion method		Standard method, practical method	Grades and exams
April 1	2	Presentation method Discussion method		Standard method, practical method	Grades and exams
April 2	2	Presentation method Discussion method		Standard method, practical method	Grades and exams
April 3	2	Presentation method Discussion method	Coloumetric Titrations	Standard method, practical method	Grades and exams
April 4	2	Presentation method Discussion method	Conductivity Measurements	Standard method, practical method	Grades and exams
May 1	2	Presentation method Discussion method	Thermal methods: principles	Standard method, practical method	Grades and exams
May 2	2	Presentation method Discussion method	Types	Standard method, practical method	Grades and exams
May 3			Applications		
May 4			Exam	Problem-solving method	
May 15			Final exams		

11. Course Evaluation	
Distribution of grades out of 100 according to tasks assigned to the student such as daily attendance, daily and monthly exams, reports, etc.	
12. Learning and Teaching Resources	
Required textbooks (methodology if available)	Instrumental of Chemical Analysis
Main references (sources)	التحليل الكيميائي الالي – عبد المحسن عبد الحميد الحيدري 1991
Recommended supplementary books and references (scientific journals, reports...)	Fundamentals of Analytical Chemistry, 8th Edition, 2004 Douglas A. Skoog , Donald M. West, F. James Holler, Stanley R. Crouch Stanford University San Jose State University of Kentucky Michigan State University أسس الكيمياء التحليلية: ترجمة د. زهير متي قصير وآخرون،1986 طرق التحليل الالي د. فتحي احمد عبيد
Electronic references, internet sites	Google scholar, Science Direct ,TMI, MSDS

Course Description Form

1. Course Name:	
Biochemistry Laboratory / Second Stage	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Ms.Ayat Jasim Mohammed Email: ayat.mohammed@tu.edu.iq	
8. Course Objectives	
Course Objectives	**1-** Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. **2-** Encouraging students to acquire knowledge and information and the ability to draw conclusions. **3-** Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure

Week	Hours	Required learning outcomes	Unit or topic name	Learning method	Evaluation method
October 1	3	Presentation method Discussion method	Carbohydrate , Molisch's test	Standard method, practical method	Grades and exams
October 2	3	Presentation method Discussion method	Benedict test	Standard method, practical method	Grades and exams
October 3	3	Presentation method Discussion method	Barfoed test	Standard method, practical method	Grades and exams
October 4	3	Presentation method Discussion method	Seliwanoff's test	Standard method, practical method	Grades and exams
November1	3	Presentation method Discussion method	Bial's test	Standard method, practical method	Grades and exams
November2	3	Presentation method Discussion method	Osazone Crystal test	Standard method, practical method	Grades and exams
November3	3	Presentation method Discussion method	Fehling test	Standard method, practical method	Grades and exams
November4	3	Presentation method Discussion method	Hydrolysis of disaccharides by acid, their detection, and comparison with monosaccharides.	Standard method, practical method	Grades and exams
December1	3	Presentation method Discussion method	Detection of polysaccharides , Acid hydrolysis of starch	Standard method, practical method	Grades and exams
December 2	3	Presentation method Discussion method	Identification of an unknown carbohydrate	Standard method, practical method	Grades and exams
December 3	3	Presentation method	Lipids , Solubility of lipids	Standard method, practical method	Grades and exams

		Discussion method			
December 4	3	Presentation method Discussion method	Saponification value of fat	Standard method, practical method	Grades and exams
January 1	3	Presentation method Discussion method	Detection of saturated and unsaturated fatty acids	Standard method, practical method Standard method, practical method	Grades and exams
January 2	3	Presentation method Discussion method	Acrolein test	Standard method, practical method	Grades and exams
January 3	3	Presentation method Discussion method	Estimation of blood cholesterol	Standard method, practical method	Grades and exams
January 4	3	Presentation method Discussion method	First semester exam	Standard method, practical method	Grades and exams
February 1	3	Presentation method Discussion method	Proteins , Biuret test	Standard method, practical method	Grades and exams
February 2	3	Presentation method Discussion method	Ninhydrin test , Millons test	Standard method, practical method	Grades and exams
March 1	3	Presentation method Discussion method	Sakaguchi test , Xanthoproteic test	Standard method, practical method	Grades and exams
March 2	3	Presentation method Discussion method	Hopkin's – Cole test , Alkali labile sulfer test	Standard method, practical method	Grades and exams
March 3	3	Presentation method Discussion method	Precipitation by heavy metals , precipitation by acidic reagents	Standard method, practical method	Grades and exams
March 4	3	Presentation method Discussion method	Precipitation of proteins at their isoelectric point, precipitation by salting out	Standard method, practical method	Grades and exams

April 1	**3**	**Presentation method Discussion method**	**Vitamins, determination of vitamin C in foods, determination of vitamin A in some food materials**	**Standard method, practical method**	**Grades and exams**
April 2	**3**	**Presentation method Discussion method**	**Enzymes, detection of enzyme activity**	**Standard method, practical method**	**Grades and exams**
April 3	**3**	**Presentation method Discussion method**	**Detection of catalase enzyme activity**	**Standard method, practical method**	**Grades and exams Grades and exams**
April 4	**3**	**Presentation method Discussion method**	**Effect of temperature on the enzymatic reaction**	**Standard method, practical method**	**Grades and exams**
May 1	**3**	**Presentation method Discussion method**	**Effect of pH on the enzymatic reaction**	**Standard method, practical method**	**Grades and exams**
May 2	**3**	**Presentation method Discussion method**	**Detection of the chemical nature of the substance that makes up the enzyme**	**Standard method, practical method**	**Grades and exams**
May 3			**Second semester exam**		
May 4			**General review**	**Problem-solving method**	
May 15			**Final exams**		

11. Course Evaluation

Distribution of grades out of 100 according to tasks assigned to the student such as daily attendance, daily and monthly exams, reports, etc.

12. Learning and Teaching Resources

Required textbooks (methodology if available)	Biochemistry (Dr. Qusay Abdulqader Al-Jalabi)
Main references (sources)	Introduction to Biochemistry (Dr. Khawla Ahmed Al-Falih)
Recommended supplementary books and references (scientific journals, reports...)	Biochemistry (Dr. Talal Saeed Al-Najafi)
Electronic references, internet sites	

Course Description Form

1. Course Name:
Biology
2. Course Code:
Biology / first stage
3. Semester / Year:
2025
4. Description Preparation Date:
18/9/2025
5. Available Attendance Forms:
Class Lecture + Electronic Lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
70 hours.
7. Course administrator's name (mention all, if more than one name)
Name: Dunia Abed Hussain Email: Dunia _abed@tu.edu.iq
8. Course Objectives

Course Objectives	• Informing students of the most important biologists in the past. • To introduce female students to reproductive methods in plants and animals. • Female students understand the difference between the plant and animal cell.
9. Teaching and Learning Strategies	
Strategy	To provide students with knowledge of scientific goals and how to achieve them. To give students all that's modern on the side of biology that benefits them and to know what's in modern biology.

10- Course Structure

Week	Hours	Required learning outcomes	Unit or topic name	Learning method	Evaluation method
1	2		The five worlds include fungus primitives/ plant	Standard method, Text Method	Class performance and exams
2	2		Definition of qualities of life	Standard method, Text Method	Class performance and exams
3	2		Taxonomy	Standard method, Text Method	Class performance and exams
4	2		The chemistry of respiration and energy conversion	Standard method, Text Method	Class performance and exams
5			Physiology and chemistry of photosynthesis	Standard method, Text Method	Class performance and exams
6	2		Reproduction and growth in animals	Standard method, Text Method	Class performance and exams
7	2		Harmony in plants	Standard method, Text Method	Class performance and exams
8	2		The food chain	Standard method, Text Method	Class performance and exams
9	2		Branches of zoology	Standard method, Text Method	Class performance and exams
10	2		Animal cell	Standard method, Text Method	Class performance and exams
11	2		Physical properties of protoplasm	Standard method, Text Method	Class performance and exams
12	2		The germ cell.	Standard method, Text Method	Class performance and exams

13	2		Painting tissue.	Standard method, Text Method	Class performance and exams
14	2		Muscle tissue.	Standard method, Text Method	Class performance and exams
15	2		Final exams		

11. Course Evaluation	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc	
12. Learning and Teaching Resources	
Required textbooks (methodology if available)	Professor Dr. Nizar Mustafa Al-Mallah
Main references (sources)	Professor Dr. Hussein Ali Al-Saadi
Recommended supplementary books and references (scientific journals, reports...)	Biology author Peter Haven et al
Electronic references, internet sites	Any website related to biology

Course Description Form

1. Course Name: Headway for 2nd Year non-departmental
2. Course Code:
3. Semester / Year: 2025-2026
4. Description Preparation Date: 18/9/2025
5. Available Attendance Forms: Class lectures
6. Number of Credit Hours (Total) / Number of Units (Total): 60 hours / 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Israa Burhanuddin Abdurrahman Email: israaburhan@tu.edu.iq
8. Course Objectives

Course Objectives	1. Enabling the students to: ❖ Read and write in English ❖ Follow the basic rules of the English language. ❖ Understand the ways of life in English-speaking societies, especially the British and American, and some of the differences between them. ❖ Communicate linguistically. ❖ Understand the language of films and the internet. 2. Teaching the students English language in smooth and simple manner. 3. Urging the students to solve the exercises and apply the rules. 4. Encouraging them to continue learning English language lessons by following programs in English and listening to conversation. 5. Developing the Students' skills in expressing himself and his ability to speak orally. 6. Developing the students' conversational skills and reading skills through the exercises in the student book

9. Teaching and Learning Strategies

Strategy	• The standard method (giving lectures). • The text method. • Brainstorming method. • Some modern strategies.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1 Unit One & Two	1	Learning English sentences	Teaching tenses of English language	Lecture	Oral Test
October 2 Unit Three	1	Learning English sentences in negative and question forms	2nd Stage: Teaching how to ask questions	Lecture	Oral Test
October 3 Unit Four	1	Learning Forms of sentences	2nd Stage: Teaching got /have got in every day conversation.	Lecture	Oral Test
October 4 Unit Five	1	Learning the difference between using auxiliaries	2nd Stage: Teaching how can identify sentences in present or past	Lecture	Oral Test
November 1 Unit Six	1	Learning forms of verbs and the difference between much/many	2nd Stage: Using much/many	Lecture	Oral Test
November 2 Unit Seven	1	Learning Tenses and the difference between a few/ a little	2nd Stage: Using countable a few/a little of one syllable	Lecture	Oral Test
November 3 Unit Eight	1	Learning the forms of verbs	2nd Stage: The use of comparative and superlative	Lecture	Oral Test
November 4 Unit Nine	1	Learning the adjectives Learning regular and irregular verbs	2nd Stage: Adding er to adjectives	Lecture	Oral Test
December 1	1	Learning English sentences	2nd Stage: Practicing of present perfect	Lecture	Oral Test

Unit Ten					
December 2 Unit Eleven	1	Learning the difference between active and passive sentences	2nd Stage: Teaching adverbs	Lecture	Oral Test
December 3 Unit Twelve	1	Learning the forms of verbs	2nd Stage: Using word pairs	Lecture	Oral Test
December 4 Unit Thirteen	1	Learning tag questions with short answers	2nd Stage: Using short answers	Lecture	Oral Test
January 1 Unit Fourteen	1	Learning singular and plural	2nd Stage: making plural with regular and irregular	Lecture	Oral Test
January 2	1	Learning forms of sentences in interrogative	2nd Stage: How can use determiners in formulating questions and answers	Lecture	Oral Test
January 3	1	Learning forms of sentences in interrogative and negative	2nd Stage: Formulating positive and negative	Lecture	Oral Test
January 4	1	Learning forms of verbs	2nd Stage: Practicing two forms of present and past	Lecture	Oral Test
February 1	1	Learning English tenses	2nd Stage: Practicing question words	Lecture	Oral Test
February 2	1	Learning short answers	2nd Stage: Practicing can/can't	Lecture	Oral Test
March 1	1	Learning planning for future	2nd Stage: Practicing was/were	Lecture	Oral Test
March 2	1	Learning planning for future	2nd Stage: Practicing /s'/ plural	Lecture	Oral Test
March 3	1	Learning planning for future	2nd Stage: How to indicate time	Lecture	Oral Test
March 4	1	Learning the use of determiners	2nd Stage: Negative short answers	Lecture	Oral Test
April 1	1	Learning affirmative, negative and interrogative	2nd Stage: Using some/any, each /every, more/most	Lecture	Oral Test

		sentences			
April 2	1	Learning clauses and forms of verbs	2nd Stage: How to indicate place	Lecture	Oral Test
April 3	1	Learning clauses	2nd Stage: Teach jobs	Lecture	Oral Test
April 4	1	Learning forms of interrogative sentences	2nd Stage: Teach plural pronouns	Lecture	Oral Test
May 1	1		Revision	Lecture	Written Test
May 2	1		Revision	Lecture	Written Test
May 3&4	-------		Final Exams	----------	----------

11. Course Evaluation

First Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Second Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Total for the 1st and 2nd Courses: 50
Final Exam: 50
Final Grade: 100

12. Learning and Teaching Sources

Required textbooks (curricular books, if any)	The Ministry's prescribed book Headway
Main references (sources)	----------
Recommended books and references (scientific journal, reports	
Electronic References, Websites	https://elt.oup.com/student/headway/beg/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/preint4/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/int/?cc=global&selLanguage=en. https://sc.nahrainuniv.edu.iq/lectures/7092_new-headway-upper-intermediate-students-book.pdf.

Course Description Form

1. Course Name: Headway for 3rd Year non-departmental
2. Course Code:
3. Semester / Year: 2025-2026
4. Description Preparation Date: 18/9/2025
5. Available Attendance Forms: Class lectures
6. Number of Credit Hours (Total) / Number of Units (Total): 60 hours / 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Israa Burhanuddin Abdurrahman Email: israaburhan@tu. edu.iq
8. Course Objectives

Course Objectives	7. Enabling the students to: ❖ Read and write in English ❖ Follow the basic rules of the English language. ❖ Understand the ways of life in English-speaking societies, especially the British and American, and some of the differences between them. ❖ Communicate linguistically. ❖ Understand the language of films and the internet. 8. Teaching the students English language in smooth and simple manner. 9. Urging the students to solve the exercises and apply the rules. 10. Encouraging them to continue learning English language lessons by following programs in English and listening to conversation. 11. Developing the Students' skills in expressing himself and his ability to speak orally. 12. Developing the students' conversational skills and reading skills through the exercises in the student book

9. Teaching and Learning Strategies

Strategy	• The standard method (giving lectures). • The text method. • Brainstorming method. • Some modern strategies.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1 Unit One & Two	1	Learning English sentences	Introduction to auxiliary verbs	Lecture	Oral Test
October 2 Unit Three	1	Learning English sentences in negative and question forms	Introduction to tenses and auxiliary verbs	Lecture	Oral Test
October 3 Unit Four	1	Learning Forms of sentences	Teaching present simple	Lecture	Oral Test
October 4 Unit Five	1	Learning the difference between using auxiliaries	Teaching short answers and auxiliary verbs	Lecture	Oral Test
November 1 Unit Six	1	Learning forms of verbs and the difference between much/many	Teaching questions and auxiliary verbs	Lecture	Oral Test
November 2 Unit Seven	1	Learning Tenses and the difference between a few/ a little	Teaching the adverbs of present simple	Lecture	Oral Test
November 3 Unit Eight	1	Learning the forms of verbs	Teaching the adverbs of past simple	Lecture	Oral Test
November 4 Unit Nine	1	Learning the adjectives Learning regular and irregular verbs	Teaching the state verb of present continuous	Lecture	Oral Test
December 1 Unit Ten	1	Learning English sentences	Introduction to passive	Lecture	Oral Test

December 2 Unit Eleven	1	Learning the difference between active and passive sentences	Present simple and present continuous passives	Lecture	Oral Test
December 3 Unit Twelve	1	Learning the forms of verbs	Teaching past perfect	Lecture	Oral Test
December 4 Unit Thirteen	1	Learning tag questions with short answers	Teaching past perfect in positives and negatives	Lecture	Oral Test
January 1 Unit Fourteen	1	Learning singular and plural	Introduction to modal verbs	Lecture	Oral Test
January 2	1	Learning forms of sentences in interrogative	The form of modal verbs	Lecture	Oral Test
January 3	1	Learning forms of sentences in interrogative and negative	Modal verbs in obligation and positive	Lecture	Oral Test
January 4	1	Learning forms of verbs	modal verbs in affirmatives and negatives	Lecture	Oral Test
February 1	1	Learning English tenses	Using should/ought to/must	Lecture	Oral Test
February 2	1	Learning short answers	Modal verbs making request: can/could/will/would	Lecture	Oral Test
March 1	1	Learning planning for future	Modal verbs making offers: will/shall/should	Lecture	Oral Test
March 2	1	Learning planning for future	Introduction to future forms	Lecture	Oral Test
March 3	1	Learning planning for future	Introduction to present continuous in using will/going to	Lecture	Oral Test
March 4	1	Learning the use of determiners	Using will/going to	Lecture	Oral Test
April 1	1	Learning affirmative, negative and interrogative sentences	Introduction to like	Lecture	Oral Test
April 2	1	Learning clauses and forms of verbs	The use of relative clauses	Lecture	Oral Test

April 3	1	Learning clauses	The use of time clauses	Lecture	Oral Test
April 4	1	Learning forms of interrogative sentences	The use of If conditions	Lecture	Oral Test
May 1	1		Revision	Lecture	Written Test
May 2	1		Revision	Lecture	Written Test
May 3&4	-------		Final Exams	----------	----------

11. Course Evaluation

First Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Second Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Total for the 1st and 2nd Courses: 50
Final Exam: 50
Final Grade: 100

12. Learning and Teaching Sources

Required textbooks (curricular books, if any)	The Ministry's prescribed book Headway
Main references (sources)	----------
Recommended books and references (scientific journal, reports	
Electronic References, Websites	https://elt.oup.com/student/headway/beg/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/preint4/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/int/?cc=global&selLanguage=en. https://sc.nahrainuniv.edu.iq/lectures/7092_new-headway-upper-intermediate-students-book.pdf.

Course Description Form

1. Course Name:
Mathematics
2. Course Code:
Biology / first stage
3. Semester / Year:
2025-2026
4. Description Preparation Date:
18/9/2025
5. Available Attendance Forms:
Classroom and Google classroom
6. Number of Credit Hours (Total) / Number of Units (Total)
32 hours
7. Course administrator's name (mention all, if more than one name)
Name Fatin Haitham Moulood Emil : Fatin.Haitham@tu.edu.iq

8. Course Objectives	
Course Objectives	• To learn the basic concepts of calculus. • Understanding the connection between functions and their relationship to limits. • Identifying the differentiability of functions and their relationship to continuity. • Knowledge of the applications of differential and integral calculus in various sciences. •The ability to use differential and integral calculus in solving mathematical problems.

9. Teaching and Learning Strategies	
Strategy	• Use explanations and illustrations to present concepts. • Interact with students through discussions and practical exercises. • Use real-world examples and applications to clarify mathematical concepts.

10- Course Structure					
Week	**Hours**	**Required learning outcomes**	**Unit or topic name**	**Learning method**	**Evaluation method**
1-4	4 hours	Real numbers	real numbers and their properties	theoretical	exam, reports
5-8	4 hours	Functions	Functions, function composition, graphing functions	theoretical	General questions and discussion.
9-12	4 hours	Limits and continuity	Definition of limit and related theories; continuity and its theories	Theoretical	Report, Exams and discussions
13-16	4 hours	Derivation	Definition of derivatives and related theories	Theoretical.	Report, Exams .
17-20	4 hours	Derivative applications	Derivative applications	Theoretical	General questions and discussion with reports.
21-27	8 hours	Special functions	Trigonometric functions and their derivatives, and hyperbolic functions and their derivatives	Theoretical	General questions and discussion with reports.
28-31	4 hours	integration	Definition of definite and indefinite integrals and their applications	Theoretical.	Exams and discussions

11. Course Evaluation

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

12.Learning and teaching resources

Required textbooks (methodology, if applicable) : Thomas. G.B, Calculus and Analytic Geomatry, 4th , 1984.

Main references (sources): Khaled Ahmed Al-Samarrai: Differential and Integral Calculus.

Course Description Form

1. Course Name: **Headway / first year**
2. Course Code: ----------
3. Semester / Year: 2025-2026
4. Description Preparation Date: **18/9/2025**
5. Available Attendance Forms: Class lectures
6. Number of Credit Hours (Total) / Number of Units (Total): 60 hours / 14 Units
7. Course administrator's name (mention all, if more than one name)
Name: Lect. Ruqaiya Burhanuddin Abdurrahman Email: rabdurrahman@tu.edu.iq
8. Course Objectives

Course Objectives	13. Enabling the students to: ❖ Read and write in English ❖ Follow the basic rules of the English language. ❖ Understand the ways of life in English-speaking societies, especially the British and American, and some of the differences between them. ❖ Communicate linguistically. ❖ Understand the language of films and the internet. 14. Teaching the students English language in smooth and simple manner. 15. Urging the students to solve the exercises and apply the rules. 16. Encouraging them to continue learning English language lessons by following programs in English and listening to conversation.

	17. Developing the Students' skills in expressing himself and his ability to speak orally. 18. Developing the students' conversational skills and reading skills through the exercises in the student book

9. Teaching and Learning Strategies

Strategy	• The standard method (giving lectures). • The text method. • Brainstorming method. • Some modern strategies.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1 Unit One & Two	1		1st Stage: Introduction use auxiliary /am/is/are In speaking and reading. Unit two: use the subjects /he/she/they/we/I/you In practice grammar.	Lecture	Discussion and exam
October 2 Unit Three	1		1st Stage: using negative and positive on short answers and	Lecture	Discussion and exam
October 3 Unit Four	1		1st Stage: Using possessives in adj. and plural nouns	Lecture	Discussion and exam
October 4 Unit Five	1		1st Stage: Teaching present simple	Lecture	Discussion and exam
November 1 Unit Six	1		1st Stage: Teaching past simple	Lecture	Discussion and exam
November 2 Unit Seven	1		1st Stage: Teaching present continuous	Lecture	Discussion and exam
November 3	1		1st Stage: Teaching past continuous	Lecture	Discussion and

Unit Eight					exam
November 4 Unit Nine	1		1st Stage: Teaching past simple – irregular verbs	Lecture	Discussion and exam
December 1 Unit Ten	1		1st Stage: teach past simple in using questions and negatives	Lecture	Discussion and exam
December 2 Unit Eleven	1		1st Stage: Using can in positive and negatives	Lecture	Discussion and exam
December 3 Unit Twelve	1		1st Stage: Teaching model verbs	Lecture	Discussion and exam
December 4 Unit Thirteen	1		1st Stage: Teaching adverbs	Lecture	Discussion and exam
January 1 Unit Fourteen	1		1st Stage: using would like in questions	Lecture	Discussion and exam
January 2	1		1st Stage: Teaching some/any and the differences	Lecture	Discussion and exam
January 3	1		1st Stage: Teaching like and would like	Lecture	Discussion and exam
January 4	1		1st Stage: Teaching like and would like	Lecture	Discussion and exam
February 1	1		1st Stage: Teaching present simple and present continuous	Lecture	Discussion and exam
February 2	1		1st Stage: Teaching Yes/No questions	Lecture	Discussion and exam
March 1	1		1st Stage: Teaching future plans	Lecture	Oral Test
March 2	1		1st Stage: Teaching countable and uncountable	Lecture	Oral Test
March 3	1		1st Stage: Teaching the determiner the	Lecture	Discussion and exam
March 4	1		1st Stage: Teach the determiners	Lecture	Discussion and exam

			a/an		
April 1	1		1st Stage: Teaching prepositions	Lecture	Discussion and exam
April 2	1		1st Stage: Teaching numbers	Lecture	Discussion and exam
April 3	1		1st Stage: Teaching collars	Lecture	Discussion and exam
April 4	1		1st Stage: Teaching question words	Lecture	Discussion and exam
May 1	1		Revision	Lecture	Discussion and exam
May 2	1		Revision	Lecture	Discussion and exam
May 3&4	-------		Final Exams	----------	----------

11. Course Evaluation

First Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Second Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Total for the 1st and 2nd Courses: 50
Final Exam: 50
Final Grade: 100

12. Learning and Teaching Sources

Required textbooks (curricular books, if any)	The Ministry's prescribed book for all the stages
Main references (sources)	----------
Recommended books and references (scientific journal, reports	
Electronic References, Websites	https://elt.oup.com/student/headway/beg/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/preint4/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/int/?cc=global&selLanguage=en. https://sc.nahrainuniv.edu.iq/lectures/7092_new-headway-upper-intermediate-students-book.pdf.

Course Description Form

1. Course Name: **Headway / fourth year**
2. Course Code: ----------
3. Semester / Year: 2025-2026
4. Description Preparation Date: **18/9/2025**
5. Available Attendance Forms: Class lectures
6. Number of Credit Hours (Total) / Number of Units (Total): 60 hours / 14 Units
7. Course administrator's name (mention all, if more than one name)
Name: Assist.Lect. Basma Faisal Ali Email: basma.faisal@tu.edu.iq
8. Course Objectives

Course Objectives	19. Enabling the students to: ❖ Read and write in English ❖ Follow the basic rules of the English language. ❖ Understand the ways of life in English-speaking societies, especially the British and American, and some of the differences between them. ❖ Communicate linguistically. ❖ Understand the language of films and the internet. 20. Teaching the students English language in smooth and simple manner. 21. Urging the students to solve the exercises and apply the rules. 22. Encouraging them to continue learning English language lessons by following programs in English and listening to conversation. 23. Developing the Students' skills in expressing himself and his ability to speak orally. 24. Developing the students' conversational skills and reading skills through the exercises in the student book

9. Teaching and Learning Strategies

Strategy	• The standard method (giving lectures). • The text method. • Brainstorming method. • Some modern strategies.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1 Unit One & Two	1		1st Stage: Introduction use auxiliary /am/is/are In speaking and reading. Unit two: use the subjects /he/she/they/we/I/you In practice grammar.	Lecture	Discussion and exam
			2nd Stage: Teaching tenses of English language		
			3rd Stage: Introduction to auxiliary verbs		
			4th Stage: Teaching zero condition		
October 2 Unit Three	1		1st Stage: using negative and positive on short answers and	Lecture	Discussion and exam
			2nd Stage: Teaching how to ask questions		
			3rd Stage: Introduction to tenses and auxiliary verbs		
			4th Stage: Teaching first and second condition of IF		
October 3 Unit Four	1		1st Stage: Using possessives in adj. and plural nouns		

			2nd Stage: Teaching got /have got in every day conversation .	Lecture	Discussion and exam
			3rd Stage: Teaching present simple		
			4th Stage: Teaching tenses informal English spoken		
October 4 Unit Five	1		1st Stage: Teaching present simple	Lecture	Discussion and exam
			2nd Stage: Teaching how can identify sentences in present or past		
			3rd Stage: Teaching short answers and auxiliary verbs		
			4th Stage: Introduction to auxiliary verbs: be/do/have		
November 1 Unit Six	1		1st Stage: Teaching past simple	Lecture	Discussion and exam
			2nd Stage: Using much/many		
			3rd Stage: Teaching questions and auxiliary verbs		
			4th Stage: Introduction to full verbs		
November 2 Unit Seven	1		1st Stage: Teaching present continuous	Lecture	Discussion and exam
			2nd Stage: Using countable a few/a little of one syllable		
			3rd Stage: Teaching the adverbs of present simple		
			4th Stage: Teaching verbs of mind		
November 3 Unit Eight	1		1st Stage: Teaching past continuous		
			2nd Stage: The use of comparative and superlative		
			3rd Stage:		

			Teaching the adverbs of past simple 4th Stage: Teaching verbs of mind	Lecture	Discussion and exam
November 4 Unit Nine	1		1st Stage: Teaching past simple – irregular verbs 2nd Stage: Adding er to adjectives 3rd Stage: Teaching the state verb of present continuous 4th Stage: Teaching verbs possession	Lecture	Discussion and exam
December 1 Unit Ten	1		1st Stage: teach past simple in using questions and negatives 2nd Stage: Practicing of present perfect 3rd Stage: Introduction to passive 4th Stage: Teaching verbs certain other verbs	Lecture	Discussion and exam
December 2 Unit Eleven	1		1st Stage: Using can in positive and negatives 2nd Stage: Teaching adverbs 3rd Stage: Present simple and present continuous passives 4th Stage: Teaching active and passive	Lecture	Discussion and exam
December 3 Unit Twelve	1		1st Stage: Teaching model verbs 2nd Stage: Using word pairs 3rd Stage: Teaching past perfect 4th Stage: Teaching question forms	Lecture	Discussion and exam
December 4	1		1st Stage: Teaching adverbs		

Unit Thirteen			2nd Stage: Using short answers	Lecture	Discussion and exam
			3rd Stage: Teaching past perfect in positives and negatives		
			4th Stage: Asking for directions		
January 1 Unit Fourteen	1		1st Stage: using would like in questions	Lecture	Discussion and exam
			2nd Stage: making plural with regular and irregular		
			3rd Stage: Introduction to modal verbs		
			4th Stage: Asking for descriptions		
January 2	1		1st Stage: Teaching some/any and the differences	Lecture	Discussion and exam
			2nd Stage: How can use determiners in formulating questions and answers		
			3rd Stage: The form of modal verbs		
			4th Stage: Teaching direct questions		
January 3	1		1st Stage: Teaching like and would like	Lecture	Discussion and exam
			2nd Stage: Formulating positive and negative		
			3rd Stage: Modal verbs in obligation and positive		
			4th Stage: Using indirect questions		
January 4	1		1st Stage: Teaching like and would like	Lecture	Discussion and
			2nd Stage: Practicing two forms of present and past		
			3rd Stage:		

			modal verbs in affirmatives and negatives		exam
			4th Stage: Practicing possessives in different forms		
February 1	1		1st Stage: Teaching present simple and present continuous	Lecture	Discussion and exam
			2nd Stage: Practicing question words		
			3rd Stage: Using should/ought to/must		
			4th Stage: Forming negative questions		
February 2	1		1st Stage: Teaching Yes/No questions	Lecture	Discussion and exam
			2nd Stage: Practicing can/can't		
			3rd Stage: Modal verbs making request: can/could/will/would		
			4th Stage: Using will for prediction		
March 1	1		1st Stage: Teaching future plans	Lecture	Oral Test
			2nd Stage: Practicing was/were		
			3rd Stage: Modal verbs making offers: will/shall/should		
			4th Stage: Using going to make prediction		
March 2	1		1st Stage: Teaching countable and uncountable	Lecture	Oral Test
			2nd Stage: Practicing /s'/ plural		
			3rd Stage: Introduction to future forms		
			4th Stage: Using will/going to for make decisions and intentions		
March	1		1st Stage:		

3			Teaching the determiner the 2nd Stage: How to indicate time 3rd Stage: Introduction to present continuous in using will/going to 4th Stage: using will and shall	Lecture	Discussion and exam
March 4	1		1st Stage: Teach the determiners a/an 2nd Stage: Negative short answers 3rd Stage: Using will/going to 4th Stage: Introduction to express quantities	Lecture	Discussion and exam
April 1	1		1st Stage: Teaching prepositions 2nd Stage: Using some/any, each /every, more/most 3rd Stage: Introduction to like 4th Stage: Introduction to modal verbs	Lecture	Discussion and exam
April 2	1		1st Stage: Teaching numbers 2nd Stage: How to indicate place 3rd Stage: The use of relative clauses 4th Stage: Other uses to model verbs and related verbs	Lecture	Discussion and exam
April 3	1		1st Stage: Teaching collars 2nd Stage: Teach jobs 3rd Stage: The use of time clauses 4th Stage: Introduction relative clauses	Lecture	Discussion and exam
April 4	1		1st Stage: Teaching question words		

			2nd Stage: Teach plural pronouns 3rd Stage: The use of If conditions 4th Stage: Expressing habits	Lecture	Discussion and exam
May 1	1		Revision for all the Stages	Lecture	Discussion and exam
May 2	1		Revision for all the Stages	Lecture	Discussion and exam
May 3&4	-------		Final Exams	---------- ---	----------

11. Course Evaluation

First Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Second Course:
Monthly Exam: 20
Daily homework: 5
Total: 25
Total for the 1st and 2nd Courses: 50
Final Exam: 50
Final Grade: 100

12. Learning and Teaching Sources

Required textbooks (curricular books, if any)	The Ministry's prescribed book for all the stages
Main references (sources)	----------
Recommended books and references (scientific journal, reports	
Electronic References, Websites	https://elt.oup.com/student/headway/beg/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/preint4/?cc=global&selLanguage=en. https://elt.oup.com/student/headway/int/?cc=global&selLanguage=en. https://sc.nahrainuniv.edu.iq/lectures/7092_new-headway-upper-intermediate-students-book.pdf.

Course Description Form

1. Course Name:	
Analytical Chemistry Laboratory / First Stage	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr.Yasameen Mutashar Khudhur Email:ykhather@tu.edu.iq	
8. Course Objectives	
Course Objectives	**1-** Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. **2-** Encouraging students to acquire knowledge and information, and the ability to conclude. **3-** Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure				
week	Hours	Unit/Topic Name	Learning Method	Assessment Method
October 1	2	Lab Orientation and Safety Protocols	Scientific Method	Lab Reports and Daily Quizzes
October 2	2	Training on Handling Chemical Glassware and Equipment	Scientific Method	Lab Reports and Daily Quizzes
October 3	2	Analysis of Group I cations	Scientific Method	Lab Reports and Daily Quizzes
October 4	2	Analysis of Group II A cations	Scientific Method	Lab Reports and Daily Quizzes
November 1	2	Analysis of Group II B cations	Scientific Method	Lab Reports and Daily Quizzes
November 2	2	Analysis of Group III A and B cations	Scientific Method	Lab Reports and Daily Quizzes
November 3	2	Analysis of Group IV cations	Scientific Method	Lab Reports and Daily Quizzes
November 4	2	Analysis of Group V cations	Scientific Method	Lab Reports and Daily Quizzes
December 1	2	Experiments in the detection of some anions	Scientific Method	Lab Reports and Daily Quizzes
December 2	2	Methods of using instruments in volumetric titrations	Scientific Method	Lab Reports and Daily Quizzes
December 3	2	Preparation of 0.1 N hydrochloric acid solution and its standardization	Scientific Method	Lab Reports and Daily Quizzes

December 4	2	Preparation of 0.1 N sodium hydroxide solution and its standardization	Scientific Method	Lab Reports and Daily Quizzes
January 1	2	Determination of acetic acid and analysis of commercial vinegar	Scientific Method	Lab Reports and Daily Quizzes
January 2	2	Determination of sodium carbonate and sodium hydroxide	Scientific Method	Lab Reports and Daily Quizzes
January 3	2	Determination of chloride by Mohr's method and its application to the purity of table salt	Scientific Method	Lab Reports and Daily Quizzes
January 4	2	Determination of chloride by Volhard's method and its application to the purity of table salt	Scientific Method	Lab Reports and Daily Quizzes
February 1	2	First Semester Exam	Scientific Method	Lab Reports and Daily Quizzes
February 2	2	Preparation of potassium permanganate and determination of its concentration by titration with oxalate.	Scientific Method	Lab Reports and Daily Quizzes
March 1	2	Determination of iron by titration with potassium permanganate	Scientific Method	Lab Reports and Daily Quizzes

March 2	2	Determination of iron by titration with potassium dichromate	Scientific Method	Lab Reports and Daily Quizzes
March3	2	Determination of zinc by titration with EDTA	Scientific Method	Lab Reports and Daily Quizzes
March 4	2	Determination of calcium and magnesium in water by titration with EDTA	Scientific Method	Lab Reports and Daily Quizzes
April1	2	Determination of available chlorine in bleaching powder	Scientific Method	Lab Reports and Daily Quizzes
April2	2	Determination of Vitamin C in orange juice	Scientific Method	Lab Reports and Daily Quizzes
April3	2	Determination of silver in coins	Scientific Method	Lab Reports and Daily Quizzes
April4	2	Sconed Semester Exam		
May 1	2	General Review	Scientific Method	Lab Reports and Daily Quizzes

11. Course Assessment

- **Formative Assessment**: This includes daily exams, observing student performance in class discussions and homework assignments, and overall classroom assessment. This accounts for a maximum of 20% of the total grade.
- **Diagnostic Assessment**: This is conducted through midterm and final exams to determine pass/fail status, accounting for 20% of the grade. It is divided into four midterm exams throughout the year, plus two practical exams (one for each semester) to calculate the annual score before the final exams.

12. Learning and Teaching Resources

Required Textbooks (if available)	• Foundations of Analytical Chemistry, by Dr. Muayed Qasim Al-Abayji and Dr. Thabit Said Al-Ghabsha, University of Mosul, 1983. • Analytical Chemistry: Separation Methods, by Dr. Samir Abdul Rahim Said and Dr. Thabit Said Al-Ghabsha, University of Mosul, 1985.
Main References (sources):	• Analytical Chemistry, by Gary Christian, Sixth Edition. • Chemical Analysis: Modern Instrumentation Methods and Techniques, by Francis Rouessac and Annick Rouessac, Second Edition. • Modern Analytical Chemistry, by David Harvey.
Recommended Supporting Books and References (scientific journals, reports, etc.):	http://www.chemicalprocessing.com
Electronic References and Websites:	http://www.bytoco.com

Course Description Form

1. Course Name:	
Analytical Chemistry Laboratory / Second Stage	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr.Yasameen Mutashar Khudhur Email:ykhather@tu.edu.iq	
8. Course Objectives	
Course Objectives	**1-** Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. **2-** Encouraging students to acquire knowledge and information, and the ability to conclude. **3-** Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure				
week	Hours	Unit/Topic Name	Learning Method	Assessment Method
October 1	2	Lab Orientation and Safety Protocols	Scientific Method	Lab Reports and Daily Quizzes
October 2	2	Training on Handling Chemical Glassware and Equipment	Scientific Method	Lab Reports and Daily Quizzes
October 3	2	Introduction of gravimetric analysis	Scientific Method	Lab Reports and Daily Quizzes
October 4		Determination of water of crystallization in hydrated barium chloride	Scientific Method	Lab Reports and Daily Quizzes
November 1	2	Estimation of chloride as silver chloride	Scientific Method	Lab Reports and Daily Quizzes
November 2	2	Estimation of sulfate as barium sulfate	Scientific Method	Lab Reports and Daily Quizzes
November 3	2	Estimation of calcium as calcium oxalate	Scientific Method	Lab Reports and Daily Quizzes
November 4	2	Estimation of calcium as calcium carbonate	Scientific Method	Lab Reports and Daily Quizzes
December 1	2	Estimation of calcium as calcium oxide	Scientific Method	Lab Reports and Daily Quizzes
December 2	2	Estimation of iron as ferric oxide	Scientific Method	Lab Reports and Daily Quizzes
December 3	2	Estimation of aluminum as aluminum oxide	Scientific Method	Lab Reports and Daily Quizzes

December 4	2	Estimation of nickel as nickel dimethylglyoxime complex	Scientific Method	Lab Reports and Daily Quizzes
January 1	2	Estimation of sulfate by precipitation from homogeneous solution (PFHS).	Scientific Method	Lab Reports and Daily Quizzes
January 2	2	Precipitation of aluminum as its oxide by precipitation from a homogeneous solution	Scientific Method	Lab Reports and Daily Quizzes
January 3	2	First Semester Exam	Scientific Method	Lab Reports and Daily Quizzes
January 4	2	Introduction to the Separation Method		Lab Reports and Daily Quizzes
February 1	2	Distribution of iodine between an organic solvent and water	Scientific Method	Lab Reports and Daily Quizzes
February 2	2	Distribution of ammonia between an organic solvent and water.	Scientific Method	Lab Reports and Daily Quizzes
March 1	2	Repetitive extraction of iodine	Scientific Method	Lab Reports and Daily Quizzes
March 2	2	Calculation of cation exchange capacity (CEC)	Scientific Method	Lab Reports and Daily Quizzes

March3	2	Separation of a mixture of silver (I), mercury (I), and lead (II) ions using paper chromatography.	Scientific Method	Lab Reports and Daily Quizzes
March 4	2	Separation of a mixture of indicator dyes by paper chromatography	Scientific Method	Lab Reports and Daily Quizzes
April1	2	Separation of a mixture of amino acids using paper chromatography	Scientific Method	Lab Reports and Daily Quizzes
April2	2	Separation of a mixture of permanganate and dichromate by column chromatography.	Scientific Method	Lab Reports and Daily Quizzes
April3	2	Sconed Semester Exam	Scientific Method	Lab Reports and Daily Quizzes
April4	2	General Review	Scientific Method	Lab Reports and Daily Quizzes

11. Course Assessment

- **Formative Assessment**: This includes daily exams, observing student performance in class discussions and homework assignments, and overall classroom assessment. This accounts for a maximum of 20% of the total grade.
- **Diagnostic Assessment**: This is conducted through midterm and final exams to determine pass/fail status, accounting for 80% of the grade. It is divided into four midterm exams throughout the year, plus two practical exams (one for each semester) to calculate the annual score before the final exams.

12. Learning and Teaching Resources

Required Textbooks (if available)	• Foundations of Analytical Chemistry, by Dr. Muayed Qasim Al-Abayji and Dr. Thabit Said Al-Ghabsha, University of Mosul, 1983. • Analytical Chemistry: Separation Methods, by Dr. Samir Abdul Rahim Said and Dr. Thabit Said Al-Ghabsha, University of Mosul, 1985.
Main References (sources):	• Analytical Chemistry, by Gary Christian, Sixth Edition. • Chemical Analysis: Modern Instrumentation Methods and Techniques, by Francis Rouessac and Annick Rouessac, Second Edition. • Modern Analytical Chemistry, by David Harvey.
Recommended Supporting Books and References (scientific journals, reports, etc.):	http://www.chemicalprocessing.com
Electronic References and Websites:	http://www.bytoco.com

Course Description Form

1. Course Name:	
Instrumental Analysis - Practical (4th Stage)	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr.Yasameen Mutashar Khudhur Email:ykhather@tu.edu.iq	
8. Course Objectives	
Course Objectives	**1-** Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. **2-** Encouraging students to acquire knowledge and information, and the ability to conclude. **3-** Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure				
week	Hours	Unit/Topic Name	Learning Method	Assessment Method
October 1	3	Beer-Lambert Law	Scientific Method	Lab Reports and Daily Quizzes
October 2	3	Spectrophotometric determination of iron with thiocyanate	Scientific Method	Lab Reports and Daily Quizzes
October 3	3	Spectrophotometric determination of nitrite using diazotization and coupling reactions	Scientific Method	Lab Reports and Daily Quizzes
October 4	3	Spectrophotometric determination of manganese by oxidation with potassium periodate.	Scientific Method	Lab Reports and Daily Quizzes
November 1	3	Spectrophotometric determination of ferrous iron using 1,10-phenanthroline reagent and finding precision and accuracy.	Scientific Method	Lab Reports and Daily Quizzes
November 2	3	Spectrophotometric determination of glycine using chloranil and finding the nature of the complex and its stability constant	Scientific Method	Lab Reports and Daily Quizzes
November 3	3	Determination of benzoic acid by photometric titration	Scientific Method	Lab Reports and Daily Quizzes

November 4	3	Determination of zinc by photometric titration with EDTA.	Scientific Method	Lab Reports and Daily Quizzes
December 1	3	. First Semester Exam	Scientific Method	Lab Reports and Daily Quizzes
December 2	3	Determination of sulfates by nephelometry	Scientific Method	Lab Reports and Daily Quizzes
December 3	3	Determination of sodium and potassium using the flame emission technique	Scientific Method	Lab Reports and Daily Quizzes
December 4	3	Determination of lead and copper using atomic absorption spectrophotometry	Scientific Method	Lab Reports and Daily Quizzes
January 1	3	Spectrophotometric determination of phosphate using molybdate reactions.	Scientific Method	Lab Reports and Daily Quizzes
January 2	3	Spectrophotometric determination of lead in plant leaves using organic reagents and solvent extraction.	Scientific Method	Lab Reports and Daily Quizzes
January 3	3	Determination of a mixture of hydrochloric and phosphoric acids by potentiometric titrations.	Scientific Method	Lab Reports and Daily Quizzes

January 4	3	Determination of iodide by potentiometric titrations	Scientific Method	Lab Reports and Daily Quizzes
February 1	3	Determination of Vitamin C in pharmaceutical tablets using the polarography technique	Scientific Method	Lab Reports and Daily Quizzes
February 2	3	. Determination of a mixture of hydrochloric and acetic acids by conductometric titration	Scientific Method	Lab Reports and Daily Quizzes
April3	3	. Determination of inorganic phosphorus in blood serum or urine by spectrophotometry.	Scientific Method	Lab Reports and Daily Quizzes
April3	3	Polarographic estimation of trace amounts of metals: Cd, Zn 2+ , Pb.	Scientific Method	Lab Reports and Daily Quizzes
April4	3	Sconed Semester Exam		
May 1	3	General Review		

11. Course Assessment

- **Formative Assessment**: This includes daily exams, observing student performance in class discussions and homework assignments, and overall classroom assessment. This accounts for a maximum of 20% of the total grade.
- **Diagnostic Assessment**: This is conducted through midterm and final exams to determine pass/fail status, accounting for 80% of the grade. It is divided into four midterm exams throughout the year, plus two practical exams (one for each semester) to calculate the annual score before the final exams.

12. Learning and Teaching Resources

Required Textbooks (if available)	• Foundations of Analytical Chemistry, by Dr. Muayed Qasim Al-Abayji and Dr. Thabit Said Al-Ghabsha, University of Mosul, 1983. • Analytical Chemistry: Separation Methods, by Dr. Samir Abdul Rahim Said and Dr. Thabit Said Al-Ghabsha, University of Mosul, 1985.
Main References (sources):	• Analytical Chemistry, by Gary Christian, Sixth Edition. • Chemical Analysis: Modern Instrumentation Methods and Techniques, by Francis Rouessac and Annick Rouessac, Second Edition. • Modern Analytical Chemistry, by David Harvey.
Recommended Supporting Books and References (scientific journals, reports, etc.):	http://www.chemicalprocessing.com
Electronic References and Websites:	http://www.bytoco.com

Course Description Form

1. Course Name:
Practical inorganic chemistry
2. Course Code:
3. Semester / Year:
2025-2026
4. Description Preparation Date:
18/9 /2025
5. Available Attendance Forms:
Direct attendance in classrooms
6. Number of Credit Hours (Total) / Number of Units (Total)
8 practical hours / 4 units
7. Course administrator's name (mention all, if more than one name)
Name: **Assistant lecturer Noor Abdul Salam Mohammed** Email: nmohammed@tu.edu.iq
8. Course Objectives

Course Objectives	•
1- Providing students with general information for industrial chemistry 2- Introducing students to methods of preparing soap 3- Explaining to students how to deal with chemicals and tools in the laboratory 4- An explanation to students about how to prepare solid and liquid solutions 5- Introducing students to the correction process and how it is performed in the laboratory	•
	•

9. Teaching and Learning Strategies	
Strategy	1-Providing students with general information about inorganic and coordination chemistry. 2- Introducing students to methods of expressing concentrations and giving laws. 3-Explaining to students how to deal with chemicals and tools in the laboratory 4-. Explaining to students how to prepare solid and liquid solutions 5- Introducing students to how to measure melting and boiling points and recrystallization

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
30weeks	90 hours		Knowledge of chemical elements Knowledge of dealing with laboratory materials and tools Study of the elements of the periodic table and its divisions		examinations

11 Course Evaluation	
Distributing the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly and written exams, reports, etc.	
.12Learning and Teaching Resources	
Fundamentals of coordination chemistry by Mohamed Magdy Wasil	Required textbooks (methodology if available(
	Main References (Sources(
	Recommended supporting books and references (scientific journals, reports
	Electronic references, Internet sites

Course Description Form

1. Course Name:	
Coordinated Chemistry Laboratory / Third Stage	
2. Course Code	
3. Semester / Year	
Annual	
4. Description Preparation Date:	
18/9/2025	
5. Available Attendance Forms:	
Face-to-face lectures and online classes (Classroom)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours / 7 units	
7. Course administrator's name (mention all, if more than one name)	
Name: **Assistant lecturer Noor Abdul Salam Mohammed** Email: nmohammed@tu.edu.iq	
8. Course Objectives	
Course Objectives	**1-** Developing students' ability to follow and understand the discourse and enhance their ability to distinguish between main and secondary ideas. **2-** Encouraging students to acquire knowledge and information and the ability to draw conclusions. **3-** Developing their abilities to create quick and comprehensive summaries of the topic.
9-Teaching and Learning Strategies	
A strategy can be defined as a set of general rules and guidelines that focus on the means of achieving the desired teaching objectives and refer to the methods and plans followed by faculty members to achieve learning goals.	

10- Course Structure

Week	Hours	Required learning outcomes	Unit or topic name	Learning method	Evaluation method
October 1	3	Presentation method Discussion method	Transitional elements	Standard method, practical method	Grades and exams
October 2	3	Presentation method Discussion method	Complex preparation Hexaammine nickel (II) chloride	Standard method, practical method	Grades and exams
October 3	3	Presentation method Discussion method	Complex preparation Tetraamminecupper (II) sulphate hydrate	Standard method, practical method	Grades and exams
October 4	3	Presentation method Discussion method	Complex preparation Bis – dimethyl glyoximato nickel(II)	Standard method, practical method	Grades and exams
November1	3	Presentation method Discussion method	Complex preparation (Diiodatocupper(II	Standard method, practical method	Grades and exams
November2	3	Presentation method Discussion method	Complex preparation Cis-Potassium diaquadioxalatochromate(III) hydrate	Standard method, practical method	Grades and exams
November3	3	Presentation method Discussion method	Complex preparation Trans-Potassium diaquadioxalatochromate(III) hydrate	Standard method, practical method	Grades and exams
November4	3	Presentation method Discussion method	Complex preparation Cis-Potassium diaquadioxalatochromate(III) hydrate	Standard method, practical method	Grades and exams
December1	3	Presentation method Discussion method	Complex preparation Trans-Potassium diaquadioxalatochromate(III) hydrate	Standard method, practical method	Grades and exams
December 2	3	Presentation method Discussion method	Complex preparation Pot. Trioxalatoaluminate (III) hydrate	Standard method, practical method	Grades and exams
December 3	3	Presentation method Discussion method	Hard acids and soft acids	Standard method, practical method	Grades and exams

December 4	**3**	**Presentation method Discussion method**	**Complex preparation Tri thioureacupper(I) sulphate hydrate**	**Standard method, practical method**	**Grades and exams**
January 1	**3**	**Presentation method Discussion method**	**Complex preparation Pentathioureadicupper(I) nitrate**	**Standard method, practical method Standard method, practical method**	**Grades and exams**
January 2	**3**	**Presentation method Discussion method**	**Complex preparation Potassium trioxalatoferrale(III) Hydrate**	**Standard method, practical method**	**Grades and exams**
January 3	**3**	**Presentation method Discussion method**	**Complex preparation Hexaamminecobalt (III) chloride**	**Standard method, practical method**	**Grades and exams**
January 4	**3**		**First semester exam**		
February 1	**3**	**Presentation method Discussion method**	**Complex preparation Pentaamminechloridocobalt(III) chloride**	**Standard method, practical method**	**Grades and exams**
February 2	**3**	**Presentation method Discussion method**	**Complex preparation Penta nitrito ammine cobalt(III) chloride**	**Standard method, practical method**	**Grades and exams**
March 1	**3**	**Presentation method Discussion method**	**Complex preparation Pentaamminenitro cobalt(III) chloride**	**Standard method, practical method**	**Grades and exams**
March 2	**3**	**Presentation method Discussion method**	**Pentaamminenitrato cobalt(III) nitrate**	**Standard method, practical method**	**Grades and exams**
March 3	**3**	**Presentation method Discussion method**	**Complex preparation Potassium hexaisothiocyanatochromate(III) hydrate**	**Standard method, practical method**	**Grades and exams**
March 4	**3**	**Presentation method Discussion method**	**Complex preparation Trithioureacupper(I) chloride**	**Standard method, practical method**	**Grades and exams**
April 1	**3**	**Presentation method Discussion method**	**Complex preparation Trithioureacupper(I) chloride**	**Standard method, practical method**	**Grades and exams**
April 2	**3**	**Presentation method Discussion method**	**Cupper Complex trans–potassium dioxalatocupper(I) hydrate**	**Standard method, practical method**	**Grades and exams**

April 3	**3**	**Presentation method Discussion method**	**Complex preparation Bis glycinatocupper(I) hydrate**	**Standard method, practical method**	**Grades and exams**
April 4	**3**	**Presentation method Discussion method**	**Complex preparation Bis-ethylenediaminecupper(II) nitrate**	**Standard method, practical method**	**Grades and exams**
May 1	**3**	**Presentation method Discussion method**	**Complex preparation Bis – acetylacetonatodiaquacobalt(II)**	**Standard method, practical method**	**Grades and exams**
May 2	**3**	**Presentation method Discussion method**	**Complex preparation Pentaamminethiosulphatocobalt(III) chloride**	**Standard method, practical method**	**Grades and exams**
May 3			**Second semester exam**		
May 4			**General review**	**Problem-solving method**	
May 15			**Final exams**		

11. Course Evaluation	
Distribution of grades out of 100 according to tasks assigned to the student such as daily attendance, daily and monthly exams, reports, etc.	
12. Learning and Teaching Resources	
Required textbooks (methodology if available)	Chemistry of Transition Elements / Chemistry Department
Main references (sources)	**1-** Chemistry of Transition Elements - Coordination Principles (Dr. Naaman Al Nuaimi) **2-** Coordination Chemistry (Translated by Dalal Ajam and Dr. Ali Hassoun Al Tayyar) **3-** Chemistry of Transition Elements (Dr. Mahdi Naji Al Zakum)
Recommended supplementary books and references (scientific journals, reports...)	
Electronic references, internet sites	

Course description form

1. Course name
Teaching thinking
2. Course code
The fourth stage
3. Semester/year
2025/2026
4. The date this description was prepared
18/9/2025
5. Available forms of attendance
Teaching in person with the creation of an electronic class via the Google Classroom platform, which will be a supporting class for the in-person class, and the access code for the electronic class is (kfwwnn7) according to the controls and instructions of the Ministry of Higher Education and Scientific Research.
6. Number of study hours (total) / number of units (total)
60 hours / 2 units
7. Name of the course administrator (if more than one name is mentioned): None
Name: M. Noor Firas Abd al kareem Email: noor.firas@tu.edu.iq
.8Course objectives

- 1The student's awareness of the importance of teaching thinking - 2The student's familiarity with the stages of teaching thinking .-3Enabling the student to achieve general educational goals. - 4Empowering the student and creating opportunities for him to learn to think and learn. -5Avoiding the student from making thinking mistakes after learning about them.	**Objectives of the study subject**

- 6The student gets to know thinking teaching programs and how to apply them. - 7Providing the student with basic and higher thinking skills.	

9. Teaching and learning strategies

The student's book,

and the most important means available are the blackboard,

colored pencils,

dialogue and discussion,

and some classroom activities

.10Course structure

Evaluation method	Teaching method	Name of the unit/topic	Required learning outcomes	hours	**the week**
Monthly, quarterly and final achievement tests	Lecture, discussion and questioning	The historical genesis of thinking	Bachelor's degree in educational and psychological sciences	2	**the first**
=	=	Thinking and Islam, thinking and intelligence	=	2	**the second**
=	=	Components of teaching thinking	=	2	**the third**
=	=	Teaching thinking jobs	=	2	**the fourth**
=	=	Steps to teach thinking. Mistakes in teaching thinking	=	2	**Fifth**
=	=	Trends in teaching thinking	=	2	**Sixth**
Written exam	=	Semester exam	=	2	**Seventh**
=	=	Thinking patterns and skills	=	2	**eight**
=	=	Thinking education programmes	=	2	**Ninth**

=	=	Critical thinking	=	2	**The tenth**
=	=	critical thinking skills	=	2	**eleventh**
=	=	The relationship of critical thinking to other types of thinking	=	2	**twelveth**
=	=	Experiences of some countries in the field of critical thinking	=	2	**Thirteenth**
=	=	The role of the teacher in teaching thinking	=	2	**fourteenth**
=	=	Creative thinking	=	2	**Fifteenth**
=	=	Justifications for teaching creative thinking	=	2	**sixteen**
=	=	Creative thinking skills	=	2	**seventeenth**
=	=	Problem Solving	=	2	**eighteen**
=	=	Components of problem solving and their types	=	2	**nineteenth**
=	=	Factors that contribute to solving the problem	=	2	**The twentieth week**
=	=	Coupled thinking	=	2	**twenty one**
=	=	Negative thinking	=	2	**twenty tow**
=	=	Analytical thinking	=	2	**twenty third**
=	=	Post-formal thinking	=	2	**twenty fourth**
=	=	Positive thinking	=	2	**Twenty-fifth**
=	=	Hierarchical complexity model	=	2	**twenty-sixth**
=	=	Habits of mind	=	2	**Twenty-seventh**
=	=	Theories of mind	=	2	**Twenty-eighth**

=	=	Higher order thinking	=	2	**twenty-ninth**
=	=	Second semester exam	=	2	**thirty**

.11Course evaluation	
Distribution of the grade out of 100 according to the tasks assigned to the student, such as daily preparation, daily, oral, monthly, written exams, reports, etc. **Written test** **Assignment and class activities** **- Assignments and applications at the end of each stage.** **- Discussions with students.** **First semester exam of 15 marks (and 5 marks for report and participation by the female students) (5 marks for daily attendance)** **Second semester exam of 15 marks (5 marks for class participation and interaction) (5 marks for daily attendance)** **A final exam of 50 marks, and the final total equals 100 marks.**	
.12Learning and teaching resources	
Teaching thinking	**Required textbooks (methodology, if any)**
Al-Obaidi, Sabah Marshoud Manukh, Al-Barzanji, Laila Ali (2017): Teaching Thinking, Modern Book Foundation, Lebanon.	**Main references (sources)**
1: Scientific journals, periodicals, research and studies in the field of specialization.	**Recommended supporting books and references (scientific journals, reports...)**
noor-book.com/vxb7eq https://books4arabs.com/BORE02-2/BORE02-2542.pdf	**Electronic references, Internet sites**

Course Description Form

1. Course Name:
Mathematics
2. Course Code:
Math
3. Semester / Year:
2025-2026
4. Description Preparation Date:
2025/9/18
5. Available Attendance Forms:
Classroom and Google classroom
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours
7. Course administrator's name (mention all, if more than one name)
Name Astbrq Ismeel Fadhil Emil : astbrq.fadhil@tu.edu.iq

8. Course Objectives	
Course Objectives	• To learn the basic concepts of calculus. • Understanding the connection between functions and their relationship to limits. • Identifying the differentiability of functions and their relationship to continuity. • Knowledge of the applications of differential and integral calculus in various sciences. •The ability to use differential and integral calculus in solving mathematical problems.

9. Teaching and Learning Strategies	
Strategy	• Use explanations and illustrations to present concepts. • Interact with students through discussions and practical exercises. • Use real-world examples and applications to clarify mathematical concepts.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-4	4 hours	Using General Law to solve the Equations	Definition Using General Law to solve the Equationsand exams	theoretical	exam, reports
5-8	4 hours	Graphing Function	Functions, function composition, graphing functions	theoretical	General questions and discussion.
9-12	4 hours	Partial Derivativer	Definition of partial derivativers and exams	Theoretical	Report, Exams and discussions
13-16	4 hours	Derivation	Definition of derivatives and related theories	. Theoretical	Report, Exams .
17-20	4 hours	The Definite Integral	Properties of definite Integrals	Theoretical	General questions and discussion with reports.
21-27	8 hours	The sequence and function	Definition of arithmetic and gyeguometric sequences	Theoretical	General questions and discussion with reports.
28-31	4 hours	integration	Definition of definite and indefinite integrals and their applications	. Theoretical	Exams and discussions

11. Course Evaluation

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

12.Learning and teaching resources

Required textbooks (methodology, if applicable) : Thomas. G.B, Calculus and Analytic Geomatry, 4th , 1984.

Main references (sources): Khaled Ahmed Al-Samarrai: Differential and Integral Calculus.

Course description template

Course Name .1	
General Arabic, Life Sciences Department	
Course Code .2	
Term/Year .3	
Annual course	
Date this description was prepared .4	
2025/9/18	
Available attendance formats .5	
, which ROOMCIASS person classroom lectures + an online classroom on -In : serves as a supplementary classroom https://classroom.google.com/c/Njg3NDQ1MzU4NDk2?cjc=bcslldr	
Total number of study hours / Total number of units .6	
60	
Name of the course coordinator (if there is more than one, mention it) .7	
Afrah.Abass@tu.edu.iq: Name: M.M. Afrah Abbas Maher Email	
Course Objectives .8	
Course objectives	A1- The student should be able to master the rules of Arabic grammar, morphology, spelling, and expression by understanding the morphological scale, distinguishing between types of plurals, parts of speech, and inflectional endings, and recognizing verb conjugation. A2- The student should be able to apply language skills by distinguishing between letters of the alphabet, mastering diacritical marks and the rules for writing the hamza, and reducing common linguistic errors. A3- The student should be able to understand Arabic literature through poetic examples,

develop literary taste, and understand and analyze .the text A4- To enable the student to develop the ability to read the Qur'anic text correctly and understand the general meaning of the verses and hadiths A5- The student should become familiar with Arabic dictionaries by learning how to search for them and understanding the meanings of .unfamiliar words in the Holy Quran A6- The student should be able to perceive the rhetorical beauty in texts	

Teaching and learning strategies .9

	strategy

Course Structure .10

Evaluation Method	Learning method	Unit or topic name	Required learning outcomes	Hours	Week
Classroom performance and exams	**Lecture**	**Introducing students to Surah Al-Hajj and its interpretation**	**Mental and cognitive skills**	**2**	**November 2**
Classroom performance and exams	**Lecture**	**The noble Prophetic Hadith: "I was sent only to perfect ".good morals**	**Mental and cognitive skills**	**2**	**November 3**
Classroom performance and exams	**Lecture**	**A poem by Antarah ibn Shaddad**	**Mental and cognitive skills**	**2**	**November 4**
Classroom performance and exams	**Lecture**	**Morphological balance**	**Mental and cognitive skills**	**2**	**December 1**
Classroom performance and exams	**Lecture**	**Verb conjugation in terms of ,soundness ,weakness ,detachment and augmentation**	**Mental and cognitive skills**	**2**	**December 2**

Classroom performance and exams	**Lecture**	**Attributing the verb to pronouns**	**Mental and cognitive skills**	**2**	December 3
Classroom performance and exams	**Lecture**	**Plurals in Arabic**	**Mental and cognitive skills**	**2**	**December 4**
Classroom performance and exams	**Lecture**	**Derivatives in the Arabic language**	**Mental and cognitive skills**	**2**	**January 1**
Classroom performance and exams	**Lecture**	**Solar and lunar alphabets**	**Mental and cognitive skills**	**2**	**January 2**
Classroom performance and exams	**Lecture**	**Punctuation marks in Arabic writing**	**Mental and cognitive skills**	**2**	**January 3**
Classroom performance and exams	**Lecture**	**Rules for writing the hamza**	**Mental and cognitive skills**	**2**	**January 4**
Classroom performance and exams	**Lecture**	**Arabic dictionaries**	**Mental and cognitive skills**	**2**	**February 1**
classroom performance	**Lecture**	**,The defective , shortened and lengthened noun, its dual and plural forms**	**Mental and cognitive skills**	**2**	**February 2**
Classroom performance and exams	**Lecture**	**The sound verb - the weak verb**	**Mental and cognitive skills**	**2**	**February 3**
Classroom performance and exams	**Lecture**		**Mental and cognitive skills**	**2**	**February 4**
Mid-year break starts and3/1 on on 3/8 ends					**March 1**
Classroom performance and exams	**Lecture**	**Surah Al-Baqarah 260-263**	**Mental and cognitive skills**	**2**	**March 3**

Classroom performance and exams	Lecture	The noble Prophetic Hadith: “The best among you are those who learn the Qur’an and ”.teach it	Mental and cognitive skills	2	March 4
Classroom performance and exams	Lecture	Ibn al-Rumi's poem	Mental and cognitive skills	2	April 1
Classroom performance and exams	Lecture	Human values in Arabic poetry	Mental and cognitive skills	2	April 2
Classroom performance and exams	Lecture	Seven verses from the poem Peace be" ,upon the tall "slender ones by Al-Jawahiri	Mental and cognitive skills	2	Nissan3
Classroom performance and exams	Lecture	Parts of Speech	Mental and cognitive skills	2	April 4
Classroom performance and exams	Lecture	Inflected and ,indeclinable definite and indefinite	Mental and cognitive skills	2	May 1
Classroom performance and exams	Lecture	Subject and predicate	Mental and cognitive skills	2	May 2
Classroom performance and exams	Lecture	The abrogating agents	Mental and cognitive skills	2	May 3
Classroom performance and exams	Lecture	The noun in terms of gender masculine) (and feminine	skills mentality and cognitive	2	May 4
Classroom performance and exams	Lecture	The name in terms of abstraction and augmentation	skills mentality and cognitive	2	June 1

classroom performance	**Lecture**	**Arabic dictionaries the) methodology ,of my school Al-Thaqafiya ,and Al-Sahah and exercises on extracting (words**	**skills mentality and cognitive**	**2**	**2 June**
classroom performance	**Lecture**	**Arabic rhetoric (the science of figures of speech and its impact on the eloquence of (speech**	**and cognitive skills**	**2**	**3 June**
6/26 Starts	**Final exams**				**4 June**

Course Evaluation .11	
,The grade out of 100 is distributed according to the tasks assigned to the student .such as daily preparation, daily, oral, monthly, and written exams, reports, etc	
Learning and teaching resources .12	
General Arabic for Non- Specialized Sections: Sabah Ali Suleiman	Required textbooks (methodology, if (applicable
General Arabic for Non-Specialized Departments (Tikrit University - Habib Ahmed Al-Azzawi) - General Arabic for Non-Specialized Departments : Amin Abdul Qadir Hassan	Main references (sources)
	Recommended supporting books and references (scientific journals, reports...)
Our Arabic Library Forums -	Electronic references, websites

Course Description Form

1. Course Name:
Guidance is a third stage for non-specialists
2. Course Code:
Guidance is a third stage for non-specialists
3. Semester / Year:
Annual course
4. Description Preparation Date:
18/9/2025
5. Available Attendance Forms:
Attending a class + an electronic class on GoogleClassroom will be a supporting class for the in-person class and a link to Ikmahvq according to the thinking regulations of the Ministry of Higher Education and Scientific Education.
6. Number of Credit Hours (Total) / Number of Units (Total)
/60 hours Number of weekly units 2
7. Course administrator's name (mention all, if more than one name)
Name: M. Liqaa Mohamd Salih Mar Email: LiqaaSalih@tu.edu.iq
8. Course Objectives

Course Objectives	The curriculum aims to prepare students to practice the teaching profession by learning about: -1Learn about educational psychology, style, motivation, and sensory perception. -2Learn about the types of educational psychology. -3How to formulate behavioral goals. - 4Knowledge of educational schools. 5 - The importance of educational applications of learning theories..
9. Teaching and Learning Strategies	
Strategy	The standard method (giving lectures). 1 - Lecture method. 2 - The method of discussion and interrogation. 3- Brainstorming method.

10. Course Structure		The study began on 11/1/2023 and ends on 5/19/2024, the start date of final exams.			
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	The student's understanding of the lesson	Guidance	Discussion and questioning	Class performance and exams
2	2	The student's understanding of the lesson	Meaning of educational guidance	Discussion and questioning	Class performance and exams
3	2	The student's understanding of the lesson	The origins of guidance	Psychological storming	Class performance and exams
4	2	The student's understanding of the lesson	The development of counseling and its concepts	Discussion and questioning	Class performance and exams
5	2	The student's understanding of the lesson		Discussion and questioning	Class performance and exams
6	2	The student's understanding of the lesson		Discussion and questioning	Class performance and exams
7	2	The student's understanding of the lesson	The difference between guidance and guidance	Discussion and questioning	Class performance and exams
8	2	The student's understanding of the lesson	Justifications for guidance and its objectives	Discussion and questioning	Class performance and exams
9	2	The student's understanding of the lesson	Principles of guidance and direction	Problem Solving	Class performance and exams
10	2	The student's understanding of the lesson	The relationship between counseling and other sciences,	Discussion and questioning	Class performance and exams
11	2	The student's understanding of the lesson	Counseling areas	Discussion and questioning	Class performance and exams
12	2	The student's understanding of the lesson	Guidance methods (individual and group counselling).	Discussion and questioning	Class performance and exams
13	2	The student's understanding of the lesson	Guidance problems addressed by educational guidance	Discussion and questioning	Class performance and exams
14	2	The student's understanding of the lesson		Discussion and questioning	Class performance and exams
15	2	The student's understanding	Introduction to the foundations of counseling	Discussion and questioning	Class performance and exams

		of the lesson			
16	2	The student's understanding of the lesson	Philosophical foundations	Discussion and questioning	Class performance and exams
17	2	The student's understanding of the lesson	Social foundations	Discussion and questioning	Class performance and exams
18	2	The student's understanding of the lesson	Congenital foundations	Discussion and questioning	Class performance and exams
19	2	The student's understanding of the lesson	Psychological foundations	Discussion and questioning	Class performance and exams
20	2	The student's understanding of the lesson	Counseling theories, psychoanalytic theory	Discussion and questioning	Class performance and exams
21	2	The student's understanding of the lesson	Behavioral theory	Discussion and questioning	Class performance and exams
22 2	2	The student's understanding of the lesson	Self theory	Discussion and questioning	Class performance and exams
23	2	The student's understanding of the lesson	Existential and humanistic theory	Discussion and questioning	Class performance and exams
24	2	The student's understanding of the lesson	Information needed for guidance	Discussion and questioning	Class performance and exams
25	2	The student's understanding of the lesson		Discussion and questioning	Class performance and exams
26	2	The student's understanding of the lesson	Importance of information, types of information	Discussion and questioning	Class performance and exams
27	2	The student's understanding of the lesson	Methods of collecting information (cumulative record, case study, narrative record,	Discussion and questioning	Class performance and exams
28	2	The student's understanding of the lesson	CV, tests and standards, observation, interview)	Discussion and questioning	Class performance and exams
29	2	The student's understanding of the lesson	Counseling and guidance in school	Psychological storming	Class performance and exams
30	2	The student's understanding of the lesson	The guiding teacher, his functions and numbers	Discussion and questioning	Class performance and exams

11. Course Evaluation

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

The degree is distributed through several channels:

1 - Formative (formative) assessment through daily exams, observing and following up on the student's performance in class discussions and homework assignments, and classroom evaluation. This grade does not exceed 20% of the total.

2 - Diagnostic evaluation of the semester and final exams to issue judgments of success and failure. This grade is 80% and is divided into (4) exams for each semester, two exams, to extract the annual endeavor before entering the final exams.

12. Learning and Teaching Resources

Required textbooks (methodology if available)	
Main references (sources)	1- - Educational Guide / Hadi Mishaan, Spring 1909 2- Psychological guidance and counselling. Zahran, Hamed Abdel Salam, 0982. 3- Patterson, S.H., 0980, Theories of Counseling and Psychotherapy, 0th ed. 4- Mental Health Counseling / Sahib Abd Marzouk, Hassan Ali Al-Sayyed 1900.
Recommended supplementary books and references (scientific journals, reports...)	health holiday / Fahim Hussein Al-Tarihi and Hassan Rabie Hammadi..
Electronic references, internet sites	https://ar.wikipedia.org/wiki

Course Description Form

1. Course Name:
Physical Chemistry Laboratory
2. Course Code:
3rd year
3. Semester / Year:
Yearly / **2025-2026**
4. Description Preparation Date:
18 /9/2025
5. Available Attendance Forms:
class and lab attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
90/2 units
7. Course administrator's name (mention all, if more than one name)
Name: Lecturer Asya Akabr Tawfiq Email: asya.akbar@tu.edu.iq

8. Course Objectives	
Course Objectives	• To provide students with knowledge of the principles of physical chemistry as one of the fundamental branches of chemistry. • To develop students' ability by introducing them to the key scientific concepts and rules required to understand the mechanisms of chemical reactions and how to control them. • To teach students how to utilize scientific laws and apply them in practical contexts.

9. Teaching and Learning Strategies	
Strategy	• **Lecture method (standard approach).** • **Discussion and questioning method.** • **Problem-solving method.** • **Brainstorming method.**

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
October 1	3		General Information about the Laboratory	Standard and practical method	Classroom performance and exams
October 2	3		Kinetic study of the decomposition of hydrogen peroxide using a catalyst (analytical method).	Standard and practical method	Classroom performance and exams
October 3	3		Kinetic study of the decomposition of hydrogen peroxide using a catalyst (volumetric method).	Standard and practical method	Classroom performance and exams
October 4	3		• Determination of the reaction order and rate constant of ester hydrolysis.	Standard and practical method	Classroom performance and exams
November 1	3		Determination of the rate constant of ethyl acetate saponification (conductometric method).	Standard and practical method	Classroom performance and exams
November 2	3		Kinetics of ethyl acetate saponification.	Standard and practical method	Classroom performance and exams
November 3	3		First Examination – First Semester	Standard and practical method	Classroom performance and exams
November 4	3		Determination of the reaction order of bromide and bromate ions in alkaline medium via half-life measurements.	Standard and practical method	Classroom performance and exams
December 1	3		• Effect of temperature on reaction rate (Arrhenius equation).	Standard and practical method	Classroom performance and exams
December 2	3		Salt effect on the rate of a chemical reaction.	Standard and practical method	Classroom performance and exams
December 3	3		• Sucrose hydrolysis using polarimetric measurement of optical rotation.	Standard and practical method	Classroom performance and exams
December 4	3		• Determination of reaction order, rate constant, and activation	Standard and practical method	Classroom performance and examinations

			energy for formation of a colored complex.		
January 1	3		General review of experimental kinetic results	Standard and practical method	Classroom performance and exams
January 2	3		Second Examination – First Semester	Standard and practical method	Classroom performance and exams
January 3	3		Spring holiday	–	–
January 4	3		Spring holiday	–	–
February 1	3		Introduction to electrochemistry laboratory experiments	Standard and practical method	Classroom performance and exams
February 2	3		• Equivalent conductivity of strong electrolytes.	Standard and practical method	Classroom performance and exams
March 1	3		• Dissociation constant of weak electrolytes from equivalent conductivity measurements.	Standard and practical method	Classroom performance and exams
March 2	3		• Polymer molecular weight determination using viscosity measurements.	Standard and practical method	Classroom performance and exams
March 3	3		Conductometric titration: strong acid–strong base and weak acid–weak base	Standard and practical method	Classroom performance and exams
March 4	3		• First Examination – Second Semester	Standard and practical method	Classroom performance and exams
April 1	3		• Conductometric titration of mixture of strong and weak acid with strong base.	Standard and practical method	Classroom performance and exams
April 2	3		Decomposition (electrolysis) potential	Standard and practical method	Classroom performance and exams
April 3	3		• Dissociation constants (K1, K2) of phosphoric acid using pH meter.	Standard and practical method	Classroom performance and exams
April 4	3		Adsorption kinetics of methylene blue on activated carbon	Standard and practical method	Classroom performance and exams

May 1	3		General review of experimental electrochemistry results	Standard and practical method	Classroom performance and exams
May 2	3		Second Examination – Second Semester	Standard and practical method	Classroom performance and exams
May 3	3		General review	Standard and practical method	Classroom performance and exams
May 4	3		Final Examinations	Standard and practical method	Classroom performance and exams

11. Course Evaluation

1. 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
2. **Formative assessment** is conducted through observing the student's performance in classroom discussions, homework assignments, and examinations. The coursework grade constitutes **15%**, with an additional **35%** allocated to class activities, making a total of **50%** for continuous assessment.
3. **Summative assessment** is carried out through the final practical and theoretical examinations in order to determine pass or fail status. This component constitutes **50%** of the total grade.

12. Learning and Teaching Resources

Required textbooks (methodology, if any)	*Physical Chemistry – Kinetics*, Dr. Mahmoud Shaker Saeed, University of Mosul, 1990. - *Electrochemistry*, Jalal Mohammed Saleh.
Required Course Manua	*Physical Chemistry Laboratory Manual for Third-Year Chemistry Students* *Prepared by* ***Dr. Mahmoud Shaker, Dr. Adel Saeed, Dr. Imad Abdulilah, and Prof. Safwan Abd Al-Sattar***
Main references (sources)	*Atkins' Physical Chemistry*, Peter Atkins, Julio de Paula, James Keeler, 11th Edition, 2018.
Recommended supporting books and references (scientific journals, reports….)	View all the latest information published in peer-reviewed scientific journals
Electronic references, internet sites	https://scholar.google.com https://www.sciencedirect.com/ https://www.researchgate.net/