Academic Program Description Form

University Name: Southern Technical University.....

Faculty/Institute: AL-Basrah Technical Institute .....

Scientific Department: Chemical Industries Technical.....

Signature:

Head of Department Name:
Maitham Yaseen Atshan

Date: 7/4/2024

Signature:

Scientific Associate Name: Amina Majeed Hassan

Date: 7/4/2024

The file is checked by:

Division of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 7/4/2024

Signature:

Anwar abood

Approval of the Dean

Academic Program Description Form

University Name: **Southern Technical University**.....

Faculty/Institute: **AL–Basrah Technical Institute** .....

Scientific Department: **Chemical Industries Technical**.....

:

Signature:

Head of Department Name:

Maitham Yaseen Atshan

Date: 7/4/2024

Signature:

Scientific Associate Name: **Amina Majeed Hassan**

Date: 7/4/2024

The file is checked by:

Division of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 7/4/2024

Signature:

Approval of the Dean

Academic Description Program

First Year

1. Course Name:
Fluid Flow
2. Semester / Year:
First semester/first academic year
3. Description Preparation Date:
4/4/2024
4. Available Attendance Forms
In presence
5. Number of Credit Hours (Total) / Number of Units (Total) The total number of hours is 105 hours (3h practical + 4h theoretical) / the total number of units is 105
6. Course administrator's name (mention all, if more than one name)
Name: Fitnah Hameed Younis Email: fyounis@stu.edu.iq

7. Course Objectives **Course Objectives**	• The student understands the problems of fluids and energy losses. • Calculating the flow rate in different fluid devices • The student should be able to understand fluids and measure their flow and fluid pressures. • The student should be able to operate fluid devices such as Venturi and Orpheus.
8. Teaching and Learning Strategies **Strategy**	1- Theoretical and Practical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily exams

9. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
First	7	Understanding lecture and practical application	1- Definition of units - international units - conversion from one system to another 2- Giving an idea about the equipment used in the laboratory and how it works	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Second	7	Understanding lecture and practical application	1- Fluid properties - density - compressive viscosity - surface tension Teaching students about graphs	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Third	7	Understanding lecture and practical application	Stable fluid pressure inside vessels Calibration of pressure gauges	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fourth	7		Floating bodies and their stability Test the stability of floating bodies and calculate the amount of displaced liquid	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fifth		Lectures + practical application	Fluid flow - types of flow	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Sixth	7	Understanding lecture and practical application	Study the continuity equation and its derivation Find the flow rate of the fluid over a rectangular, V-shaped barrier	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Seventh	7	Understanding lecture and	Bernoulli's energy equation	Weekly theoretical and	Problem solving, discussion,

		Practical application	Conduct an experiment to find the Reynolds number and energy loss	Practical lectures	Homework, and quizzes
Eighth	7	Understanding lecture and practical application	Applications of Bernoulli's equation - Venturi scale - Orpheus scale - Pitot tube scale Conduct an experiment with the Venturi device and calculate the flow rate and energy loss of the device	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Ninth		Understanding lecture and practical application	The flow of fluid through the vessels calculating the flow through parallel and series connected pipes	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Tenth	7	Understanding lecture and practical application	Transferring fluid from one basin to another Find the experience of pressure loss due to friction inside the pipes Calculating the pressure loss as a result of the fluid passing through the reverse and connecting parts	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Eleventh	7	Understanding lecture and practical application	Pumps - their types - how to connect them Calculating the flow force of the fluid on a hemispherical surface, a flat face	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Twelfth	7	Understanding lecture and practical application	Applications on pumps - Calculating pump efficiency Find the flow rate and efficiency of the reciprocating pump	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes

Thirteenth	7	Understanding lecture and practical application	The effect of expansion and narrowing on the pipe cross-section and energy loss calculation Movement	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fourteenth	7	Understanding lecture and practical application	of solid particles in the fluid Application of Stock's law Fluid flow through	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fifteenth	7	Understanding lecture and practical application	the fillings and calculating the porosity of the filling Calculate the porosity of the filling for an absorption tower and the amount of pressure drop	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes

10. Course Evaluation

Final exam **60% (10 practical + 50 theoretical)**	**40%**	~~Practical degree 10~~ ~~Evaluation degree 10~~ ~~Midterm exam degree 2~~

11. Learning and Teaching Resources

Required textbooks (curricular books, if any) . Practical **Annual quest**	1- مبادئ ميكانيكي الموانع _ الجزء الأول 2 – ميكانيكي الموانع 3 - ميكانيكي الموانع
Main references (sources)	Unit operation of chemical eng., by maccade, published by maccraw-hill, 3ed Edition 1967
Recommended books and references (scientific journals, reports…)	Chemical eng. Vol. (1) and (2) by coulson Richardson, 202.01.

Electronic References, Websites	Unit Operations Of Chemical Engineering, 5th Ed, Mc Cabe And Smith

12. Course Name:
Mechanical units operation
13. Semester / Year:
Second semester/first academic year
14. Description Preparation Date:
4/4/2024
15. Available Attendance Forms:
In presence
16. Number of Credit Hours (Total) / Number of Units (Total)
The total number of hours is 105 hours (3h practical + 4h theoretical) / the total number of units is 105
17. Course administrator's name (mention all, if more than one name)
Name: Fitnah Hameed Younis Email fyounis@stu.edu.iq
18. Course Objectives

Course Objectives	• Introducing the student to classroom equipment and their efficiency • Introducing the student to how to use and handle materials in all their conditions during their transportation and storage. • The student should be able to understand the installation of industrial units. • The student should be able to operate separation and mixing devices and classifiers.

19. Teaching and Learning Strategies	
Strategy	1- Theoretical and Practical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily exams 5- Final exams
20. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	7	Understanding lecture and practical application	Hydration - uses of hydration Hydrolysis mechanism - ΔP calculation	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Second	7	Understanding lecture and practical application	Study of dry and wet palm trees Conduct an experiment and calculate the efficiency of dry and wet sieving	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Third	7	Understanding lecture and practical application	Separation by sedimentation Conduct an experiment and calculate the sedimentation speed for different sized particles	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fourth	7	Understanding lecture and practical application	Separation by centrifuge - Calculating the amount of stress applied to the wall of the centrifuge	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fifth		Lectures + practical application	Gas-solid separation using cyclone - Calculating the efficiency of the cyclone device	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Sixth	7	Understanding lecture and practical application	Convolutional separation - convolution cell	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Seventh	7	Understanding lecture and practical application	Separation by filtration - definition of filtration - factors	Weekly theoretical and	Problem solving, discussion,

			Affecting the efficiency of filtration	Practical lectures	Homework, and quizzes
Eighth	7	Understanding lecture and practical application	Types of filtration devices - Calculating the resistance of the filtration medium and cake layer in the rotary cylinder filtration device	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Ninth		Understanding lecture and practical application	volumetric reduction processes - definition of volumetric reduction - factors affecting volumetric reduction - calculation of jaw crusher efficiency	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Tenth	7	Understanding lecture and practical application	Volumetric reduction devices - operation of volumetric reduction devices - amount of energy consumed - removal of generated heat - calculation of the efficiency of a crusher with bars	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Eleventh	7	Understanding lecture and practical application	Grinding solid materials - types of mills - calculating the effect of speed on the efficiency of the ball mill	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Twelfth	7	Understanding lecture and practical application	Mixing dough – types of dough mixers	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Thirteenth	7	Understanding lecture and practical application	Mixing solids -mixing liquids - types of mixers	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fourteenth	7	Understanding lecture and practical application	Material transportation (solid and liquid)	Weekly theoretical and	Problem solving, discussion,

				Practical lectures	Homework, and quizzes
Fifteenth	7	Understanding lecture and practical application	Storage of materials (solid-liquid)	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes

21. Course Evaluation

Final exam	Annual quest
60% (10 practical + 50 theoretical)	**40%**

Practical degree 10

Evaluation degree 10

Midterm exam degree 20

22. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1- مبادئ ميكانيكي الموانع _ الجزء الأول 2 – ميكانيكي الموانع الدكتور 3 - ميكانيكي الموانع
Main references (sources)	Unit operation of chemical eng., By maccade, published by maccraw-hill, 3ed Edition 1967
Recommended books and references (scientific journals, reports…)	Chemical eng. Vol. (1) and (2) by coulson Richardson, 2001. Unit Operations of Chemical Engineering, 5th Ed, Mc Cabe AndSmith

1. Course Name
Thermodynamics
2. The chapter/ the year
Second semester/first year
3. The date this description was prepared
7/4/2024
4. Available attendance forms
My presence
5. Number of study hours (total)/Number of units (total)
Total number of hours: 90 hour (3theoretical + 3practical) / total number of units 90
6. Name of the course administrator (if more than one name is mentioned)
Name: email:
7. Course objectives

Studying the physical and chemical properties of materials and the laws related to that, and studying the laws related to converting thermal energy into work and vice versa	**Course objectives**

8. Teaching and learning strategies	
1- Practical lectures **2- Homework** **3- Class activities** **4- Daily exams** **5- Final exams 10.**	**The strategy**

9. Course structure

Evaluation method	**Learning method**	**Name of the unit or topic**	**Required learning outcomes**	**hours**	**the week**
Questions and discussion Exams Homework Class assignments Reports	Lectures + work experiences	Gases include: the properties of gases, the molecular kinetic theory of gases with an explanation of the properties of gases	Weekly lectures	6h	the first and the second

		by kinetic theory, the effect of gas volume on pressure, Boyle's law, the effect of temperature on gas volume and pressure, Chart's law, derivation of the general gas law, density and molecular weight of gases, mixture of gases.			
Questions and discussion Exams Homework Class assignments Reports	Lectures + My work experiences	Diffusion of gases, Graham's law, Avogadro's hypothesis, for real gases, Vander Waals equation	Weekly lectures	6 h	Third and fourth
Questions and discussion Exams Homework Class assignments Reports	Lectures + My work experiences	Definition of thermodynamics, work, definition of the ocean, homogeneous-heterogeneous-open-isolated system, isothermal process, adiabatic process - thermodynamic equilibrium -energy - internal energy - the first law of thermodynamics - the inverse process - the greatest work of the inverse isothermal process - enthalpy - heat capacity Under constant volume - heat capacity under constant pressure	Weekly lectures	9 h	Fifth and sixth And the seventh

Questions and discussion Exams Homework Class assignments Reports	Lectures + My work experiences	The relationship between cv, Cp Calculating the heat absorbed under constant pressure The relationship between pressure and temperature - The relationship between volume and temperature - Work done - Thermochemistry, heat of formation	Weekly lectures	9 h	Eighth and ninth And the tenth
Questions and discussion Exams Homework Class assignments Reports	Lectures + My work experiences	Problems and exercises	Weekly lectures	6h	Eleventh and Twelfth
Questions and discussion Exams Homework Class assignments Reports	Lectures + My work experiences	The second law of thermodynamics - entropy - entropy change for irreversible processes - entropy of a mixture of gases - thermal energy - work function -problems and exercises	Weekly lectures	6h	The thirteenth, fourteenth and fifteenth

10. Course evaluation

final exam	Annual quest	
60% (10 practical + 50 theoretical)	40%	Practical degree 10
		Evaluation degree 10
		Midterm exam degree 20

11. Learning and teaching resources

	Required textbooks (methodology, if any)
1. Horace. D. Crock ford. John w. Nouel. Wallace. Baird. Forrest. w.	**Main references (sources)**

Getsen. Laboratory manual of physical. Chemistry – second edition. John willey and sons. 1975. 2. F.Daniels. JWWilliams. Paul Rahort A. Alberty. Daniel. Crownweedl. John E. Harriman. Experimental physical chemistry. 7th edition, Mc Graw hill, Kogak aush a Ltd. Tokyo 1970 3. Daniels. Alberty. FRA Physical Chemistry. 4th edition john wiley and sons. Inc.1975	
	Recommended supporting books and references (scientific journals, reports, ...)
	Electronic references, websites

12.Course Name:
Mathematics-1
13. Semester / Year:2024
First semester/first academic year
14. Description Preparation Date:
7/4/2024
15. Available Attendance Forms:
In presence 30.Number
of Credit Hours (Total) / Number of Units (Total)
The total number of hours is 30 hours (theoretical) / the total number of units is 30
16. Course administrator's name (mention all, if more than one name)
Name: Batool Khairullah Hashim Email bitoul.hashem@stu.edu.iq

17. Course Objectives **Course Objectives**	The typical goals of mathematics education at an advanced stage are to deepen students' mathematical understanding and equip them with the analytical and problem-solving skills necessary for advanced studies and real-world applications in fields such as physics, engineering, and applied mathematics. • Understanding determinants, matrices, and Vectors. • Developing the student's understanding of the applications of velocity, displacement, and acceleration. • Learning differentiation and understanding the derivative and its applications. • Knowledge of applications of isothermal and adiabatic work. • Understanding the laws of heat transfer – velocity in the equation.

18. Teaching and Learning Strategies	
Strategy	1- Practical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily and final exams

19. Course Structure

Week	Hours	Required learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	2hr	Weekly lectures	Matrices - determinants - and their properties	Theoretical lectures	Problem-solving and Discussion
Second	2hr	Weekly lectures	Solving linear equations - Cramer's method - Applications) Ideal gas law - Bernoulli's equation – Continuity equation – Energy conservation equation – Force analysis – Newton’s laws of motion – Kirchhoff's Laws (Ohm's Law)	Theoretical lectures	Problem-solving and discussion
Third	2hr	Weekly lectures	Vectors – Vector analysis – Vector quantity and Measurements	Theoretical lectures	Problem-solving and discussion
Forth	2hr	Weekly lectures	Vector algebra – vector arithmetic operations	Theoretical lectures	Problem-solving and discussion
Fifth	2hr	Weekly lectures	Orthogonal vector unit – vector scale – scalar and cross multiplication	Theoretical lectures	Problem-solving and discussion
Sixth	2hr	Weekly lectures	(Applications) Velocity - Displacement - Acceleration	Theoretical lectures	Problem-solving and discussion
Seventh	2hr	Weekly lectures	Function - trigonometric function - logarithmic functions	Theoretical lectures	Problem-solving and discussion
Eighth	2hr	Weekly lectures	Exponential function - hyperbolic functions - fluid flow - tensile forces	Theoretical lectures	Problem-solving and discussion

	Ninth Weekly	2hr lectures	Limits - Limits of algebraic and trigonometric functions - Finding the area under the curve - Work Adiabatic and isothermal	Theoretical lectures	Problem-solving and discussion
Tenth	2hr	Weekly lectures	Differentiation - derivative - derivative of algebraic functions - chain rule	Theoretical lectures	Problem-solving and discussion
	Eleventh Weekly	2hr lectures	Implicit functions - standard functions - higher-order derivative	Theoretical lectures	Problem-solving and discussion
Twelfth	2hr	Weekly lectures	Derivative of trigonometric functions - derivative of logarithmic functions	Theoretical lectures	Problem-solving and discussion
Thirteenth	2hr	Weekly lectures	Derivative of exponential function - derivative of hyperbolic functions	Theoretical lectures	Problem-solving and discussion
Fourteenth	2hr	Weekly lectures	Applications of isothermal work - adiabatic work - laws of heat transfer - speed in the equation	Theoretical lectures	Problem-solving and discussion
Fifteenth	2hr	Weekly lectures	Maximum and minor limits	Theoretical lectures	Problem-solving and discussion

20. Course Evaluation

final exam	**Annual quest** Evaluation
%70	degree 10
	Midterm exam degree 20

21. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1-1968 2. Applied calculus by L. J . Adams New York, London 1963. 3. Introductory to the College Mathematics by
Recommended books and references (scientific journals, reports…)	William E. Milne.
Electronic References, Websites	Virtual Library (Central Technical University).

1. Course Name:

Mathematics-2

2. Semester / Year:

Second semester/first academic year

3. Description Preparation Date:

7/4/2024

4. Available Attendance Forms:

In presence

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

The total number of hours is 30 hours (theoretical) /
the total number of units is 30

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

Name: Batool Khairullah Hashim Email:

7. Course Objectives

Course Objectives	Mathematics at this stage aims to move the learner to a deeper understanding, which is: • Understand the functions of graphs. •Develop the student's understanding of the applications of speed, acceleration, and the percentage of change in volume with time in a chemical reaction. • The student learns integration and understands its types and applications. • Know how to find the area between a curve, a straight line, and two curves.

	• Solve differential equations • Learn about statistical processes

8. Teaching and Learning Strategies

Strategy	1- Practical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily exams 5-final exams

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
first	2hr	Weekly lectures	Inflection points - plotting functions	Theoretical lectures	Problem-solving and discussion
Second	2hr	Weekly lectures	Physical applications (velocity - acceleration - percentage of change in volume with time in a chemical reaction)	Theoretical lectures	Problem-solving and discussion
Third	2hr	Weekly lectures	Integration – indefinite integral	Theoretical lectures	Problem-solving and discussion
Forth	2hr	Weekly lectures	Integration of algebraic functions	Theoretical lectures	Problem-solving and discussion
Fifth	2hr	Weekly lectures	Integration of exponential and trigonometric functions	Theoretical lectures	Problem-solving and discussion

Sixth	2hr	Weekly lectures	Definite integral	Theoretical lectures	Problem-solving and discussion
Seventh	2hr	Weekly lectures	Applications (work - heat of reaction - area under the curve - area between two curves)	Theoretical lectures	Problem-solving and discussion
Eighth	2hr	Weekly lectures	General methods of integration: the method of substitution and division	Theoretical lectures	Problem-solving and discussion
Ninth	2hr	Weekly lectures	Integration using partial fractions	Theoretical lectures	Problem-solving and discussion
Tenth	2hr	Weekly lectures	Exponential and logarithmic methods of integration	Theoretical lectures	Problem-solving and discussion
Eleventh	2hr	Weekly lectures	Numerical methods in integration - trapezoid rule - Simpson's rule	Theoretical lectures	Problem-solving and discussion
Twelfth	2hr	Weekly lectures	Solve differential and homogeneous equations	Theoretical lectures	Problem-solving and discussion
Thirteenth	2hr	Weekly lectures	Applications (heat capacities - real gases - adiabatic processes)	Theoretical lectures	Problem-solving and discussion
Fourteenth	2hr	Weekly lectures	Statistical operations - frequency distribution - histogram - frequency curve	Theoretical lectures	Problem-solving and discussion
Fifteenth	2hr	Weekly lectures	Arithmetic average - range - standard deviation - variance	Theoretical lectures	Problem-solving and discussion

10. Course Evaluation

final exam	Annual quest
%70	%30

Evaluation degree 10

Midterm exam degree 20

11. Learning and Teaching Resources

	Required textbooks (curricular books, if any)
Main references (sources)	1-حساب التفاضل والتكامل والهندسة التحليلية 2. Applied calculus by L. J. Adams New York, London 1963. 3. Introductory to the College Mathematics by William E. Milne. 4. أسس الحصاء باللغة العربية 5. Introduction to differential equation by S.L. Green 1945
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Virtual Library (Central Technical University).

12. Course Name:
General Chemistry
13. Semester / Year:
First semester/first academic year
14.Description Preparation Date:
4/4/2024
15.Available Attendance Forms:
In presence 18.Number
of Credit Hours (Total) / Number of Units (Total)
The total number of hours is 45 hours (2h practical + 1h theoretical) / the total number of units is 45
19. Course administrator's name (mention all, if more than one name)
Name: Najat Luaibi Ghali Email: Najat.luaibi@stu.edu.iq

16. Course Objectives	
Course Objectives	•Understand basic concepts in chemistry such as Atoms, molecules, and chemical bonds. •Identify the basic laws and principles that govern chemical reactions and changes of matter. •Learn about the periodic tables of elements and understand the role of chemical elements and their properties. • Develop skills in chemistry calculations, such as chemical reaction calculations and chemical equilibrium.

17. Teaching and Learning Strategies	
Strategy	• Theoretical and Practical lectures • Homework assignments • Classroom and extracurricular activities • Daily exams • Final exam

18. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
First	3	Understanding lecture and practical application	Introduction of general chemistry The atom 1	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Second	3	Understanding lecture and practical application	Atomic structure, element chemistry periodic table	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Third	3	Understanding lecture and practical application	Ionization energy, Electro negativity Electro affinity .	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fourth	3	Understanding lecture and practical application	Type of bonding, Covalent bond, Ionic bond , Polar Covalent bond	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fifth	3	Lectures + practical application	Non-Polar Covalent bond	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Sixth	3	Understanding lecture and practical application	Thermodynamic, endothermic and exothermal reactions	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Seventh	3	Understanding lecture and practical application	Thermodynamic, endothermic and exothermal reactions	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Eighth	3	Understanding lecture and practical application	Thermodynamic, endothermic and exothermal reactions	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes

Ninth	3	Understanding lecture and practical application	Qualitative analysis, Quantitative analysis	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Tenth	3	Understanding lecture and practical application	Volumetric and Gravimetric analysis,	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Eleventh	3	Understanding lecture and practical application	Weight factor	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Twelfth	3	Understanding lecture and practical application	Titration process	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Thirteenth	3	Understanding lecture and practical application	Standard solution, suitable indicator	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fourteenth	3	Understanding lecture and practical application	Methods of expression of concentration, Molarity, Normality,	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fifteenth	3	Understanding lecture and practical application	Molality, percentage weight, mole fraction, Examples.	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes

19. Course Evaluation

final exam		**Annual quest**
60% (10 practical + 50 theoretical)	**40%**	Practical degree 10
		Evaluation degree 10
		Midterm exam degree 20

20. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Element of heat transfer by Mjackob & A. hawk 3rd edition 1951. John Willy. London.

Main references (sources)	Chemical process industries by R.N shreve , 3rd edition . McGraw. Hill 1967.
Recommended books and references (scientific journals, reports…)	Text book of practical organic chemistry by, Vogfl. 3rd edition 1954, published by Longman. London
Electronic References, Websites	Virtual Library (Central Technical University).

21. Course Name:
Organic Chemistry
22. Semester / Year:
Second semester/first academic year
23.Description Preparation Date:
4/4/2024
24.Available Attendance Forms:
In presence 30.Number
of Credit Hours (Total) / Number of Units (Total)
The total number of hours is 45 hours (2h practical + 1h theoretical) / the total number of units is 45
25. Course administrator's name (mention all, if more than one name)
Name: Najat Luaibi Ghali Email:
Najat.lauibi@stu.edu.iq

26. Course Objectives	
Course Objectives	• Understand basic organic reactions and sub-Reactions, including ionic, additive, and substitutional reactions, and reactions involving different functional groups •Identify the basic laws and principles that govern chemical reactions and changes of matter. •Identify the molecular structure of organic compounds and understand the influences that determine the shape of the molecule. • Understand and explain complex organic chemical phenomena such as the atoms of organic chemistry and the stability of organic compounds.

27. Teaching and Learning Strategies	
Strategy	• Theoretical and Practical lectures • Homework assignments • Classroom and extracurricular activities • Daily exams • Final exam

28. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
First	3	Understanding lecture and practical application	Principles of organic chemistry, Hydrocarbons, Alkyl halide	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Second	3	Understanding lecture and practical application	Structural and Isomerism Structural Formulae and Nomenclature	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Third	3	Understanding lecture and practical application	Empirical and Molecular Formulae .	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fourth	3	Understanding lecture and practical application	Alkanets, empirical formula, preparation, chemical reaction, physical properties	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fifth	3	Lectures + practical application	Alkenes, , empirical formula, preparation, chemical reaction , physical	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Sixth	3	Understanding lecture and practical application	Properties. Alkynes empirical Formula, preparation, chemical reaction, physical properties	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Seventh	3	Understanding lecture and practical application	Benzene, empirical formula, Cyclo, Aliphatic and Aromatic compounds chemical reaction ,	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Eighth	3	Understanding lecture and practical application	physical properties . Alcohols, , empirical formula, preparation, chemical reaction , physical	Weekly theoretical and	Problem solving, discussion,

			Properties	practical lectures	homework, and quizzes
Ninth	3	Understanding lecture and practical application	Ethers, empirical formula, preparation, chemical reaction, physical properties	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Tenth	3	Understanding lecture and practical application	Phenols, empirical formula, preparation, chemical reaction, physical Properties	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Eleventh	3	Understanding lecture and practical application	Aldehydes and Ketones, empirical formula, preparation, chemical Reaction, physical properties.	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Twelfth	3	Understanding lecture and practical application	Carboxylic acid, empirical formula, preparation, chemical reaction, Physical properties.	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Thirteenth	3	Understanding lecture and practical application	Esters, empirical formula, preparation, chemical reaction, physical Properties.	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fourteenth	3	Understanding lecture and practical application	Amines and Amides, empirical formula, preparation, chemical reaction,	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
Fifteenth	3	Understanding lecture and practical application	Physical properties, Oils and greases.	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes

29. Course Evaluation

Final exam		**Annual quest**
60% (10 practical + 50 theoretical)	**40%**	Practical degree 10 Evaluation degree 10 Midterm exam degree 20

36. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Element of heat transfer by Mjackob & A. hawk 3rd edition 1951. John Willy. London.
Main references (sources)	Chemical process industries by R.N shreve, 3rd edition. McGraw. Hill 1967.
Recommended books and references (scientific journals, reports…)	Text book of practical organic chemistry by, Vogfl. 3rd edition 1954, published by Longman. London
Electronic References, Websites	Virtual Library (Central Technical University).

30. Course Name:

Engineering Drawing-1

31. Semester / Year:

First semester/first academic year

32.Description Preparation Date:

4/4/2024

33.Available Attendance Forms:

In presence

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

The total number of hours is 45 hours (practical) / the total number of units is 45

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

Name: Maitham Yaseen Atshan Email: Yassen.m.maitham@stu.edu.iq

36. Course Objectives

Course Objectives	
	• Identify the concept of engineering drawing and its historical development. • Determine the types of methods for entering coordinates. • Knowledge of using drawing and editing tools. • Draw geometric shapes and diagrams with ease.

37. Teaching and Learning Strategies

Strategy	
	1- Practical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily and final exams

38. Course Structure

Week	Hours Required	Unit or subject name	Learning method	Evaluation method
		learning Outcomes		
the first and second	6 hrs.	Lectures + practical	The importance of engineering drawing -	Weekly lectures
Questions, the discussion		Application	The importance of using a computer to implement engineering	and draw daily paintings

			Drawing - Drawing board sizes (standard) an overview of the AutoCAD program		
Third and fourth	6 hrs.	Lectures + practical Applicatio n	Types of lines in engineering drawing - using drop-downs for lines and texts drawing	Weekly lectures	Questions, discussion And draw daily paintings
Fifth and sixth	6 hrs.	Lectures + practical application	adjustments -Drawing aids	Weekly lectures	Questions, discussion And draw daily paintings
Seventh, eighth and ninth	9 hrs.	Lectures + practical application	Basic shapes	Weekly lectures	Questions, discussion And draw daily paintings
The tenth and eleventh	6 hrs.	Lectures + practical Applicatio	Engineering operations - setting dimensions - applications to previous concepts	Weekly lectures	Questions, discussion And draw daily paintings
Twelfth and thirteenth	6 hrs.	n Lectures + practical	Projection theory - drawing simple projections	Weekly lectures	Questions, discussion And draw daily paintings
Fourteenth and fifteenth	6 hrs.	Applicatio n Lectures + practical Applicatio n	Applications to projection theory	Weekly lectures	Questions, discussion And draw daily paintings

39. Course Evaluation	**50%**	

Final exam	**Annual quest**
50%	Degree boards 20 Evaluation degree 10
	Midterm exam degree20

40. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering drawing (foundation of Technical Education).
Main references (sources)	Engineering drawing technology (Fabbert and Vander).
Recommended books and references (scientific journals, reports…)	Engineering drawing (Abdul Rasul Al Khafaf).
Electronic References, Websites	Virtual Library (Central Technical University).

41. Course Name:
Engineering Drawing-
42. Semester / Year:
Second semester/first academic year
43.Description Preparation Date:
4/4/2024
44.Available Attendance Forms:
In presence
45. Number of Credit Hours (Total) / Number of Units (Total)
The total number of hours is 45 hours (practical) / the total number of units is 45
46.Course administrator's name (mention all, if more than one name)
Name: Email:

47. Course Objectives

Course Objectives	• Visualize a body cut into two parts by a flat cutting surface. • Know the dimensions. • Developing the student's abilities in drawing simple and complex triangular shapes. • Drawing various applications and projects.

48. Teaching and Learning Strategies

Strategy	1- Practical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily and final exams

49. Course Structure

Week	Hours	Required learning Outcomes	Unit or subject name	Learning method	Evaluation method
The first and second	6 hrs.	Lectures + Application	The importance of practical engineering drawing - The importance of using a computer to	Weekly lectures	and draw daily paintings
Questions, the discussion					

			Implement engineering drawing - Drawing board sizes (standard) an overview of the AutoCAD program		
Third and fourth	6 hrs.	Lectures + practical Applicatio n	Types of lines in engineering drawing - using drop-downs for lines and texts drawing	Weekly lectures	Questions, discussion And draw daily paintings
Fifth and sixth	6 hrs.	Lectures + practical application	adjustments -Drawing aids	Weekly lectures	Questions, discussion And draw daily paintings
Seventh, eighth and ninth	9 hrs.	Lectures + practical application	Basic shapes	Weekly lectures	Questions, discussion And draw daily paintings
The tenth and eleventh	6 hrs.	Lectures + practical Applicatio n	Engineering operations - setting dimensions - applications to previous concepts	Weekly lectures	Questions, discussion And draw daily paintings
Twelfth and thirteenth	6 hrs.	Lectures + practical	Projection theory - drawing simple projections	Weekly lectures	Questions, discussion And draw daily paintings
Fourteenth and fifteenth	6 hrs.	Applicatio n Lectures + practical Applicatio n	Applications to projection theory	Weekly lectures	Questions, discussion And draw daily paintings

50. Course Evaluation	**50%**	

Final exam	Annual quest
50%	Degree boards 20 Evaluation degree 10
	Midterm exam degree 20

51. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Engineering drawing (foundation of Technical Education).
Main references (sources)	Engineering drawing technology (Fabbert and Vander).
Recommended books and references (scientific journals, reports…)	Engineering drawing (Abdul Rasul Al Khafaf).
Electronic References, Websites	Virtual Library (Central Technical University).

1. Course Name:

Computer Basics

2. Semester / Year:

First semester/first academic year

4. Description Preparation Date:

4/4/2024

5. Available Attendance Forms:

In presence

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

The total number of hours is 30 hours (1htheoretical+ 1h practical) / the total number of units is 30

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

Name: Email:

8. Course Objectives

Course Objectives	Improving students' skills in English language, developing their reading, writing and listening abilities, and enable them to write Scientific reports in English language

9. Teaching and Learning Strategies

Strategy	• Theoretical and practical lectures • Homework assignments • Classroom and extracurricular activities • Daily and final exams

10. Course Structure

Week	Hours	Required learning Outcomes	Unit or subject name	Learning method	Evaluation method
First and second	2H	Theoretical and Practical lectures	Definition of computers: their generations - their physical and software components	Weekly lectures	Questions, discussion, practice on the computer

					And Daily
Third	2H	Theoretical and practical lectures	Windows XP operating system, the concept of the Windows system - its advantages - its basic requirements - system operation - desktop home screen components Icon concept - method of dealing with mouse effectiveness - the importance and components of the taskbar - taking advantage of Start (to enter programs - the concept of loaded tasks - exit from the system and turn off the computer	Weekly lectures	exam Questions, discussion, practice on the computer And Daily exam
Third	2H	Theoretical and practical lectures	The concept of the window for any program and identify its main components - dealing with desktop icons such as My computer , My Documents , Recycle Bin	Weekly lectures	Questions, discussion, practice on the computer and Daily exam
Fourth	2H	Theoretical and practical lectures	Formatting floppy disks – copying folders and files – taking advantage of cutting and pasting and knowing the characteristics of disks, folders and files	Weekly lectures	Questions, discussion, practice on the computer and Daily
Fifth	2H	Theoretical and practical lectures	Take advantage of control panel programs such as the mouse icon and the display icon, how to change the desktop background, control the screen saver, and change the appearance of window menus and colors	Weekly lectures	exam Questions, discussion, practice on the computer And Daily exam
Sixth	2H	Theoretical and	Take advantage of the option to run programs	Weekly lectures	Questions, discussion,

		Practical lectures	And learn how to get help and its different methods		Practice on the computer And Daily exam
Seventh	2H	Theoretical and practical lectures	Use entertainment programs such as Windows Media Player to play movies. Take advantage of additional software such as calculator. Dealing with the paint program in creating, saving and	Weekly lectures	Questions, discussion, practice on the computer and Daily exam
Eighth	2H	Theoretical and practical lectures	retrieving fees Introduction to Word 2007, Word program call, learning about the program environment (Word screen	Weekly lectures	Questions, discussion, practice on the computer and Daily exam
Ninth	2H	Theoretical and practical lectures	components) Preparing page margins, setting paper size, dealing with the contents of rose orders	Weekly lectures	Questions, discussion, practice on the computer and Daily exam
Tenth	2H	Theoretical and practical lectures	Transfer documents to all orders for issuing roses	Weekly lectures	Questions, discussion, practice on the computer and Daily exam
Eleventh	2H	Theoretical and practical lectures	Weekly lectures dealing with the tab of inclusion	Weekly lectures	Questions, discussion, practice on the computer and Daily exam
Twelfth	2H	Theoretical and practical lectures	To deal with the design tab	Weekly lectures	Questions, discussion, practice on the computer and Daily exam
Thirteenth	2H	Theoretical and	Working with the display tab	Weekly lectures	Questions, discussion,

		Practical lectures			Practice on the computer And Daily
Fourteenth	2H	Theoretical and practical lectures	The concept of computer viruses, how to infect, types and how to treat them	Weekly lectures	exam Questions, discussion, practice on the computer And Daily exam

11. Course Evaluation

Final exam		**Annual quest**
60% (10 practical + 50 theoretical)	40%	Evaluation scores 10 Practical 10 Midterm exam score20

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	New headway plus beginner
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Virtual Library (Central Technical University).

13. Course Name:
English Language
14. Semester / Year:
First semester/first academic year
15. Description Preparation Date:
4/4/2024
16. Available Attendance Forms:
In presence 18.Number
of Credit Hours (Total) / Number of Units (Total)
The total number of hours is 30 hours (theoretical) / the total number of units is 30
17. Course administrator's name (mention all, if more than one name)
Name: Email:
18. Course Objectives

Course Objectives	Improving students' skills in English language, developing their reading, writing and listening abilities, and enable them to write Scientific reports in English language

19. Teaching and Learning Strategies	
Strategy	1- Homework assignments 2- Classroom and extracurricular activities 3- Daily exams

20. Course Structure

Week	**Hours**	**Required Learning Outcomes**	**Unit or subject name**	**Learning method**	**Evaluation method**
First	2H	Theoretical lectures	Unit one: hello I am/are/is, my/your This is with practice in work	Weekly lectures	Questions, discussion and Daily exam

Second	2H	Theoretical lectures	Unit two: your world He/she/they, his/her Questions	Weekly lectures	Questions, discussion and draw daily paintings
Third	2H	Theoretical lectures	Unit three: all about	Weekly lectures	Questions, discussion and draw daily paintings
Fourth	2H	Theoretical lectures	Unit four: family and friends Possessive adjectives Possessive's Has/have Adjective +noun	Weekly lectures	Questions, discussion and draw daily paintings
Fifth	2H	Theoretical lectures	Unit five: the way I live Present simple I/you/we/they A and an Adjective +noun	Weekly lectures	Questions, discussion and draw daily paintings
Sixth	2H	Theoretical lectures	Unit six: every day Present simple he/she Questions and negatives Adverbs of frequency	Weekly lectures	Questions, discussion and draw daily paintings
Seventh	2H	Theoretical lectures	Unit seven: my favorites Question words Pronouns This and that	Weekly lectures	Questions, discussion and draw daily paintings
Eighth	2H	Theoretical lectures	Unit eight: where I live there is/are Prepositions	Weekly lectures	Questions, discussion and Daily exam
Ninth	2H	Theoretical lectures	Unit nine: times past was /were born Past simple-irregular verbs	Weekly lectures	Questions, discussion and Daily exam
Tenth	2H	Theoretical lectures	Unit ten: we had a great time! Past simple- regular & irregular Question	Weekly lectures	Questions, discussion and Daily exam

			Negatives Ago		
eleventh	2H	Theoretical lectures	Unit eleven: I can do that! Can/can't Adverbs Requests	Weekly lectures	Questions, discussion and Daily exam
Twelfth	2H	Theoretical lectures	Unit twelve: please and thank you I'd like… Some and any Like and would like	Weekly lectures	Questions, discussion and Daily exam
Thirteenth	2H	Theoretical lectures	Unit thirteen: here and now Present continuous Present simple & present continuous	Weekly lectures	Questions, discussion and Daily exam
fourteenth	2H	Theoretical lectures	Unit fourteen: it's time to go! Future plans Revision writing email and informant letter	Weekly lectures	Questions, discussion and Daily exam

22. Course Evaluation

final exam		**Annual quest**
70%	30%	Evaluation scores 10 Midterm exam score20

23. Learning and Teaching Resources

Required textbooks (curricular books, if any)	New headway plus beginner
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Virtual Library (Central Technical University).

Annual quest

30% Evaluation scores 10
Midterm exam score20

Virtual Library (Central Technical University).

Academic Description Program

Second Year

1. Course Name:

Petroleum Technology

2. Semester / Year:

Annual\ Second academic year

3. Description Preparation Date: 4/4/2024

4. Available Attendance Forms:

In presence

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

The total number of hours is 150 hours (3 practical + 2 theoretical) / the total number of units is 300

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

Name: Najat Luaibi Ghali Email: Najat.lauibi@stu.edu.iq

7. Course Objectives

Course Objectives	• Identify oil and petroleum industries in terms of formation, extraction and processing • Identifying oil and gas derivatives, how to obtain them, global evaluation methods, their standard specifications, and their chemical and physical composition..

8. Teaching and Learning Strategies

Strategy	1- Theoretical and practical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily exams 5- Final exams

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	3P+2th	Theoretical lectures + Practical application	Introduction to oil - origin of oil - exploration - drilling - production	Weekly lectures	Questions and discussion

					and daily exams
Second	3P+2th	Theoretical lectures + Practical application	Chemical composition of crude oil - hydrocarbon compounds - sulfur compounds - nitrogen compounds - oxygen compounds - metals and other materials	Weekly lectures	Questions and discussion and daily exams
Third	3P+2th	Theoretical lectures + Practical application	Classification of crude oil	Weekly lectures	Questions and discussion and daily exams
Fourth	3P+2th	Theoretical lectures + Practical application	Evaluation of crude oil specifications - density - viscosity - flash and ignition points - residual carbon - percentage of water and salts Evaluation	Weekly lectures	Questions and discussion and daily exams
Fifth	3P+2th	Theoretical lectures + Practical application	of crude oil specifications - sulfur percentage - sediments -hydrogen sulfide - spill point - asphalt percentage - ash percentage - vapor pressure - standard distillation - true boiling point	Weekly lectures	Questions and discussion and daily exams
Sixth	3P+2th	Theoretical lectures + Practical application	Crude oil processing - separation of hydrocarbon and sulfur gases dissolved in crude oil	Weekly lectures	Questions and discussion and daily exams
Seventh	3P+2th	Theoretical lectures + Practical application	Separation of water and salts - industrial refining of crude oil	Weekly lectures	Questions and discussion and daily exams
Eighth	3P+2th	Theoretical lectures + Practical application	Distillation methods - distillation towers	Weekly lectures	Questions and discussion and daily exams
Ninth	3P+2th	Theoretical lectures + Practical application	Ovens - technological diagrams	Weekly lectures	Questions and discussion
Tenth	3P+2th	Theoretical lectures + Practical application	Refining products - properties - specifications - uses - liquid gas - naphtha - gasoline	Weekly lectures	
Eleventh	3P+2th	Theoretical lectures +	Aviation gasoline - kerosene - jet fuel	Weekly lectures	

		Practical application			and daily exams
Twelfth	3P+2th	Theoretical lectures + practical application	Fuel oil - diesel oil - lubricating oils - asphalt - wax	Weekly lectures	Questions and discussion and daily exams
Thirteenth	3P+2th	Theoretical lectures + practical application	Treatment of petroleum derivatives - treatment with caustic soda and sulfuric acid - hydrogenation treatment	Weekly lectures	Questions and discussion and daily exams
Fourteenth	3P+2th	Theoretical lectures + practical application	Thermal cracking - chemical reactions of crushing processes - technological diagram of the crushing process - viscosity cracking	Weekly lectures	Questions and discussion and daily exams
Fifteenth	3P+2th	Theoretical lectures + practical application	Catalytic cracking - its features - factors affecting the catalytic cracking process -chemical reactions in the catalytic cracking process	Weekly lectures	Questions and discussion and daily exams
Sixteenth	3P+2th	Theoretical lectures + practical application	Operating conditions for crushing with catalyst - nutrients - auxiliary factors - technological chart	Weekly lectures	Questions and discussion and daily exams
Seventeenth	3P+2th	Theoretical lectures + practical application	Hydrocracking - influencing factors - operating conditions	Weekly lectures	Questions and discussion and daily exams
Eighteenth	3P+2th	Theoretical lectures + practical application	Catalysts used and materials produced in the hydrocracking process - Hydrocracking reactions - Technology chart	Weekly lectures	Questions and discussion and daily exams
Nineteenth	3P+2th	Theoretical lectures + practical application	Cofactor refinement - chemical reactions - feed material - operating conditions - products	Weekly lectures	Questions and discussion and daily exams
Twentieth	3P+2th	Theoretical lectures + practical application	Lubricating oils - its properties and uses	Weekly lectures	
Twenty-first	3P+2th	Theoretical lectures + practical application	Lubricating oils industry - lubricating oils processing - asphalt removal - used oils purification	Weekly lectures	

Twenty-Second	3P+2th	Theoretical lectures + Practical application	Removing wax from lubricating oils - improving the properties of lubricating oils - purifying used oils	Weekly lectures	Questions and discussion and daily exams
Twenty-third	3P+2th	Theoretical lectures + Practical application	Gas manufacturing - natural gas sources - chemical composition of natural gas	Weekly lectures	Questions and discussion and daily exams
Twenty-fourth	3P+2th	Theoretical lectures + Practical application	Dry - wet - liquid - liquefied natural gas -sour gas - sweet gas - raw liquid petroleum gases -	Weekly lectures	Questions and discussion and daily exams
Twenty-fifth	3P+2th	Theoretical lectures + Practical application	Stages of evaluating the natural gas industry - Exploration and drilling stage - Developmental spinning stage for potential gasoline production - Field development stage - Purification, separation of hydrocarbon materials and drying - Gas liquefaction stage	Weekly lectures	Questions and discussion and daily exams
Twenty-sixth	3P+2th	Theoretical lectures + Practical application	Natural gas processing operations - natural gas desalination	Weekly lectures	Questions and discussion and daily exams
Twenty-seventh	3P+2th	Theoretical lectures + Practical application	Natural gas dehydration - natural gas desalination	Weekly lectures	Questions and discussion and daily exams
Twenty-eighth	3P+2th	Theoretical Lectures + practical application	Sulfur removal and recovery	Weekly lectures	Questions and discussion and daily exams
Twenty-ninth	3P+2th	Theoretical lectures + Practical application	Environmental pollution as a result of oil industries - air pollution	Weekly lectures	
Thirtieth	3P+2th	Theoretical lectures + Practical application	Water pollution - soil pollution - pollution control	Weekly lectures	

10. Course Evaluation

Annual quest		Final
Practice degree 20		exam

Evaluation degree10	50%	5%	
Theoretical degree 20		10 practical degree	40 theoretical degree

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Properties, classification and evaluation of and its products, Dr. Hamid bin Harhara
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	Virtual Library (Central Technical University)

1. Course Name:

Thermal unit operations

2. Semester / Year:

Annual\ Second academic year

3. Description Preparation Date:

6/4/2024

4. Available Attendance Forms:

In presence

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

The total number of hours is 210 hours (3 practical + 4 theoretical) / the total number of units is 420

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

Name: Ataa Wejood Ali Email: awejood@lecturers.stu.edu.iq

7. Course Objectives

Course Objectives	• Determine how to deal and analyze different Chemical separation devices. • The student examines and tests thermal conductivity coefficient • The student will be able to study the effect of Reynolds on heat transfer coefficient. • The student acquires manual skills in the use of Heat exchangers and study the heat transfer in heat Exchangers.

8. Teaching and Learning Strategies

Strategy	• Theoretical and practical lectures • Laboratories and practice • summer training • Homework assignments • Daily exams • Final exams

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	7	Theoretical lectures + Practical application	Thermal process, basic principles, heat transfer by conduction Heat	Weekly lectures	Questions and discussion and daily exams
Second	7	Theoretical lectures + Practical application	transfer by convection, normal and forced convection processes	Weekly lectures	Questions and discussion and daily exams
Third	7	Theoretical lectures + Practical application	Heat exchangers, types and heat balance, evaporation processes	Weekly lectures	Questions and discussion and daily exams
Fourth	7	Theoretical lectures + Practical application	Shell and tube heat exchangers	Weekly lectures	Questions and discussion and daily exams
Fifth	7	Theoretical lectures + Practical application	Condensation types, condensation by drops	Weekly lectures	Questions and discussion and daily exams
Sixth	7	Theoretical lectures + Practical application	Radiation heat Transfer, Kirchhoff and steven boltzman laws	Weekly lectures	Questions and discussion and daily exams
Seventh	7	Theoretical lectures + Practical application	Duhring rule and evaporators types, heat balance of evaporation	Weekly lectures	Questions and discussion
Eighth	7	Theoretical lectures + Practical application	Single effect evaporator, heat balance of single effect	Weekly lectures	
Ninth	7	Theoretical lectures + Practical application	Multifactor evaporators, capacity	Weekly lectures	

			of evaporator and economy		and daily exams
Tenth	7	Theoretical lectures + Practical application	Distillation process, vapor and liquid equilibrium, relative volatility	Weekly lectures	Questions and discussion and daily exams
Eleventh	7	Theoretical lectures + Practical application	Types of distillation processing	Weekly lectures	Questions and discussion and daily exams
Twelfth	7	Theoretical lectures + Practical application	Number of trays calculation, material balance equations	Weekly lectures	Questions and discussion and daily exams
Thirteenth	7	Theoretical lectures + Practical application	Different theories to calculate number of trays, feeding line	Weekly lectures	Questions and discussion and daily exams
Fourteenth	7	Theoretical lectures + Practical application	Reflux ratio, Lewis theory to calculate number of trays	Weekly lectures	Questions and discussion and daily exams
Fifteenth	7	Theoretical lectures + Practical application	Uncontinous distillation, isotropic distillation, vapor distillation	Weekly lectures	Questions and discussion and daily exams
Sixteenth	7	Theoretical lectures + Practical application	Absorption of gases, mass transfer by diffusion	Weekly lectures	Questions and discussion and daily exams
Seventeenth	7	Theoretical Lectures + practical application	Operation line calculation, hight of tower calculation	Weekly lectures	Questions and discussion and daily exams
Eighteenth	7	Theoretical lectures + Practical application	Absorption towers, definition and types	Weekly lectures	Questions and discussion
Nineteenth	7	Theoretical lectures + Practical application	Mass transfer Devices, Trays columns, Factors effecting the efficiency of Trays, packed Columns	Weekly lectures	
Twentieth	7	Theoretical lectures +	Liquid – liquid Extraction, Choosing	Weekly lectures	

		Practical application	The right Solvent, Equilibrium State in triple system		And daily exams
Twenty-first	7	Theoretical lectures + Practical application	Continuous extraction, types of extraction devices	Weekly lectures	Questions and discussion and daily exams
Twenty-Second	7	Theoretical lectures + Practical application	Solid – liquid extraction, factors effecting on solid – liquid extraction	Weekly lectures	Questions and discussion and daily exams
Twenty-third	7	Theoretical lectures + Practical application	Types and uses of solid – liquid extraction	Weekly lectures	Questions and discussion and daily exams
Twenty-Fourth	7	Theoretical lectures + Practical application	Cooling towers, Vapor and air System,	Weekly lectures	Questions and discussion and daily exams
Twenty-fifth	7	Theoretical lectures + Practical application	Cooling towers, Different theory Principles, cooling Tower's calculations, Types of cooling towers	Weekly lectures	Questions and discussion and daily exams
Twenty-sixth	7	Theoretical lectures + Practical application	Drying, drying rate, drying time Calculation, during curve	Weekly lectures	Questions and discussion and daily exams
Twenty-Seventh	7	Theoretical lectures + Practical application	Uncontinous drying mechanism, The effects of operation condition on drying process	Weekly lectures	Questions and discussion and daily exams
Twenty-Eighth	7	Theoretical lectures + Practical application	Drying devices, types, uses, how to dry gases	Weekly lectures	Questions and discussion and daily exams
Twenty-ninth	7	Theoretical lectures + Practical application	Adsorption, adsorbed material calculation, equilibrium relationship in adsorption	Weekly lectures	
Thirtieth	7	Theoretical lectures + Practical application	Crystallization, theory of crystallization, devices, uses and types	Weekly lectures	

11. Course Evaluation

Annual quest	final exam

Practice degree 20 Evaluation degree10 Theoretical degree 20	50%	50%	
		10 practical degree	40 theoretical degree

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	تشغيل الوحدات الحرارية / 1992
Main references (sources)	الخواص والتصنيف والتقييم للنفط ومنتجاته
Recommended books and references (scientific journals, reports…)	1. Element of heat transfer by Mjackob & A. hawk 3rd edition 1951. John willy. London . New York 2. Unit operation of Chemical Eng. By W.L. McGrwa . Hill. 3. Chemical Eng . I. By j.M.Coulson & j.f . Rishardson. 2nd edition 1970 . Perhaman Press . oxford
Electronic References, Websites	المكتبة الافتراضية

1. Course Name:
Chemical Industries
2. Semester / Year:
Annual/ Second academic year
3. Description Preparation Date:
7/4/2024
4. Available Attendance Forms:
In presence

5. Number of Credit Hours (Total) / Number of Units (Total)	
The total number of hours is 180 hours (3 practical + 3 theoretical) / the total number of units is 360	
6. Course administrator's name (mention all, if more than one name)	
Name: Batool Khirullah Hashim Email: bitoul.hashem@stu.edu.iq	
7. Course Objectives	
Course Objectives	•This course aims to recognize the production processes at their various stages, starting from raw materials and ending with industrial output. •Developing the ability to analyze complex chemical problems and devise effective solutions to them. . •Study the details of the production processes of various chemicals such as polymers, fertilizers, and raw chemicals. •The ability to manage time and resources: Enhancing the ability to manage time effectively to complete tasks and projects on time, and the ability to use available resources sustainably and effectively. Introducing the student to how to use different thermal units. •The graduate will be able to operate and control most chemical industrial units •Carrying out various chemical laboratory tests for raw materials and resulting materials and the ability to analyze and improve them •Implementing periodic maintenance work for various thermochemical and mechanical industrial units in order to achieve the highest levels of safety at work • The graduate will be familiar with maps and plans related to industrial units and factories and how to deal with them
8. Teaching and Learning Strategies	
Strategy	1- Theoretical and practical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily exams 5- Final exams
9. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	6	Theoretical lectures + Practical application	Chemical Manufacturing Units, Physical Process Units, Fluid Flow, Heat Transfer	Weekly lectures	Questions and discussion and daily exams
Second	6	Theoretical lectures + Practical application	International Quality System (ISO), Iraqi standard specifications	Weekly lectures	Questions and discussion and daily exams
Third	6	Theoretical lectures + Practical application	1-Water conditioning. 2- . Water Conditioning methods	Weekly lectures	Questions and discussion and daily exams
Fourth	6	Theoretical lectures + Practical application	Treatment of sewage and industrial water waste.	Weekly lectures	Questions and discussion and daily exams
Fifth	6	Theoretical lectures + Practical application	1 -Industrial gases 2- Natural gas	Weekly lectures	Questions and discussion and daily exams
Sixth	6	Theoretical lectures + Practical application	1 -Nitrogen, carbon dioxide, 2- Methods of removing impurities from gases	Weekly lectures	Questions and discussion and daily exams
Seventh	6	Theoretical lectures + Practical application	1 -Ceramic industry, raw materials 2 -Ceramic industry 3 -Bricks	Weekly lectures	Questions and discussion and daily exams
Eighth	6	Theoretical lectures + Practical application	4- And the fire bricks Glass, its types, raw materials, formation methods, methods of converting glass mixtures from laboratory to industrial and vice versa	Weekly lectures	Questions and discussion
Ninth	6	Theoretical lectures +	Cement industry and its types.	Weekly lectures	

		Practical application			and daily exams
Tenth	6	Theoretical lectures + Practical application	Table salt and the manufacture of its compounds (sodium carbonate, caustic soda industry)	Weekly lectures	Questions and discussion and daily exams
Eleventh	6	Theoretical lectures + Practical application	Sulfur and sulfuric Acid Extracting sulfur from mines	Weekly lectures	Questions and discussion and daily exams
Twelfth	6	Theoretical lectures + Practical application	Fertilizers, nitrogenous compounds, ammonia, urea	Weekly lectures	Questions and discussion and daily exams
Thirteenth	6	Theoretical lectures + Practical application	Nitric acid. Aluminum sulphate, aluminum nitrate	Weekly lectures	Questions and discussion and daily exams
Fourteenth	6	Theoretical lectures + Practical application	Phosphate fertilizer industry	Weekly lectures	Questions and discussion and daily exams
Fifteenth	6	Theoretical lectures + Practical application	Pharmaceutical industries	Weekly lectures	Questions and discussion and daily exams
Sixteenth	6	Theoretical lectures + Practical application	Plant Oils: Extraction, Purification, and Hydrogenation	Weekly lectures	Questions and discussion and daily exams
Seventeenth	6	Theoretical lectures + Practical application	Soap and Detergent Manufacturing	Weekly lectures	Questions and discussion and daily exams
Eighteenth	6	Theoretical lectures + Practical application	Sugar and Starch Industry	Weekly lectures	Questions and discussion
Nineteenth	6	Theoretical lectures + Practical application	Fermentation Industry: Pure Alcohol, Vinegar, Acetic Acid	Weekly lectures	
Twentieth	6	Theoretical lectures + Practical application	Paper Industry: Raw Materials, Pulp	Weekly lectures	

			Manufacture, Paper Making		and daily exams
Twenty-first	6	Theoretical lectures + practical application	Chemical Processes Kinetics, Polymerization, Polymerization Methods	Weekly lectures	Questions and discussion and daily exams
Twenty-second	6	Theoretical lectures + practical application	Chemical Processes Influencing Factors, Chemical Reactors and Types	Weekly lectures	Questions and discussion and daily exams
Twenty-third	6	Theoretical lectures + practical application	Petrochemical Industry Fundamentals, Petrochemical Industry Distinctive Properties	Weekly lectures	Questions and discussion and daily exams
Twenty-fourth	6	Theoretical lectures + practical application	Intermediate Petrochemicals Production from Natural Gases and Petroleum Derivatives, Petrochemical Products, Intermediate, Final	Weekly lectures	Questions and discussion and daily exams
Twenty-fifth	6	Theoretical lectures + practical application	Synthetic Fiber Industry: Artificial Silk, Cellulose Derivatives, Nylon, and Acrylic	Weekly lectures	Questions and discussion and daily exams
Twenty-sixth	6	Theoretical lectures + practical application	Plastics: Properties, Types, Additives, Manufacturing Methods (PEHD, PELD), Polypropylene, Polystyrene	Weekly lectures	Questions and discussion and daily exams
Twenty-seventh	6	Theoretical lectures + practical application	Natural and Synthetic Resins and Their Mechanical Action in Pollution Removal and Element Concentration	Weekly lectures	Questions and discussion and daily exams
Twenty-eighth	6	Theoretical lectures + practical application	Polyethylene, Polypropylene, PVC	Weekly lectures	Questions and discussion and daily exams
Twenty-ninth	6	Theoretical lectures + practical application	Rubber: Natural and Synthetic Rubber, Various Examples	Weekly lectures	
Thirtieth	6	Theoretical lectures + practical application	Environmental Pollution Due to Chemical Industries, Types, Treatment Methods	Weekly lectures	

10. Course Evaluation

Annual quest		final exam	
Practice degree 20	50%	50%	
Evaluation degree10			
Theoretical degree 20		10 practical degree	40 theoretical degree

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	.2Astm stands. Published in 1960 American society for testing Material.
Main references (sources)	Chemical process industries by R.N shre , 3rd edition . McGraw. Hill 1967 .
Recommended books and references (scientific journals, reports…)	Text book of practical organic chemistry, Vogfl. 3rd edition 1954, published Longman. London
Electronic References, Websites	Unit Operations of Chemical Engineer in 5th Ed, Mc Cabe and Smith

1. Course Name:

Control and Measurements

3. Semester / Year:

Annual/ Second academic year

4. Description Preparation Date:

4/4/2024

5. Available Attendance Forms:

In presence

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

The total number of hours is 120 hours (2 practical + 2 theoretical) /

the total number of units is 240
7. Course administrator's name (mention all, if more than one name)
Name: Email:
8. Course Objectives

Course Objectives	•The student will be able to identify electrical materials and wiring systems used in laboratories and homes, establish and install electrical machines, and methods of controlling and protecting various loads during the establishment. •The student will be able to have practical knowledge of electrical installations (lighting), in addition to - how to establish and install electrical machines. •The student will be able to become familiar with: electronic components manufactured from semiconductors of their various types, composition, properties, and uses in electronic circuits. •Providing a clear and comprehensive picture of occupational safety and protection methods to prevent accidents during work. •The student will be able to analyse, examine and deal with electrical circuits. • The student acquires manual skills in using hand tools, measuring tools, and operating and using devices.
9. Teaching and Learning Strategies	
Strategy	1- Theoretical and practical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily exams 5- Final exams
10. Course Structure	

Week	Hours Required	Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	3P+2th	Theoretical lectures + practical application	Purposes of Measurements, Used terms	Weekly lectures	Questions and discussion and daily exams

Second	3P+2th	Theoretical lectures + practical application	Errors, Accuracy and Measurement principles	Weekly lectures	Questions and discussion and daily exams Questions and
Third	3P+2th	Theoretical lectures + practical application	Signal transmitting, Pointing and Recording instruments, the Units	Weekly lectures	discussion and daily exams Questions and discussion and
Fourth	3P+2th	Theoretical lectures + practical application	Principals of Electricity, Electrical energy and Electrical power , Ohm s Law, Resistors, Capacitors	Weekly lectures	daily exams Questions and discussion and daily exams
Fifth	3P+2th	Theoretical lectures + practical application	Magnetism, Electrical Magnetism, Direct current, Alternating current, Inductors	Weekly lectures	Questions and discussion and daily exams
Sixth	3P+2th	Theoretical lectures + practical application	Electric circuits, Kirchhoff ´s Law , Electrical measuring, Instruments ,The (V , A , AVO) meters	Weekly lectures	Questions and discussion and daily exams Questions and discussion and
Seventh	3P+2th	Theoretical lectures + practical application	Whetstone Bridge, Power Measurement	Weekly lectures	daily exams Questions and discussion and daily exams
Eighth	3P+2th	Theoretical lectures + practical application	Transformers, Structure, Connection, Function	Weekly lectures	Questions and discussion and
Ninth	3P+2th	Theoretical lectures + practical application	Temperature Measurement, touching methods Temperature Measurement, Radiation methods	Weekly lectures	daily exams Questions and discussion
Tenth	3P+2th	Theoretical lectures + practical application	Measurement of Volumes, Mass and Flow Rates, Impact and Electric methods	Weekly lectures	
Eleventh	3P+2th	Theoretical lectures +	Measuring instruments of	Weekly lectures	

		practical application	liquids, Solids and gas levels(height)		and daily exams
Twelfth	3P+2th	Theoretical lectures + practical application	Measurements of distances, angles and dimensions	Weekly lectures	Questions and discussion and daily exams
Thirteenth	3P+2th	Theoretical lectures + practical application	Measurement of Humidity, thermometers method (thermometric)	Weekly lectures	Questions and discussion and daily exams
Fourteenth	3P+2th	Theoretical lectures + practical application	Instrument of measuring electric resistor	Weekly lectures	Questions and discussion and daily exams
Fifteenth	3P+2th	Theoretical lectures + practical application	ohms law	Weekly lectures	Questions and discussion and daily exams
Sixteenth	3P+2th	Theoretical lectures + practical application	Kirchhoff law	Weekly lectures	Questions and discussion and daily exams
Seventeenth	3P+2th	Theoretical lectures + practical application	connection of resisters in series	Weekly lectures	Questions and discussion and daily exams
Eighteenth and Nineteenth	3P+2th	Theoretical lectures + practical application	connection of resisters in parallel	Weekly lectures	Questions and discussion and daily exams
twentieth	3P+2th	Theoretical lectures + practical application	unbalanced Wheatstone bridge	Weekly lectures	Questions and discussion and daily exams
Twenty-first	3P+2th	Theoretical lectures + practical application	Connection of capacitors in series, connection of capacitors in parallel	Weekly lectures	daily exams
Twenty-second	3P+2th	Theoretical lectures + practical application	connection of capacitors and resister in series	Weekly lectures	
Twenty-third	3P+2th	Theoretical lectures + practical application	electric motor	Weekly lectures	

Twenty-fourth	3P+2th	Theoretical lectures + practical application	photo resisters	Weekly lectures	Questions and discussion and daily exams
Twenty-fifth	3P+2th	Theoretical lectures + practical application	Principals of Operating and Measurement Pressure measurement, Mechanical methods, Electrical methods	Weekly lectures	Questions and discussion and daily exams
Twenty-sixth	3P+2th	Theoretical lectures + practical application	Temperature Measurement, touching methods Temperature Measurement, Radiation methods Temperature Measurement, touching methods Temperature Measurement, Radiation methods	Weekly lectures	Questions and discussion and daily exams
Twenty-seventh	3P+2th	Theoretical lectures + practical application	Measurement of Volumes, Mass and Flow Rates, Impact and Electric methods	Weekly lectures	Questions and discussion and daily exams
Twenty-eighth	3P+2th	Theoretical lectures + practical application	Measuring instruments of liquids, Solids and gas levels(height) Measurements of distances, angles and dimensions	Weekly lectures	Questions and discussion and daily exams
Twenty-ninth and Thirtieth	3P+2th	Theoretical lectures + practical application	Measurement of Humidity, thermometers method (thermometric)	Weekly lectures	

Course Evaluation

Annual quest		final exam	
Practice degree 20	50%		50%
Evaluation degree10			
Theoretical degree 20		10 practical degree	40 theoretical degree

Learning and Teaching Resources

12. Required textbooks (curricular books, if any) Main references (sources)	الدوائر والقياسات الكهربائية ( )
Recommended books and references (scient journals, reports…)	1- Introductory circuit analyses (Boylestad).

Electronic References, Websites	2- Electrical-and-electronic-technology (Hughes) الدوائر الكهربائية (1) (2) المؤسسة العامة للتدريب المهني والتقني
	https://phet.colorado.edu/ https://www.electronicshub.org/

1. Course Name:
Materials Properties
2. Semester / Year:
First Semester/ Second academic year
3. Description Preparation Date:
4/4/2024
4. Available Attendance Forms:
In presence
5. Number of Credit Hours (Total) / Number of Units (Total)
The total number of hours is 60 hours (2 practical + 2 theoretical) / the total number of units is 60
6. Course administrator's name (mention all, if more than one name)
Name: Marwa Kifah Bader Email: marwa.kifah@stu.edu.iq
7. Course Objectives

Course Objectives	• • Teaching the student to the types of minerals, their properties, specifications, uses and how to extract them • teaching the student to the effects of external forces, stresses and deformations and how to address them through mathematical relationships • Teaching the student how to examine metals to know their mechanical properties (hardness - durability - shock tensile resistance and pressure). • Provide the student with sufficient information to preserve metals from corrosion

8. Teaching and Learning Strategies	
Strategy	1- Theoretical and practical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily exams 5- Final exams

9. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1, 2	8	Theoretical lectures + practical application	Definitions of forces, stresses, deformations, and mathematical problems about forces and moments,	Weekly lectures	Questions and discussion and daily exams
3,4	8	Theoretical lectures + practical application	Stresses, compression, stress-action diagram and mathematical problems	Weekly lectures	Questions and discussion and daily exams
5,6,7	12	Theoretical lectures + practical application	Shear stresses on rivet, welding when splicing, torsion stresses and mathematical problems	Weekly lectures	Questions and discussion and daily exams
8,9,10	12	Theoretical lectures + practical application	Stresses on cylinder walls, various tanks, mathematical problems	Weekly lectures	Questions and discussion and daily exams
11,12	8	Theoretical lectures + practical application	Mining science - iron and steel - its ore - properties and extraction	Weekly lectures	Questions and discussion and daily exams
13,14,15	12	Theoretical lectures + practical application	High furnace and extraction and cast iron and its properties and non-	Weekly lectures	Questions and discussion and daily exams

			ferrous metals (copper - aluminum tin - lead - zinc) properties - extraction and specifications –uses		

10. Course Evaluation

Annual quest		final exam	
Practice degree 20	50%	50%	
Evaluation degree10			
Theoretical degree 20		10 practical degree	40 theoretical degree

11. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	مقاومة مواد
Recommended books and references (scientific journals, reports…)	مقاومة مواد + ميكانيك
Electronic References, Websites	Virtual Library (Central Technical University)

49.Course Name:
Devices Construction
50.Semester / Year:
Second semester/first academic year
51.Description Preparation Date:
4/4/2024
52.Available Attendance Forms:
In presence 54.Number
53.of Credit Hours (Total) / Number of Units (Total)
The total number of hours is 60 hours (2h practical + 2h theoretical) / the total number of units is 45
54.Course administrator's name (mention all, if more than one name)
Name: Marwa Kifah Bader Email: marwa.kifah@stu.edu.iq
55. Course Objectives

Course Objectives	• Teaching the student theoretically how to operate and maintain devices used in the chemical industries • Teaching the student theoretically and practically the maintenance and installation of systems and accessories for devices used in the chemical industries such as pipes, valves and links • teaching the student accurately theoretically and practically about the installation and construction of devices used in the chemical industry

56. Teaching and Learning Strategies

Strategy	• Theoretical and Practical lectures • Homework assignments • Classroom and extracurricular activities • Daily exams • Final exam

57. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	3	Understanding lecture and practical application	Introduction to production processes in kiwia industries Pipes, networks and accessories Types	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
3,4	3	Understanding lecture and practical application	of pipes made of steel - cast iron - glass Valves are important, types and how to connect them	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
5,6,7	3	Understanding lecture and practical application	Insulators, their importance, uses and types Thermostatic group Thermodynamic Group	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes

8,6,10	3	Understanding lecture and practical application	Pumps Operation Meaning Pumping Piston pumps, their types and uses Pumps types and uses Rotary pumps, types and uses	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
11, 12	3	Lectures + practical application	Compressors meaning of compression Types of compressors and their uses The Egyptian pressure - its use and types	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes
13, 14, 15	3	Understanding lecture and practical application	Boilers importance, uses, types and fuel used Boilers with hydro and flame pipes Heat exchangers, types, uses and maintenance	Weekly theoretical and practical lectures	Problem solving, discussion, homework, and quizzes

58. Course Evaluation

final exam	Annual quest	
50% (10 practical + 40 theoretical)	**50%**	Practical degree 20 Evaluation degree 10 Midterm exam degree 20

59. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Chemical Factory Technology Allison & Taylor
Recommended books and references (scientific journals, reports…)	Chemical Engineering Plant Design by Peter

Electronic References, Websites	Virtual Library (Central Technical University)

1. Course Name:
English language
2. Semester / Year:
Second academic year
3. Description Preparation Date:
4/4/2024
4. Available Attendance Forms:
In presence
5. Number of Credit Hours (Total) / Number of Units (Total)
The total number of hours is 30 hours (theoretical) / the total number of units is 30
6. Course administrator's name (mention all, if more than one name)

Name:
Email

7. Course Objectives

Course Objectives	Improving students' skills in English language, developing their reading, writing and listening abilities, and enable them to write Scientific reports in English language.

8. Teaching and Learning Strategies

Strategy	1- Theoretical lectures 2- Homework assignments 3- Classroom and extracurricular activities 4- Daily exams

9. Course Structure

Week	**Hours Required**	**Unit or subject name**	**Learning method**	**Evaluation method**
		learning Outcomes		
first+ second	2H	Theoretical lectures Unit one: getting to know you Tenses Questions Questions words	Weekly lectures	Questions, discussion and Daily exam
Third+ fourth	2H	Theoretical lectures Unit two: the way we live Present tenses Present simple Present continuous Have/ have got	Weekly lectures	Questions, discussion and Daily
Fifth + sixth	2H	Theoretical lectures Unit three: It all went wrong Past tenses Past simple	Weekly lectures	Questions, discussion and Dail exam
Seventh+ eighth discussio	2H	Theoretical lectures Unit four: let's go shopping Quantity Much and many Some and any something, anyone, nobody, Everywhere A few, a little, a lot of Articles	Weekly lectures	Questions, and Daily exam
Ninth+ tenth	2H	Theoretical lectures Unit five: what do you want to do Past tenses Verb patterns1 Future intentions going to and will	Weekly lectures	Questions, discussio and Daily exam

Eleventh+ twelfth	2H	Theoretical lectures	Unit six: tell me! What's it like? What's it like? Comparative and superlative Adjectives	Weekly lectures	Questions, discussion and Daily exam
Thirteenth+ fourteenth	2H	Theoretical lectures	Unit seven: fame Present Perfect and past simple for and since Tense revision	Weekly lectures	Questions, discussion and Daily exam
Fifteenth+ sixteenth	2H	Theoretical lectures	Unit eight: do's and don'ts have (got) to Should Must	Weekly lectures	Questions, discussion and Daily exam
Seventeenth+ eighteenth	2H	Theoretical lectures	Unit nine: going Places Time and conditional clauses what if…?	Weekly lectures	Questions, discussion and Daily exam
Nineteenth +twentieth	2H	Theoretical lectures	Unit ten: scared to death Verbs Patterns Infinitives What, etc. +infinitive Something, etc.+ infinitive	Weekly lectures	Questions, discussion and Daily exam
Twenty first – twenty second	2H	Theoretical lectures	Something, etc.+ infinitive Unit eleven: things that changed the world Passives	Weekly lectures	Questions, discussion and Daily exam
Twenty third – twenty fourth	2H	Theoretical lectures	Unit twelve: dreams and reality Second conditional Might	Weekly lectures	Questions, discussion and Daily exam
Twenty fifth – twenty sixth	2H	Theoretical lectures	Unit thirteen: earning a living Present perfect continuous Present perfect simple versus continuous	Weekly lectures	Questions, discussion and Daily exam
Twenty seventh – twenty eighth	2H	Theoretical lectures	Unit fourteen: family ties Present perfect and past perfect and clarification Reported statements	Weekly lectures	Questions, discussion and Daily exam
Twenty ninth – thirtieth	2H	Theoretical lectures	Unit fifteen : revision	Weekly lectures	Questions, discussion and Daily exam

10. Course Evaluation

Final exam	Annual quest

	70%	30%	Evaluation degree 10 Midterm exam score20

11. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	New headway plus pre - intermediate
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Virtual Library (Central Technical University).

Course Name
Professional ethics
Semester/ year
annual
The date this description was prepared
4/4/2024
Available attendance forms
Mandatory physical presence in classrooms and laboratories
Number of study hours (total)/ number of units (total)
Total number of hours (30)/ number of units (30)
Name of the course administrator (if more than one name is mentioned)
Name email:
Course objectives

The course aims to introduce students of technical institutes to professional ethics according to their technical specialization, and to provide them with professional ethical rules that enhance their commitment to them, in their expected field of .work after graduation	**General cognitive goals**
They are set by the subject's teachers (as behavioral objectives) within the framework of the .lesson plan at the single lecture level	**Objectives specified**
Carrying out duties at the work site for professional motives and adhering to the ethics and rules of professional conduct for administrative work in warehouses and according to the nature of .the work	**Objectives Value**

Teaching and learning strategies	
Theoretical lectures/discussion	**The strategy**

Course structure						
Evaluation method	**Learning method**	**Name of the unit or topic**	**Required learning Outcomes**	**hours**	**the week**	
heoretic	**and**		**Knowledge/value**	**4**	**2+1**	
Oral and tests	**Theoretical lectures discussion/ written**	**Work and s**	**Knowedge/value profession**	**2**	**3**	
Oral and tests	**Theoretical lectures discussion/ written**	**Professionals**	**Knowledge/value ethics**	**2**	**4**	
Oral and written tests	**Theoretical lectures discussion/**	**Values and professional ethics**	**Knowledge/values**	**4**	**6+5**	
Oral and written tests	**Theoretical lectures discussion/**	**Patterns of unethical behavior in the profession**	**Knowledge/values**	**2**	**7**	

Oral and written tests	**Theoretical lectures discussion/**	**Means and methods of consolidating the values of professional ethics**	**Knowledge/values**	**2**	**8**
Oral and written tests	**Theoretical lectures discussion/**	**Professional ethics for business organizations**	**Knowledge/values**	**2**	**9**
Oral and written tests	**Theoretical lectures discussion/**	**Professional behavior and public office relations**	**Knowledge/values**	**2**	**10**
Oral and written tests	**Theoretical lectures discussion/**	**Effects of employment contracting**	**Knowledge/values**	**4**	**1+11 2**
Oral and written tests	**Theoretical lectures discussion/**	**Models of professional ethics according to administrative specializations**	**Knowledge/values**	**2**	**13**
Oral and written tests	**Theoretical lectures discussion/**	**Soft skills and hard skills**	**Knowledge/values**	**4**	**1+14 5**

Course evaluation	
The final evaluation for the student will be 100 points, distributed as follows : (40%) semester tests, (10%) participation and daily tests, and .final exam (%50)	
Learning and teaching resources	
ethics course prepared by a committee at the Middle Technical University	Required textbooks (methodology, if (any
	Main references (sources)
	Recommended supporting books and ,references (scientific journals (.... ,reports
	Electronic references, websites

:Arabic sources

,Abu Al-Khair, Muhammad Saeed (B.T): Guide to Professional Ethics .Faculty of Arts , Zagazig University

Federation of Arab Engineers (2018): Code of Ethics for the Engineering Profession, Arab Authority for Qualification and Accreditation of .Engineers

Ahmed, Hanan Marzouk Hussein (2004): Effectiveness program To develop some Value For morality For children , Streets message Ph.D not ,published university eye , sun .Egypt

,Ismail, Ezz El-Din (1974): Aesthetic Foundations in Arabic Criticism .Dar Al-Fikr Al-Arabi, Cairo

Al-Agha, and Samaa Hassan (2000): Abstract Realism in Contemporary .Iraqi Painting, House of General Cultural Affairs, Baghdad

Bert Yally, Jean (1986): Research in Aesthetics, translated by: Anwar , Abdel Aziz, reviewed by Nazmi Lofa, Al-Mustansiriya University Egyptian Press.

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Jassim, Nabil Abdel Razzaq (2013): Rules and Ethics for Practicing the Engineering Profession, Al-Basair House and Library for Publishing and .Distribution, Lebanon

Al-Jarisi , Khaled bin Abdul Rahman (2012: Management ethics from ,the Islamic and administrative perspective, King Fahd National Library .2nd edition, Riyadh

Jaafar, Nouri (B.T.): Thought, its nature and development, Al-Taqid .Library Publications, Al-Bab Al-Sharqi, 1st edition, Baghdad

Hassan, Hassan Muhammad (B.T): Contemporary artistic doctrines and .the plastic vision of the twentieth century, Dar Al-Fikr Al-Arabi Hassan, Abdul Mahdi Abdul-Rida (bt): Code of professional ethics for .nurses and midwives in Iraq, website www.uobabylon.edu.iq/eprints/pubdoc_10_6984_150.doc

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Darraji , Jabbar Slaves Kazem (2011: Ethics the job Administrative For managers in Ministries Iraqi From the point of consideration ,Staff doctoral thesis submitted to the University of St .Clements International

Rajeh, Abu Zaid (2017): The Egyptian Code of Ethics and Code of Conduct for Practice of the Engineering Profession and Penalties .Regulations, Permanent Committee of the Egyptian Code, Egypt .Rabhi, Israa (2018): The concept of bribery, website https://mawdoo3.com

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Riad, Abdel Fattah (1986): Training in Plastic Arts, Dar Al Nahda Al ,Arabiya, 1st edition, Abdel Khaleq Tharwat Street

.Mishal, Talal (2018): What is the importance of ethics , website https://mawdoo3.com/

Al-Mashharawi , Ahmed Hussein (2014): Role Ethics Occupation in Strengthen the responsibility Social In hospitals Governmental Palestinian (Complex Healing Medical Example), Master's thesis in Leadership programme And management, academic Administration And politics For studies Supreme By sharing with university ,Al-Aqsa .Palestine

Essaouira Technical Institute (2019): Description of the graduate of the .Department of Plant Production , website http://instituteofsuwaira.com/index.php?name=News&file=article&sid=80

Regional Office for the Eastern Mediterranean (2005): International .Islamic Code of Medical and Health Ethics , World Health Organization

) World Intellectual Property OrganizationWIPO Intellectual :(2019) (.Property, website
https://www.wipo.int/about-ip/ar/
Website (2019): Professional ethics in the agricultural field .the website , http://webcache.googleusercontent.com/search?q=cache:h8qR4RHcgR8J :ecee.asu.edu.eg/hr/agriculure/ethics-job-agriculure4.html&hl=ar&gl=iq&strip=1& vwsrc =0
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Quality Assurance Unit (2017): Professional Ethics Guide, Faculty of .Arabic Language, Al-Azhar University , Cairo
, Iraqi Ministry of Health (2018): Code of Medical Research Ethics .National Center for Training and Human Development
Iraqi Ministry of Health (2017): Principles of medical ethics in Iraqi .health institutions
Agency for Technical Affairs (2019): A guide to agricultural tasks and .work for the agricultural engineer and agricultural technician, website https://www.google.com/search?source=hp&ei=p4NnXb2DAtL8kwX3yK GQAg&q=
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Yaqoub, Wafa (2008): The basics of beekeeping as one of the pillars of developing the profession in the Syrian Arab country, the Second .Conference of Syrian Beekeepers, Nahla website http://www.na7la.com/mmmns2.html#c : Foreign sources
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Ibrahim SA, Hassan MA, Hamouda SI, Abdullah NM. (2017): Impact of patients' rights training sessions for nurses on perceptions of nurses and patients. Nurse Ethics. Nov; 24(7):856-867.
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Ziv A, Wolpe PR, Small SD, Glick S. (2006): Simulation-based medical education: an ethical imperative. Simul Healthc . Winter; 1(4):252-6.

1.Course Name
The crimes of the Baath regime in Iraq
2. Semester/year
Annual/ Second Year
3. Date Prepare this description
10/3/2024
4. Available forms of attendance
my class
5. Number of academic hours (total). Units (total)
One hour/one unit
6. Name of the course administrator (if more than one name is mentioned)
Name: Email:
7. Course objectives

To identify and learn about a group of crimes committed by the defunct and dissolved Baath Party against the Iraqi people and their various components, and to establish awareness among students to reject all forms of injustice and tyranny of these regimes and to demand all civil and political rights.	Objectives of the study subject
8. Teaching and learning strategies	
Giving lectures and using the method of discussion and dialogue	The strategy

9. Course structure

Evaluation method	Teaching method	Name of the unit or topic	Required learning outcomes	hours	the week
Question and Answer	Giving the lecture	Baath crimes according to the Iraqi Criminal Court law	The student learned about the Baath crimes according to the	One hour	1

			Iraqi Criminal Court law		
Question and Answer	**Giving the lecture**	**The concept of crimes and their types**	**To distinguish between the concept of crimes and their categories**	**One hour**	**2**
Question and Answer	**Giving the lecture**	**Definition of crime in language and terminology**	**To clarify the term and language to the student**	**One hour**	**3**
Question and Answer	**Giving the lecture**	**Crime departments**	**To learn about crime departments**	**One hour**	**4**
Question and Answer	**Giving the lecture And use the whiteboard**	**Types of international crimes**	**To learn about the types of international crimes**	**One hour**	**5**
Question and Answer	**Giving the lecture And use the whiteboard**	**Decisions issued by the criminal court**	**To learn about the decisions issued by the Criminal Court**	**One hour**	**6**
Question and Answer	**Giving the lecture**	**Psychological and social crimes and the most prominent violations of the Baath Party**	**To learn about psychological and social crimes and the most prominent violations of the Baath Party**	**One hour**	**7**
Question and Answer		**Psychological crimes**	**To identify psychological crimes**	**One hour**	**8**
Question and Answer	**Giving the lecture**	**Mechanisms of psychological crimes**	**To learn about the mechanisms**	**One hour**	**9**

	And use the whiteboard		**of psychological crimes**		
oral test	**Giving the lecture And use the whiteboard**	**Psychological effects of crimes**	**To identify the effects of psychological crimes**	**One hour**	**10**
Question and Answer	**Giving the lecture**	**Social crimes**	**To learn about social crimes**	**One hour**	**11**
Question and Answer	**Giving the lecture**	**Militarization of society**	**To clarify the concept of militarization of society**	**One hour**	**12**
Question and Answer	**Giving the lecture**	**The Baath position on religion**	**To learn about the Baath position on religion**	**One hour**	**13**
Question and Answer	**Giving the lecture And use the whiteboard**	**Violating Iraqi laws**	**To identify violations of Iraqi laws**	**One hour**	**14**
Written exam	**Giving the lecture**	**Pictures of human rights violations**	**To identify pictures of human rights violations**	**One hour**	**15**
Question and Answer	**Giving the lecture**	**Some decisions of political violations**	**To learn about some decisions of political violations**	**One hour**	**16**
Question and Answer	**Giving the lecture**	**Prison and detention places**	**To learn about prison and detention locations**	**One hour**	**17**

	And use the whiteboard				
Question and Answer	**Giving the lecture**	**Environmental crimes of the Baath regime**	**To learn about the environmental crimes of the Baath regime**	**One hour**	**18**
Question and Answer	**Giving the lecture**	**Military pollution**	**To learn about military pollution**	**One hour**	**19**
Question and Answer	**Giving the lecture**	**Destruction of cities and villages**	**To learn about the destruction of cities and villages**	**One hour**	**20**
Question and Answer	**Giving the lecture**	**Drying the marshes**	**To learn about drying marshes**	**One hour**	**21**
Question and Answer	**Giving the lecture**	**Dredging orchards**	**To learn about razing orchards**	**One hour**	**22**
Question and Answer	**Giving the lecture And use the whiteboard**	**Mass graves**	**To learn about mass graves**	**One hour**	**23**
Question and Answer	**Giving the lecture**	**Extermination cemeteries events**	**To learn about the events of extermination cemeteries**	**One hour**	**24**
oral test	**Giving the lecture**	**Symbolic classification of extermination graves**	**To learn about the symbolic classification of extermination graves**	**One hour**	**25**
View only	**Giving the lecture**	**View documents for genocide crimes**	**To learn about presenting**	**One hour**	**26**

			documents for genocide crimes		
View only	Videographer presentation	View criminal court decisions	To learn about the presentation of criminal court decisions	One hour	27
View only	Videographer presentation	The accusations leveled against Saddam and his aides	To learn about the accusations leveled against Saddam and his aides	One hour	28
View only	Videographer presentation	Show photographic documents of crimes	Watch and display video documents of crimes	One hour	29
View only	Videographer presentation	Show photographic documents of crimes	Watch and display video documents of crimes	One hour	30

10. TqYYum the decision

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

11. Education and teaching resources

The crimes of the Baath regime in Iraq	**Required textbooks (methodology, if any)**
Archives of the Political Prisoners Foundationn	**Main references (sources)**
	Mainstream books and references recommended by scientific journals, Reports....)
	Electronic references, Internet sites