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

Oil and Gas Equipment Program, Academic Program Course Description

2024

Introduction:

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

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

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

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

Concepts and terminology:

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

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

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

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

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

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

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

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are

followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: University of Technology
Faculty/Institute: Electromechanical Eng. Dept.
Scientific Department: Oil and Gas Equipment Engineering
Academic or Professional Program Name: Oil and Gas Equipment Engineering
Final Certificate Name: Electromechanical Eng./ Oil and Gas Equipment Engineering
Academic System: Engineering
Description Preparation Date: 6/2/2024
File Completion Date: 6/3/2024

Signature:
Head of Department Name:

Date:

Signature:
Scientific Associate Name:

Date:

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

Approval of the Dean

1. Department Vision

Aiming to build an engineering establishment in the Electromechanical field to be an outstanding one among the top international universities.

2. Department Mission

Preparing an Electromechanical specialist having an outstanding knowledge level, keeping up with the rapid developed trends in this field and complying with the professional moral conduct in serving the work sectors and society.

3. Department Objectives

- Graduating engineers are highly qualified in the Electromechanical field, capable of developing their skills in the engineering knowledge aspects, able to utilize this in the specialized Electromechanical application and mastering the design and implementation of all devices related to this discipline.
- Feeding the society with the specialists, experts and scientific consultants in Electromechanical engineering field.
- Supporting the research scientific center and engineering industrial projects by the highly capable specialists in their fields.
- Strengthening the relation with local and international engineering and scientific establishments.

4. Program (Oil and Gas Equipment) Mission

1- Prepare our students for successful careers in the Oil and Gas Equipment profession,
2- Conduct high quality and innovative research, and
3- Serve the community and industry providing educational and research resources.

5. Program Accreditation

6. Other external influences

There is no sponsor for the program

7. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	16	0.10	Basic
College Requirements	16	56	0.36	Basic
Department Requirements	31	82	0.54	Basic
Summer Training	yes	–	–	–
Other		–	–	–

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

8. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
2024			theoretical	practical
1st Year, 1st Semester	WSHE106	Workshops I	-	2
1st Year, 1st Semester	DEHR105	Democracy and human rights	2	-
1st Year, 1st Semester	ENME115	Engineering Mechanics	2	2
1st Year, 1st Semester	MATH113	Mathematics I	4	-
1st Year, 1st Semester	CHEM114	Chemistry	4	-
1st Year, 1st Semester	COSC108	Computer Science I	1	2
1st Year, 1st Semester	MSEN117	Materials Science & Engineering	2	-
1st Year, 2nd Semester	ENLA103	English Language I	2	-
1st Year, 2nd Semester	WOSH105	Workshops II	-	2
1st Year, 2nd Semester	MATH122	Mathematics II	4	-
1st Year, 2nd Semester	PHYS123	Physics II	4	-
1st Year, 2nd Semester	FUEE124	Fundamentals of Electrical Engineering (AC + DC)	2	2
1st Year, 2nd Semester	PEEN 126	Principles of Equipment Engineering	2	-
1st Year, 2nd Semester	FATD125	Fundamentals of AutoCAD tools Drawing	-	3
2nd Year, 1st Semester	UOT201	The crimes of The Baath regime in Iraq	2	-
2nd Year, 1st Semester	EMOG202	Advanced Mathematics I	4	-
2nd Year, 1st Semester	EMOG204	Drilling Systems	2	-

2nd Year, 1st Semester	EMOG205	Electrical Machines (AC & DC)	2	2
2nd Year, 1st Semester	EMOG206	Thermodynamics	2	2
2nd Year, 1st Semester	EMOG208	Electrical and Electronic Circuits	2	2
2nd Year, 1st Semester	EMOG211	Measurement & Instrument	2	2
2nd Year, 2nd Semester	UOT200	English Language	2	–
2nd Year, 2nd Semester	EMOG203	Advanced Mathematics II	4	–
2nd Year, 2nd Semester	EMOG212	Petroleum and Natural Gas production and Reservoir Systems	2	2
2nd Year, 2nd Semester	EMOG207	Fluid Mechanics	2	2
2nd Year, 2nd Semester	EMOG213	Corrosion Engineering	2	-
2nd Year, 2nd Semester	EMOG210	Strength of Materials	2	2
2nd Year, 2nd Semester	EMOG209	Digital Electronics	2	2
3rd Year, 1st Semester	EMOG301	Engineering Analysis	4	–
3rd Year, 1st Semester	EMOG312	Natural Gas Compression Systems	2	-
3rd Year, 1st Semester	EMOG304	Microprocessor and Microcontroller	2	2
3rd Year, 1st Semester	EMOG305	Control Systems	2	2
3rd Year, 1st Semester	EMOG311	Pressure Vessel and pipes Design	2	-
3rd Year, 1st Semester	EMOG307	Heat & Mass Transfer	2	2
3rd Year, 1st Semester	EMOG303	C++ programming	2	2
3rd Year, 2nd Semester	EMOG302	Numerical Analysis	4	–
3rd Year, 2nd Semester	EMOG313	Oil and Gas Transmission Systems	2	-
3rd Year, 2nd Semester	EMOG310	Digital Signals Processing	2	–
3rd Year, 2nd Semester	EMOG314	Fire and Explosion Control Systems	2	-
3rd Year, 2nd Semester	EMOG308	Machine Theory and Vibration	2	2
3rd Year, 2nd Semester	EMOG306	Tribology	2	-
3rd Year, 2nd Semester	EMOG309	Engineering Statistics and Optimization	2	2
4th Year, 1st Semester	UOT400	Engineering Ethics	2	–
4th Year, 1st Semester	EMOG401	Design of Gas and Oil Equipment	2	-
4th Year, 1st Semester	EMOG405	Hydraulic Systems	2	2
4th Year, 1st Semester	EMOG409	Pollution Control in Oil and Gas Industry	2	-
4th Year, 1st Semester	EMOG410	Industrial Engineering	2	-
4th Year, 1st Semester	EMOG407	Automation and Intelligent systems	2	-

4th Year, 2nd Semester	EMOG412	Safety and Reliability Engineering	2	–
4th Year, 2nd Semester	EMOG402	Computer aided Design and Manufacturing (CAD& CAM)	2	2
4th Year, 2nd Semester	EMOG404	Electric drives	2	-
4th Year, 2nd Semester	EMOG411	Hydrocarbon Flow Assurance Systems	2	2
4th Year, 2nd Semester	EMOG408	Economics of Oil and Gas Industry	2	-
4th Year, 2nd Semester	EMOG403	Maintenance of Equipment	2	-
4th Year, 2nd Semester	EMOG406	Project	-	4

9. Expected learning outcomes of the program

Graduate Outcomes (GOs) for engineering,

1. An ability to identify, formulate, and solve engineering in oil and gas equipment engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply the engineering design process to produce solutions that meet specified needs with consideration for public health and safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline.
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
4. An ability to communicate effectively with a range of audiences
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
6. An ability to recognize the ongoing need to acquire new knowledge, to choose appropriate learning strategies, and to apply this knowledge.
7. An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment.

Knowledge	
Learning Outcomes (GO1)	An ability to identify, formulate, and solve engineering in oil and gas equipment engineering problems by applying principles of engineering, science, and mathematics.
Learning Outcomes (GO2)	An ability to apply the engineering design process to produce solutions that meet specified needs with consideration for public health and safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline.
Learning Outcomes (GO3)	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
Learning Outcomes (GO6)	An ability to recognize the ongoing need to acquire new

	knowledge, to choose appropriate learning strategies, and to apply this knowledge.
Skills	
Learning Outcomes (GO4)	An ability to communicate effectively with a range of audiences
Learning Outcomes (GO7)	An ability to function effectively as a member or leader of a team that establishes goals, plans tasks, meets deadlines, and creates a collaborative and inclusive environment.
Ethics	
Learning Outcomes (GO5)	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

10. Teaching and Learning Strategies

Problem Based Learning (PBL) is the new teaching and learning strategies and it is adopted in the implementation of the program in general.

11. Evaluation methods

With lab,
Mid exam 15%, student activities 15%, lab 10%, final exam 60%.
Without lab,
Mid exam 15%, student activities 15%, final exam 70%.

12. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor (1)	Chemical Eng.	Fluid Flow				
Professor (2)	Mechanical Eng.	thermal	–	–	–	–
Professor (2)	Mechanical Eng.	applied	–	–	–	–
Prof. Assistance (2)	Mechanical Eng.	thermal	–	–	–	–

Prof. Assistance (4)	Mechanical Eng.	applied	–	–		–
Lecturer (1)	Mechanical Eng.	applied				
Lecturer (3)	Mechanical Eng.	thermal		–	–	–
Prof. assistance (1)	Electrical Eng.	power	–	–	–	–
Prof. assistance (2)	Electrical Eng.	Electronic				
Lecturer (1)	Electrical Eng.	power	–	–	–	–
Lecturer (1)	Electrical Eng.	Electronic	–	–	–	–

Professional Development

Mentoring new faculty members

The scientific committee in the department mentors the new faculty by:

1- Enter the class with previous two faculty for two months as observer.

2- Enter a period of training in continuous education center in the university for a month.

3- Mentor by the chair of the branch in the first year.

Professional development of faculty members

The scientific committee in the department have a plan for developing the faculty:

1- Periodically scientific lecture by one of the staff on developing in his professional field for all faculty.

2- Periodically lecture in social field for all faculty and students.

3- Yearly conference in the department with contributions from all faculty (2020, 2021, 2022 and 2023).

4- Contribution in conferences in different universities inside and outside Iraq.

5- Contribution in publishing papers in local, regional and international journals (Scopus and Science Direct).

6- Participates in different committees in university and ministry.

7- Participates in American developing faculty origination (IREX).

8- Participate all faculty in workshop for Problem Based Learning (new teaching method).

9- All Faculty contribute in getting the accreditation from ICAEE, so the faculty became a professional in accreditation process.

13. Acceptance Criterion

Usually, central enrollment was carried by ministry of higher education based on degree, professional field, location, university requirements.

14. The most important sources of information about the program

The program of Oil and Gas Equipment Engineering is designed to provide students with a comprehensive understanding of the engineering principles and practices relevant to the oil and gas industry. The curriculum covers a wide range of topics related to the design, operation, maintenance, and management of equipment used in the exploration, production, refining, and distribution of oil and gas. Courses typically include subjects such as fluid mechanics, thermodynamics, drilling engineering, reservoir engineering, pipeline engineering, corrosion control, safety engineering, and project management. Students learn how to apply engineering principles to design efficient and reliable equipment, optimize processes, and ensure safety and environmental sustainability. Graduates of the program are well-equipped to pursue careers in various sectors of the oil and gas industry, including upstream exploration and production, downstream refining and processing, pipeline transportation, energy consulting, and environmental engineering. The Oil and Gas Equipment Engineering BSc program prepares students to become versatile engineers capable of addressing the evolving needs and challenges of the global oil and gas industry. It provides a solid foundation in engineering principles, practical skills, and industry knowledge to support their professional growth and success.

15. Program Development Plan

The development plan for a Bachelor of Science (BSc) program in Oil and Gas Equipment Engineering involves strategic initiatives aimed at enhancing the quality, relevance, and effectiveness of the program. Update course offerings and introduce new courses to reflect the latest advancements, emerging trends, and industry demands in oil and gas equipment engineering. Integrate emerging technologies such as artificial intelligence, machine learning, and virtual reality into the curriculum to prepare students for future challenges and opportunities in the rapidly evolving oil and gas industry.

Program Skills Outline										
				Required program Learning outcomes						
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills		Ethics
				GO1	GO2	GO3	GO6	GO4	GO7	GO5
1st Year	MATH113	Mathematics I		*						
	MATH122	Mathematics II		*						
	CHEM 114	Chemistry							*	
	PHYS123	Physics							*	
	FUEE124	Fundamental of Electrical Engineering		*						
	ENME115	Engineering Mechanics					*			
	MSEN117	Materials Science & Engineering		*						
	FATD125	Fundamental of Auto CAD					*			
2nd Year	EMOG202	Advanced Mathematics I		*						
	EMOG203	Advanced Mathematics II					*			
	EMOG205	Electrical Machines		*						

	EMOG204	Drilling Systems		*						
	EMOG207	Fluid Mechanics		*						
	EMOG208	Electronic Circuits				*				
	EMOG213	Corrosion Engineering				*				
	EMOG210	Strength of Materials			*					
	UOT200	English Language						*		
3rd Year	EMOG302	Numerical Analysis		*						
	EMOG301	Engineering Analysis		*						
	EMOG303	C++ programming					*			
	EMOG305	Control Systems		*						
	EMOG311	Pressure Vessel and pipes Design		*						
	EMOG307	Heat & Mass Transfer		*						
	EMOG306	Tribology		*						
	EMOG310	Digital Signals Processing					*			
	EMOG312	Natural Gas Compression Systems		*						
	EMOG313	Oil and Gas Transmission Systems		*						
	EMOG308	Machine Theory and Vibration		*	*					

4th Year	UOT400	Engineering Ethics								*
	EMOG406	Project						*	*	
	EMOG410	Industrial Engineering				*				
	EMOG407	Automation and Intelligent systems		*						
	EMOG409	Pollution Control in Oil and Gas Industry		*						
	EMOG403	Maintenance of Equipment		*	*					
	EMOG405	Hydraulic Systems		*						
	EMOG411	Hydrocarbon Flow Assurance Systems			*					
	EMOG401	Design of Gas and Oil Equipment			*					
	EMOG412	Safety and Reliability Engineering				*				
	EMOG402	Computer aided Design and Manufacturing (CAD& CAM)			*					
	EMOG404	Electric drives				*				

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

Course Description Forms

Second Year

1. Course Name:
English Language II
2. Course Code:
UOT200
3. Semester / Year:
Second semester/ Second stage
4. Description Preparation Date:
4/2/2024
5. Available Attendance Forms:
Mandatory class attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours/ 2 units
7. Course administrator's name (mention all, if more than one name)
Name: Name: Assist. Lec. Ahmed Imad Jawad Email: Ahmed.I.Jawad@uotechnology.edu.iq
8. Course Objectives

Course Objectives	• focusing on understand the language and how to use it in a daily basis for the second stage students • Encouraging the students to use English in class conversation • Introduce them with new vocabulary • Focusing on the grammar and understand the differences between tenses and how to use them correctly
9. Teaching and Learning Strategies	
Strategy	The lecture strategy was adopted as a teaching method that includ a discussion points about grammar and encouraging the Students to learn how to use the language in their daily events and how to apply it, as well as emphasizing listening For English speakers and encouraging the student to read, speak, and use scientific vocabulary.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	2	Introduction to the importance of communication and learning the English language	Introduction	Lecture	Quiz & Daily assessment

Week 2	2	Learn how to introduce yourself	Getting to know you	Lecture	Quiz & Daily assessment
Week 3	2	Learn about how to talk about what you like	Whatever makes you happy	Lecture	Quiz & Daily assessment
Week 4	2	Learn to talk about daily news and events	What's in the news	Lecture	Quiz & Daily assessment
Week 5	2	Learn how to use the food and drinks vocabulary	Eat, drink, and be merry	Lecture	Quiz & Daily assessment
Week 6	2	Learn to talk about future plans and goals	Looking forward	Lecture	Quiz & Daily assessment
Week 7	2		Exam 1		Midterm Exam
Week 8	2	Learn how to express the past	Living history	Lecture	Quiz & Daily assessment
Week 9	2	Learn about each gender vocabulary	Girls and boys	Lecture	Quiz & Daily assessment
Week 10	2	Learn about How to read stories	Time for story	Lecture	Quiz & Daily assessment
Week 11	2	Learn communication methods and tools	Our interactive world	Lecture	Quiz & Daily assessment
Week 12	2	Learn about how to make a decision	Life's what you make	Lecture	Quiz & Daily assessment
Week 13	2	Learn about how to express your wonderings	Just wondering	Lecture	Quiz & Daily assessment
Week 14	2		Exam 2		Midterm Exam
Week 15	2	Review and each group of students have to do a presentation	Presentation project	The Lecture	Quiz & Daily assessment

11. Course Evaluation

- Midterm exam, 10 marks
- Quizzes, 5 marks
- Daily evaluation of actual participation in the class and discussions + homework, 10 marks
- Daily attendance, 5 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	New Headway Pre-Intermediate Fourth Edit student's book New Headway Pre-Intermediate Fourth Edition workbook
Main references (sources)	-
Recommended books and references (scientific journals, reports…)	-
Electronic References, Websites	Pre-Intermediate Fourth Edition | Headway Student's Si Oxford University Press (oup.com)

1. Course Name:
Corrosion engineering
2. Course Code:
EMOG213
3. Semester / Year:
Second semester 2024
4. Description Preparation Date:
8/2/2024
5. Available Attendance Forms:
In-person lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
48 h/48u
7. Course administrator's name (mention all, if more than one name)
Name: Asifa Mohammed Email: 50009 @uotechnology.edu.iq

8. Course Objectives	
Course Objectives	**1. The student acquires a cognitive skill in metal corrosion engineering** **2. Gains an understanding of the types of corrosion and forms of corrosion** **3. It can treat and solve corrosion problems anywhere** **4. The student acquires skill in calculating and measuring the corrosion rate** **5. The student acquires a cognitive and practical skill in estimating the time of metal collapse due to corrosion** **6.The student can address the problems of corrosion of oil and gas transportation pipelines** **7. Acquires skill in the role of paint in eliminating corrosion of metal parts found in oil transport pipelines and industrial facilities.**

9. Teaching and Learning Strategies	
Strategy	Active learning strategies Teamwork strategy Discussion strategy

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning metho	Evaluation method
1	2	Understand the basics of eating	Meaning of corrosion	a lecture	Discussion
2	2	Study of types of corrosion	Types of corrosion	Lecture	sharing
3	2	Recognizes the acquisition of various forms of corrosion	Study of forms of corrosion	a lecture	Discussion
4	2	Recognizes the acquisition of various forms of corrosion	Complementary forms of corrosion	a lecture	sharing
5	2	Understanding the causes of metal erosion	Why do metals corrode?	a lecture	sharing
6	2	As a result of surface failure due to corrosion	Damage caused by surface failure due to corrosion	a lecture	sharing
7	2	General review with questions	General review with questions	Exam	Exam
8	2	Understands the meaning of iron rust and its chemical equations	Iron rust	Lecture and vid	Question and answer
9	2	Knowledge of active galvanic action	Galvanic cell	Lecture + video	Participation ar daily exam
10	2	Understand the meaning of anode, cathode and the different differences	Anode and cathode	a lecture	discussion
11	2	Skill in rate of eating rate	Types of corrosion rates	Lecture + exerc	Solve question
12	2	Food calculation	Types of corrosion rates	Lecture exercises	Solve question
13	2	Skill in making solutions to problems	Problems and exercises in calculating the corrosion rate	Lecture exercises	Duties
14	2	General review with questions	General review with questions	Exam	Exam
15	2	Exam	Exam	Exam	Exam

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	اساسيات هندسة التاكل 2018

Main references (sources)	corrosion of engineering materials
Recommended books and references (scientific journals, reports…)	كتاب كيمياء التاكل
Electronic References, Websites	file:///C:/Users/asus/Downloads/73043979-CORROSION-MaterialsAdvancedHnbk.pdf

1. Course Name:	
Electrical Machines (DC machines)	
2. Course Code:	
EMOG205	
3. Semester / Year:	
first semester/ second year	
4. Description Preparation Date:	
13/2/2024	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total):	
4 h	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Majida Khaleel Ahmed Email: 50234@uotechnology.edu.iq	
8. Course Objectives	
Course Objectives	By the end of this course the student will be able to • Describing the principle operation of DC generator and DC motor • Driving the EMF equation of dc generator. • Classify the DC generators. • Mathematically represent different types of DC generators. • Explain the characteristic of DC generator. • Driving toque equation for dc motor. • Mathematically represent different types of DC motor. • Explain the characteristic of DC motor. • Mention and explain speed control methods of the DC motors • Mention the main losses in the dc machine. • Calculate machine efficiency at different load conditions.
9. Teaching and Learning Strategies	
Strategy	Theoretical lectures (give the lecture to students in person) Practical lectures (work in the laboratory to achieve the practical aspect)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	2	Can define the electrical machine. classify the electrical machine. Mention the main parts of the dc electrical machines. Explain the principle operating of DC generator.	Construction of DC machine and operati principle of DC generator	Attendance lecture	Question and Answer
2nd	2	Drive EMF equation of dc generator and solved numerical problems related to this equation	EMF equation of dc generator	Attendance lecture	Homework
3rd	2	Explain the commutating process in DC machine. Define the armature reaction in dc machine. mention the main effect of the armature reaction.	Commutating in Dc machine. Armature reaction in DC machine.	Attendance lecture	Report
4th	2	Understand mathematical model for different types of Dc generators.	Classification of DC generators	Attendance lecture	Question and Answer
5th	2	Solved numerical problems related to mathematical models of DC generates	Numerical solved examples related to DC generator types	Attendance lecture	Homework
6th	2	What is voltage build up process in	Voltage build up process in dc	Attendance lecture	Question and Answer

		dc self-excited dc generator. Mention the main conditions for voltage build up in dc shunt generator	generator		
7th	2	Explain main characteristics of different types DC generators.	DC generators characteristics	Attendance lecture	report
8th	2	Solve numerical problems related to dc generator characteristics	Solved examples related to dc generator characteristics	Attendance lecture	Homework
9th	2	Midterm exam	Midterm exam	Attendance the exam	Editorial questions
10th	2	Understanding operating principle of dc motor. Drive torque equation for dc motor	Dc motor principle operating. Torque equation of dc motor	Attendance lecture	Question and Answer
11	2	Represent each type of dc motor by its equivalent circuit.	Types of DC motors	Attendance lecture	Question and Answer
12	2	Solved numerical problems related to the type of dc motor.	Solved examples of dc motor types.	Attendance lecture	Homework
13	2	Explain main characteristics of different types DC motors.	DC motors characteristics	Attendance lecture	Question and Answer
14	2	Explain the speed control methods of DC motor.	DC motor speed control	Attendance lecture	Quiz
15	2	Mention the losses in dc machine. Determine the dc	Losses in dc machine. solved examples for	Attendance lecture	Homework

		machine efficiency at different load conditions. Solve numerical problems related to dc machine losses	losses in dc machine.		

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	P. C. Sen, "Principles of electric machines a power electronics", John Willy and Sons I 1997
Recommended books and references (scientific journals, reports…)	S. J. Chapman, "Electric machin fundamentals", Mc. Graw Hill, 4th Edition, 201
Electronic References, Websites	

1. Course Name:

Strength of materials

2. Course Code:

EMOG210

3. Semester / Year:

Second Semester for The 2nd year 2023-2024

4. Description Preparation Date:

February 2nd 2024

5. Available Attendance Forms:

Attendance list

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

2 Theoretical +2practical /3 credit/

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

Name: Aseel Abdulbaky Abdulrazak
Email: aseel.a.abdulrazak@uotechnology.edu.iq

8. Course Objectives

Course Objectives	• Providing students with detailed information about types of stresses • Providing students with detailed information about bending street • The student can understand and derive theoretical equations for torsion complex stresses • Providing students with the ability to analyze the Mohr's circle and stresses in beams

9. Teaching and Learning Strategies

Strategy	• Boosting students' interest through interactive lesson delivery impro learning. • Improving teacher and students relationship improves learning. • Encouraging students to participate freely in lesson delivery improves stud learning. • Provision of efficient laboratories and workshops makes students to improv their learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. The majority of the lectures and homework of this course deal with the derivations and application of linear mathematics and engineering theory for circuit analysis	**Introduction and sim shear and thermal stress**	Lecture	Pop quiz
2	2	A,b,c	**Compound b subjected external load**	Lecture	Pop quiz
3	2	A,b,c	**SHEARING FORCE AND BENDING MOMENT DIAGRAMS**	Lecture	Pop quiz

4	2	a.b.c	**Relationship between shear fo Q, bending mon M and intensity loading W (kN/m**	Lecture	Written Quiz
5	2	A,b,c	**Simple tors theory**	Lecture	Class assignments
6	2	A, b,c,d	**- Composite shafts - series connection** **- Composite shaf parallel connecti**	Lecture	Class assignments
7	2	A, b,c,d	**- Simple bending theory** **- Section modulu**	Lecture	Class assignments
8	2	A, b,c,d	**- Second moment of area** **- Bending of composite or flitched beams** **Strain energy bending**	Lecture	1-hour e (comp)
9	2	A, b,c,d	**COMPLEX STRESSES**	Lecture	Class assignments
10	2	A, b,c,d	**Principal plane inclina in terms of the associa principal stress**	Lecture	Pop quiz
11	2	A, b,c,d	**Graphical solution - Mo stress circle with example**	Lecture	Pop quiz
12	2	A, b,c,d	**DEFLECTION OF BEA**	Lecture	Pop quiz
13	2	A, b,c,d	**Macaulay's method Macaulay's method uniformly distributed l (u.d.l)**	Lecture	Class assignments
14	2	A, b,c,d	**- Macaulay's method for beams with u.d.1. applied over part of the beam** **Examples**	Lecture	Discussion
15	2		Final Ex.		

11. Course Evaluation

Weekly pop quiz(10 marks) one-hour exams(10 marks), projects and assignments(20 marks), and the final exam(60 marks)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	NA
Main references (sources)	**1- E. J. HEARN ,Mechanics of Materials, 3rd**

	edition. **2- K. William, Strength of Materials** **3-R.C.Hibbeler, Statics and Mechanics of Materials.**
Recommended books and references (scientific journals, reports…)	Any book in the field
Electronic References, Websites	Educational video

1. Course Name:
The crimes of The Baath regime in Iraq
2. Course Code:
UOT201
3. Semester / Year:
First semester 2023-2024
4. Description Preparation Date:
2023
5. Available Attendance Forms:
in presence
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours/ 2 hours a week
7. Course administrator's name (mention all, if more than one name)

Name: Assi. Lect. Lamyaa Hussain Assi
Email: 50726@uotechnology.edu.iq

8. Course Objectives

Course Objectives	**• Making this generation aware of the crimes committed by the Baathist regime** **• The extent of human rights violations publicly** **• Spreading awareness of the extent of violatio of Sharia and law.....** • ..... • .....

9. Teaching and Learning Strategies

Strategy	Delivering theoretical lectures, opening the door to discussio participation, asking questions, and getting to know each oth The extent of human rights violations committed by the Baat regime in Iraq over a long period of time during which the Ira people suffered from the scourges of wars, mass graves...etc. One of the heinous crimes at the international level

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
First	2	Rejecting Baath	Concept of crim	Theoretical	Class activity
Second	2	thought in all	Effects of crimes	Theoretical	Quiz
Third	2	forms	Violations of law	Theoretical	Report
Fourth	2	Recognizing t	Violations	Theoretical	Midterms
Fifth	2	ugliness crim committed Violations committ	decisions Prison a detention places	Theoretical	
Sixth	2	For the sake		Theoretical	
Seventh	2	humanity	Environmental	Theoretical	
Eighth	2	Oppressing a	crimes	Theoretical	
Ninth	2	exterminating t	Destruction	Theoretical	
Tenth	2	people	cities and village	Theoretical	
Eleventh	2	Cruelty, intimidati	Mass grave crim	Theoretical	
Twelfth	2	and torture Politics of repressi	Genocide cemeteries even	Theoretical Theoretical	
Thirteen	2	Reject the idea c	The events of t	Theoretical	

Fourteen Fifteenth	2 2	change And expressing opinion Burying crime scen Killing a slaughtering t Shiite Kurds Concealing t evidence of crimes Continuous killing Hiding signs genocide Collective of t people	Shaabani uprisin Genocide cemeteries Kurdish cemeteries Cemeteries of t Shaabaniya Intifada Chronological classification Cemetery sites	Theoretical	

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

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	A methodological book (Crimes of t Baath Regime in Iraq)Ministry of High Education and Scientific Research
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
Electrical and Electronic Circuits
2. Course Code:
EMOG208
3. Semester / Year
One/2023-2024

4. Description Preparation Date:

5/2/2024

5. Available Attendance Forms:

attendance list

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

2 Theoretical +2practical /3

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

Name: Buraq Abdul Hadi Awad

Email: 50050@uotechnology.edu.iq

8. Course Objectives

Course Objectives	**1. Develop and understanding of the fundamental laws and elements of electrical circuits.** **2. Learn the energy properties of electric elements and the techniques to measure voltage current.** **3. Develop the ability to apply circuit analysis to DC and AC circuits**

9. Teaching and Learning Strategies

Strategy	• Boosting students' interest through interactive lesson delivery improves learning. • Improving teacher and students relationship improves learning. • Encouraging students to participate freely in lesson delivery improves students learnin • Provision of efficient laboratories and workshops makes students to improve in t learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2 3 4,5 6 7 8 9 10 11 12 13 14 15	2	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. The majority of the lectures and homework of this course deal with the derivations and application of linear mathematics and engineering theory for circuit analysis	• Bipolar Junction Transistor (BJT) Circuits**:** • BJT as an Amplifier • DC Biasing Circuits (Design, Analysis, and Stability)**.** • The BJT Inverter (Transistor as a Switch)**.** • Small-Signal BJT Amplifiers • BJT Modeling (hybrid and re)**.** • Graphical Determination of the h-Parameters ,Voltage Gain Power Gain and Current Gain, • Field-Effect Transistor (FET) Circuits: • Small-Signal FET • Amplifiers FET	Traditional education enhanced by examples from public life	Midterm exam 20% Quiz and other activities 20% Final exam 60%

			Modeling		

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1. **Thomas L. Floyd , "ELECTRONIC DEVICES" , Tenth Edition,2018** 2. **Charles K. Alexander , Matthew N. O. Sadiku, "Fundamental of Electric Circuits", fifth Edition, 2009.** 3. ياسين احمد الشبول ،"اللاكترونيات المعاصرة" ،الجزء الاول ، 2004
Main references (sources)	**Electric Circuits, 9th edition, J. Nilsson and S. Riedel, Prentice Hall, 2011**
Recommended books and references (scientific journals, reports…)	Any book in the field
Electronic References, Websites	Educational video

1. Course Name:
Thermodynamic **Fluid mechanics**
2. Course Code:
EMOG 206 **EMOG207**
3. Semester / Year:
First semester: thermodynamics **Second semester fluid mechanics**
4. Description Preparation Date:
2024/2/4
5. Available Attendance Forms:
Attendance weekly
6. Number of Credit Hours (Total) / Number of Units (Total)

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

Name: Prof. Dr. Khalid Faisal Sultan
Email: Khalid.f.sultan@uotechnology.edu.iq

8. Course Objectives

Course Objectives	**In this course, Thermodynamic** • **It provides a working knowledge of open system and closed system, Simple steam plant, Heat cycle of turbine plant and advanced steam plants as well as heat cycles of modern steam plants.** • **Illustration and discussion the principles of energy, work done, internal energy, 1st and 2nd law of thermodynamics as well as applications.** • **This unit of study aims to provide you with an understanding of the fundamentals of the thermodynamic** • **The ability to analyses existing flow and contribute to new designs.** **In this course, Fluid mechanics** • **Students will learn how to analyze the flow within the fluid machinery** • **To calculate force and power developed or consumed in additional to their efficiency. Topics include** • **Analysis and working principle for each machine.** • **Given a brief introduction to hydro-electrical power plants design.**

9. Teaching and Learning Strategies

Strategy	**Providing the student with experience in how the student acquires all the skills, including analysis and calculation of machine parts, steam and gas thermal energy, and hydroelectric machines, as well as classroom activities through asking questions, monthly, daily and quarterly examinations and discussions on the topic of scientific research, which is thermodynamics and fluid mechanics.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
15 **15**	**2** **2**	**The student acquires skills and knowledge in analyzing the types of flow and the operating principle of heat, steam, and gas machines and turbines.**	**Thermodynamic** **Fluid mechanics**	**Scientific and video lectures and discussions**	**Monthly exam** **Daily oral exam** **Semester exam**

11. Course Evaluation
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc **Monthly exam 20%** **Daily oral exam 10%** **Lab exam 10%** **Semester exam 60%**

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	**Fluid Mechanics: Streeter, Victor L., Wylie, E. Benjamin,2018**
Main references (sources)	• **Hydraulic machines including fluidics , Dr. Jag – sh. Lal, 2008** • **Fluid mechanics and hydraulic machines , R. K. Rajput, 2015**
Recommended books and references (scientific journals, reports…)	• **Journal of Fluid Mechanics Cambridge Core** • **Journal of Experiments in Fluid Mechanics** • **Journal of Fluid Mechanics** • **Journal of Thermodynamics & Catalysis.** • **Journal of Thermodynamics.** • **Journal of Non-Equilibrium Thermodynamics.**
Electronic References, Websites	

1. Course Name:
measurement and instruments
2. Course Code:
EMOG211
3. Semester / Year:
First/ 2023-2024
4. Description Preparation Date:
6/2/2024
5. Available Attendance Forms:

Theoretical lecture + laboratory
6. Number of Credit Hours (Total) / Number of Units (Total)
30 h/3units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Rasha Fahim Nadhim Email: rasha.f.nahdim@uotechnology.edu.iq
8. Course Objectives

Course Objectives	• **Definition of the measurement proc and units of measurement** • **Definition of measurement errors, t causes, and analysis** • **Study the basics of indicating devi and design ammeters and voltmeters** • **Study the types of bridges used measure resistance and impedance.** • **Study of Transducer and its types** • **Study digital measuring devices**

9. Teaching and Learning Strategies

Strategy	

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understand t definition measurement process The main parts measuring devic	Introduction measurement	Theoretical explanation	An oral a written t and given Duties
		Understand a analyze units measurement	Basic and deriv units measurement	Theoretical explanation problem solving	Written t and assignment

		Understanding a analyzing measurement errors	Measurement errors	Theoretical explanation problem solving	Written t and assignment
		Understanding a studying the bas of analog indicating measuring devices	Analogue measuring devic	Theoretical explanation problem solving	Written t and assignment
		Design of voltme and ammeter	Analogue curre and volta measuring devic	Theoretical explanation problem solving	Written t and assignment
		Understanding a analyzing bridg their types a applications	Bridges and th applications	Theoretical explanation problem solving	Written t and assignment
		Understanding a analyzing Transducer, types a applications	Transducer	Theoretical explanation problem solving	Written t and assignment
			Signal analysis		Written t

		Signal analysis understanding digital current a voltage measuri devices	digital devices	Theoretica explanatio problem solving	and assignment
		Understanding measuring devic for oil and g testing	Measuring devic for oil and g testing	Theoretica explanatio problem solving	Written t and assignment

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc
Exam score of 15 marks
Daily exam, 5 marks
Lab 10 degrees
Rating: 10 marks
Final exam 60 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1-Electronic measurement systems. U.A.Bakshi 2- Electrical instrument a measurement techniques.W.D.cooper
Recommended books and references (scientific journals, reports…)	Electronic and electri measurement and instrumentati J.BGupta
Electronic References, Websites	

1. Course Name:
Digital Electronic
2. Course Code:
EMOG209
3. Semester / Year:
Second / 2024
4. Description Preparation Date:
07/02/2024
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hour /3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Rafah Kareem Mahmood Email: 50150@uotechnology.edu.iq
8. Course Objectives

Course Objectives	• Identify the principles of digital systems, and how to deal with them in digital electronics. • Identifying Logic Gates and how to use them on electronic panels • Identify ways to reduce complex electronic components and simplify large electronic circuits using digital systems

9. Teaching and Learning Strategies	
Strategy	• Lectures are written on the board ,enrching and mathematical examples are solved • Solving questions and asking them to dialogue and answer on the board in front of the students to encourage them to understand and participate • Conduct daily exams to help them review topics Not forcing students to write and making it optional, which will reflect positively them and they will

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 2	Introduction to Digital concept	Digital and Analog meanings Binary Digits Introduction to basic logic operations	Attendance	Quizzes and homework's
2		Logic Gates	NOT gate OR and NOR gate AND and NAND gate EXCLUSIVE OR and EXCLUSIVE NOR gate	Attendance	Quizzes and homework's

3	2	Numberes Systems	Decimal numbers Binary numbers The weighting structure of Binary numbers	Attendance	Quizzes and homework's
4	2	Binary arithmetic	Addition, Subtraction, multiplication and Division	Attendance	Quizzes and homework's
5	2	Complements	1'S and 2'S complements of Binary numbers	Attendance	Quizzes and homework's
6	2	Hexadecimal Numbers and Octal numbers	Hexadecimal Conversions and arithmetic and Conversions among Numbers Systems	Attendance	Quizzes and homework's
7		Boolean Aljebra and Logic Simplification	Boolean aljebra operations and expressions and simplification	Attendance	Quizzes and homework's
8	2	Boolean Aljebra and Logic Simplification	Laws and Rules of Boolean Aljebra	Attendance	Quizzes and homework's
9	2	Mid course Exam	Mid course Exam	Attendance	Exam
10	2	Demorgan's Theorems	Demorgan's Theorems	Attendance	Quizzes and homework's
11	2	Boolean Analysis of Logic circuits		Attendance	Quizzes and homework's
12	2	Simplification using Boolean aljebra	Boolean expressions and Truth Tables	Attendance	Quizzes and homework's
13	2	Designing logic circuits	Drawing logic circuits using logic gates	Attendance	Quizzes and homework's
14	2	Karnaugh Map	Karnagh Map SOP Minimization and Karnag Map POS Minimazation	Attendance	Quizzes and homework's
15	2	Review	Review	Attendance	

11. Course Evaluation	
15% mid exam – 15% student activities –- 10% laboratory 60% final Exam	
12. Learning and Teaching Resources	
Required textbooks (curricular books, any)	• Digital Fundamentals by Thomas l. Floyed 11th edition • Digital Electronics Anil K. Maini
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Digital Fundamentals by Thomas l. Floyed
Electronic References, Websites	https://www.youtube.com/watch?v=YysQEuKQ5Hc

1. Course Name:
Advanced Mathematics
2. Course Code:
EMOG202
3. Semester / Year:
2nd / 2024
4. Description Preparation Date:
05-2024
5. Available Attendance Forms:
Attendance lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
4 hours weekly (60 hours in course) (Theoretical)/ 8 Units
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Prof. Dr. RAED ABBAS JESSAM Email: 50097@uotechnology.edu.iq

8. Course Objectives	
Course Objectives	• Teaching students different Math. Subjects. • Teach students the importance basics of the different Math subjects. • Teach students the main applications of the different Math. subjects on the other engineering sciences.

9. Teaching and Learning Strategies	
Strategy	Theoretical lectures (give the lecture to students in person) with question and answer and home work.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	4	Vectors (The basics – Vector Athematic).	Vectors.	Attendance lecture	Question and Answer
2nd	4	Dot products and its properties and applications.	Vectors.	Attendance lecture	Question and Answer
3rd	4	Cross products and its properties and applications	Vectors	Attendance lecture	Question and Answer
4th	4	Stocks Theorem	Vectors	Attendance lecture	Question and Answer

5th	4	Laplace Transformer (Basics)	Laplace Transformer	Attendance lecture	Question and Answer
6th	4	Inverse Laplace Transformer (Basics)	Laplace Transformer	Attendance lecture	Question and Answer
7th	4	Inverse Laplace Transformer (Applications)	Laplace Transformer	Attendance lecture	Question and Answer
8th	4	Step Function (Basics and applications)	Laplace Transformer	Attendance lecture	Question and Answer
9th	4	Solving the IVP with Laplace Transformer	Laplace Transformer	Attendance lecture	Editorial questions
10th	4	Fourier series (basics and applications)	Fourier series	Attendance lecture	Question and Answer
11	4	Even and Odd Functions	Fourier series	Attendance lecture	Question and Answer
12	4	Half Range Expansions	Fourier series	Attendance lecture	Question and Answer
13	4	Power Series (basics and applications)	Power Series	Attendance lecture	Question and Answer
14	4	Arithmetic and geometric series	Power Series	Attendance lecture	Question and Answer
15	4	Series of powers of natural numbers	Power Series	Attendance lecture	Question and Answer

11. Course Evaluation

15% Quizzes; attendance and class activity, 15% midterm exam; 70% final exam

12. Learning and Teaching Resources

Required textbo (curricular books, if any)	No
Main references (source	Calculus Volume one, 2017 by EDWIN "JED" HERMAN, UNIVERSITY OF WISCONSIN-STEVENS POINT GILBERT STRANG, MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Recommended books and references (scientific journals, reports…)	Calculus for Engineering Students: Fundamentals, Real Problems, and Computers (Mathematics in Science and Engineering)

Electronic Referenc Websites	https://www.amazon.com/Calculus-Engineering-Students-Fundamentals-Mathematics/dp/012817210X

1. Course Name:

Advanced Mathematics

2. Course Code:

EMOG203

3. Semester / Year:

2nd / 2024

4. Description Preparation Date:

05-2024

5. Available Attendance Forms:

Attendance lectures

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

4 hours weekly (60 hours in course) (Theoretical)/ 8 Units

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

Name: Asst. Prof. Dr. RAED ABBAS JESSAM
Email: 50097@uotechnology.edu.iq

8. Course Objectives

Course Objectives	• Teaching students different Math. Subjects. • Teach students the importance basics of the different Math subjects. • Teach students the main applications of the different Math. subjects on the other engineering sciences.

9. Teaching and Learning Strategies

Strategy	Theoretical lectures (give the lecture to students in person) with question and answer and home work.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	4	Vectors (The basics – Vector Athematic).	Vectors.	Attendance lecture	Question and Answer
2nd	4	Dot products and its properties and applications.	Vectors.	Attendance lecture	Question and Answer
3rd	4	Cross products and its properties and applications	Vectors	Attendance lecture	Question and Answer

4th	4	Stocks Theorem	Vectors	Attendance lecture	Question and Answer
5th	4	Laplace Transformer (Basics)	Laplace Transformer	Attendance lecture	Question and Answer
6th	4	Inverse Laplace Transformer (Basics)	Laplace Transformer	Attendance lecture	Question and Answer
7th	4	Inverse Laplace Transformer (Applications)	Laplace Transformer	Attendance lecture	Question and Answer
8th	4	Step Function (Basics and applications)	Laplace Transformer	Attendance lecture	Question and Answer
9th	4	Solving the IVP with Laplace Transformer	Laplace Transformer	Attendance lecture	Editorial questions
10th	4	Fourier series (basics and applications)	Fourier series	Attendance lecture	Question and Answer
11	4	Even and Odd Functions	Fourier series	Attendance lecture	Question and Answer
12	4	Half Range Expansions	Fourier series	Attendance lecture	Question and Answer
13	4	Power Series (basics and applications)	Power Series	Attendance lecture	Question and Answer
14	4	Arithmetic and geometric series	Power Series	Attendance lecture	Question and Answer
15	4	Series of powers of natural numbers	Power Series	Attendance lecture	

11. Course Evaluation

15% Quizzes; attendance and class activity, 15% midterm exam; 70% final exam

12. Learning and Teaching Resources

Required textbo (curricular books, if any)	No
Main references (source	Calculus Volume one, 2017 by EDWIN "JED" HERMAN, UNIVERSITY OF WISCONSIN-STEVENS POINT GILBERT STRANG, MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Recommended books and references (scientific journals,	Calculus for Engineering Students: Fundamentals, Real Problems, and Computers (Mathematics in Science and Engineering)

reports…)	
Electronic Referenc Websites	https://www.amazon.com/Calculus-Engineering-Students-Fundamentals-Mathematics/dp/012817210X

1. Course Name:	
Drilling Equipment	
2. Course Code:	
EMOG204	
3. Semester / Year:	
First Semester / Second Year	
4. Description Preparation Date:	
11-02-2024	
5. Available Attendance Forms:	
Present (in person)	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 Hours / 2 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Raheek Ismail Ibrahim Email: raheek.i.ibrahim@uotechnology.edu.iq	
8. Course Objectives	
Course Objectives	• **The objectives of this course is to familiarize the students with well drilling operations, string designs along with all related mathematics for optimization of mud circulating parameters up to completion.** • **This course will prepare the students to work as a drilling engineer in petroleum industry.** • **Introducing the student to the basic principles of drilling mechanisms in oil fields** • **Linking theoretical material and basic concepts to the mechanisms of drilling oil wells**
9. Teaching and Learning Strategies	
Strategy	• **Lectures: The theoretical and practical lectures will be presented throughout**

	the semester. • **Assignments: after the lectures, the assignment will be explained and given to students. It is expected to be done on weekly bases.** • **Quizzes: the contents of each lecture will be discussed during class for open question and answer to make sure every student will participate and active.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	• Analyze key features of various rig components, and use these descriptions in appropriate for design analysis and evaluations. • Analyze the rig operations and perform required calculations.	Crude oil introduction Origin of crude oil Crude oil classification Crude oil properties Oil fields introduction Types of oil fields Gas fields Types of drilling systems Drilling system components Mechanical components Electrical devices Measuring devices Safety equipment Pressure drop introduction Pressure drop in oil fields Pressure drop calculations Enhanced oil recovery	• Lectures • Projects • Discussion	• Homework • Project assignments • Mid-term exa • Final exam

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Drilling Engineering, by G. Robello Samuel, PennWell Publishing Company, Tulsa, OK, 2007
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
Petroleum and Natural Gas Production and Reservoir Systems
2. Course Code:
EMOG212
3. Semester / Year:
Second Semester / Second Year
4. Description Preparation Date:
11-02-2024
5. Available Attendance Forms:
Present (in person)
6. Number of Credit Hours / Number of Units (Total)
4 Hours / 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Raheek Ismail Ibrahim Email: raheek.i.ibrahim@uotechnology.edu.iq
8. Course Objectives

Course Objectives	• **The objective of this course is to develop a deeper understanding of how pipelines really work.** • **This course will serve the need for a single source of learning for petroleum engineering students to enter the business and industry in pipeline engineering companies and departments.**
9. Teaching and Learning Strategies	
Strategy	• **Lectures: The theoretical and practical lectures will be presented throughout the semester; the discussion of practical work within lab will be organized and illustrated with activities.** • **Assignments: after the lectures, the assignment will be explained and given to students. It is expected to be done on weekly bases.** • **Quizzes: the contents of each lecture will be discussed during class for open question and answer to make sure every student will participate and active.**
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	• Design storage and terminal designs for crude oil. • Learn various liquid measurement techniques.	Storage systems introductio Storage tanks Types of storage tanks Oil Storage tanks introducti Open top tanks Fixed roof Floating roof Tanks design introduction Types of design standards Standard API 650 Standard API 653 Standard API 620 Tanks sealing system Drain system Ventilation system design Pressure calculations	• Lectures • Projects • Discussion	• Homework • Project assignments • Mid-term exar • Final exam

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Hydrocarbon liquid transmission pipeline a storage systems: design and operation by Mohitpour, M.S. Yoon, J.H. Russell, 2012.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Third Year

Course Description Form

1. Course Name:	
Engineering Analysis	
2. Course Code:	
EMOG301	
3. Semester / Year:	
First Semester/ Third year	
4. Description Preparation Date:	
4/2/2024	
5. Available Attendance Forms:	
Mandatory class attendance	
6. Number of Credit Hours (Total) / Number of Units (Total)	
60 hours/ 4 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Prof. Dr. Raed Naeem Hwayyin Email: 10596@uotechnology.edu.iq	
8. Course Objectives	
Course Objective	• Recognize the definition and solve the periodic function • Learn the rules to solve Fourier series periodic 2π. • Learn the rules to solve Fourier series periodic by general Form. • Learn the rules to solve Fourier Integral • Learn the rules to solve Complex Fourier Series • Learn the rules to solve Fourier Transform functions • Learn the rules to solve Some special functions • Learn the rules to solve Complex analysis: Functions of a complex variable • Learn the rules to solve Complex mapping • Learn the rules to solve Power series solutions of Ordinary differential equation • Learn the rules to solve Bessel and Legendre functions • of differential Equation • Learn the rules to solve Partial differential equations • Learn the rules to solve Laplace Equation (Heat Flow Equation) • Learn the rules to solve Gamma functions • Learn the rules to solve Beta functions
9. Teaching and Learning Strategies	
Strategy	• The lecture strategy is adopted as a teaching method and includes a discussion point on how to solve the examples, as well as assigning students to complete homework assignments after the

	end of each topic. • Students are asked to prepare a report on real-life applicatic based on one of the topics covered in the course curriculum.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week 1	4	Able to recognize the definition and solve the periodic function	Definition - Periodic Function	The Lecture	**Quizzes, Assignments, Report**
Week 2	4	Able to solve Fourier series periodic 2π.	Fourier series periodic 2π	The Lecture	**Quizzes, Assignments, Report**
Week 3	4	Able to solve Fourier series periodic by general Form.	Fourier series periodic (General Form)	The Lecture	**Quizzes, Assignments, Report**
Week 4	4	Able to solve Fourier Integral	Fourier Integral	The Lecture	**Quizzes, Assignments, Report**
Week 5	4	Able to solve Complex Fourier Series	Complex Fourier Series	The Lecture	**Quizzes, Assignments, Report**
Week 6	4	Able to solve Fourier Transform functions	Fourier Transform functions	The Lecture	**Quizzes, Assignments, Report**
Week 7	4	Able to solve Some special functions	Some special functions	The Lecture	**Quizzes, Assignments, Report**
Week 8	4	Able to solve Complex analysis: Functions of a complex variable	Complex analysis : Functions of complex variable	The Lecture	**Quizzes, Assignments, Report**
Week 9	4	Able to solve Complex mapping	Complex mapping	The Lecture	**Quizzes, Assignments, Report**
Week 10	4	Able to solve Power series solutions of Ordinary differential equation	Power series solutions of Ordinary differential equation	The Lecture	**Quizzes, Assignments, Report**
Week 11	4	Able to solve Bessel and Legendre functions of differential Equation	Bessel & Legendre functions of differential Equation	The Lecture	**Quizzes, Assignments, Report**
Week 12	4	Able to solve Partial differential equations	Partial differential equations	The Lecture	**Quizzes, Assignments, Report**
Week 13	4	Able to solve Laplace Equation (Heat Flow Equation)	Laplace Equation (Heat Flow Equation)	The Lecture	**Quizzes, Assignments, Report**
Week 14	4	Able to solve Gamma functions	Gamma functions	The Lecture	**Quizzes, Assignments, Report**
Week 15	4	Able to solve Beta functions	Beta functions	The Lecture	**Quizzes, Assignments, Report**

11. Course Evaluation

- **Midterm Exam : 10 Marks**
- **Report : 10 Marks**
- **Assignments : 5 Marks**
- **Quizzes : 5 Marks**

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Erwin Kreyszig , Herbert Kreyszig And Edward J. Norminton , Advanced Engineering Mathematics, JOHN WILEY & SONS, INC., 2011.
Main references (sources)	Erwin Kreyszig , Herbert Kreyszig And Edward J. Norminton , Advanced Engineering Mathematics, JOHN WILEY & SONS, INC., 2011.
Recommended books and references (scientific journals, reports…)	Chiang C. Mei , Mathematical Analysis in Engineering: How to Use the Basic Tools, Cambridge University Press; Revised edition (January 13, 1997)
Electronic References, Websites	https://www.cambridge.org/iq/universitypress/subjects/engineering/engineering-mathematics-and-programming/mathematical-analysis-engineering-how-use-basic-tools?format=PB

Course Description Form

1. Course Name:	
Control systems	
2. Course Code:	
EMOG305	
3. Semester / Year:	
2nd Semester /3th Year	
4. Description Preparation Date:	
4th Feb 2024	
5. Available Attendance Forms:	
Face to Face	
6. Number of Credit Hours (Total) / Number of Units (Total)	
32 hours through one semester /2 Units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Aseel .J.Mohammed Email: Aseel.J.mohammed@uotechnology.edu.iq	
8. Course Objectives	
Course Objectives	• Introduce the student to control systems (continuous control organizations and digital control systems) • Introduce the student to the types of control systems (open circuit and closed circuit). • Design and calculation of the stability of the system from a distance calculated the transition function. • Graduating engineers with competence, skill and knowledge in the design of the mass chart

9. Teaching and Learning Strategies

Strategy	1- Provide the student with theoretical lectures. 2- Provide the student with different problems and introduce him the mechanism for solving them.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Add educational outcomes	Mathematics background	Giving lectures	Students' interaction with the lecture
2	2	Add educational outcomes	Differential equation review	Giving lectures	Students' interaction with the lecture
3	2	Add educational outcomes	Conception of Transfer function	Giving lectures	Students' interaction with the lecture
4	2	Add educational outcomes	Open and close loop transfer function	Giving lectures	Students' interaction with the lecture
5	2	Add educational outcomes	Transfer function for some physic systems	Giving lectures	Students' interaction with the lecture
6	2	Add educational outcomes	Grounded chair representation	Giving lectures	Students' interaction with the lecture
7	2	Add educational outcomes	Instructions of block diagram reduction	Open discussions between the student and the lecturer	Giving the student an incentive reward (grades) and urging him to excel
8	2	1st Examination			
9	2	Add educational outcomes	Signal flow graph scheme and Mison formula	Giving lectures	Students' interaction with the lecture
10	2	Add educational outcomes	Time response analysis	Open discussions between the student and the lecturer	Giving the student an incentive reward (grades) and urging him to excel
11	2	Add educational outcomes	Specification of transient and steady state response	Open discussions between the student and the lecturer	Giving the student an incentive reward (grades) and urging him to excel
12	2	Add educational outcomes	Steady State Error	Giving lectures	Students' interaction with the lecture
13	2	Add educational outcomes	Routh Criterion method for stability	Giving lectures	Students' interaction with the lecture
14	2	Add educational outcomes	Bod plot analysis for stability	Giving lectures	Students' interaction with the lecture
15	2	Add educational outcomes	Life cycle analysis	Giving lectures	Students' interaction with the lecture
16	2	2nd Examination			

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

Course Description Form

1. Course Name:
Theory of machine and vibration
2. Course Code:
EMOG308
3. Semester / Year:
Second Semester for The 3rd year 2023-2024
4. Description Preparation Date:
February 2nd 2024
5. Available Attendance Forms:
Attendances list: Theoretical lecture: 2 hr/w Attendances list :Practical lecture: 2 hr/w
6. Number of Credit Hours (Total) / Number of Units (Total)
Theoretical lecture: 2 hr/w Practical lecture: 2 hr/w / 3 credit/
7. Course administrator's name (mention all, if more than one name)
Name: Aseel Abdulbaky Abdulrazak Email: aseel.a.abdulrazak@uotechnology.edu.iq Aseel.A.Abdulrazak@uotechnology.edu.iq
8. Course Objectives

Course Objectives	• Providing students with detailed information about vibration and elements • Providing students with detailed information about degree of freedom • The student can understand and derive theoretical equations to t solutions related to the final displacement of any system • Providing students with the ability to analyze the results obtained, con the systems, and find appropriate engineering designs for any system

9. Teaching and Learning Strategies

Strategy	• Boosting students' interest through interactive lesson delivery improves learning • Improving teacher and students relationship improves learning. • Encouraging students to participate freely in lesson delivery improves stude learning. • Provision of efficient laboratories and workshops makes students to improve their learning.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2h	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. The majority of the lectures and homework of this course deal with the derivations and application of linear mathematics and engineering theory for vibrations	**Introduction, vibration elements**	Lecture	Pop quiz
2	2h	A,b,c	**Free vibration without damping**	Lecture	Pop quiz
3	2h	A,b,c	**-Method of solution** **-Newton's Method** **-Energy method**	Lecture	Pop quiz
4	2h	a.b.c	**-Free vibration with damping** **-Examples**	Lecture	Written Quiz
5	2h	A,b,c	**-Logarithmic decrement** **-Examples**	Lecture	Class assignments
6	2h	A, b,c,d	**- Forced vibration** **- Harmonically exited forc**	Lecture	Class assignments
7	2h	A, b,c,d	**- Study state response** **- Magnification factor**	Lecture	Class assignments
8	2h	A, b,c,d	**Mid exam**	Lecture	1-hour exam (com
9	2h	A, b,c,d	**-Control the force vibration**	Lecture	Class assignments

10	2h	A, b,c,d	**Application about force vibration and control**	Lecture	Pop quiz
11	2h	A, b,c,d	**- Two degree of freedom system**	Lecture	Pop quiz
12	2h	A, b,c,d	**-Two degree of freedom system with force vibratio**	Lecture	Pop quiz
13	2h	A, b,c,d	**- Two degree of freedom system with force vibratio**	Lecture	Class assignments
14	2h	A, b,c,d	**Numerical solution**	Lecture	Discussion
15	2h		**Final Exam**		

11. Course Evaluation

Weekly pop quiz(10 marks) one-hour exams(10 marks), projects and assignments(20 marks), and the final exam(60 marks)

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	NA
Main references (sources)	**1- S. Rao, Mechanical Vibrations, 4th edition,2004.** **2- W.T. Thomsom , Theory of vibration with application , 3rd edition ,2018.** **3- W.T. Thomsom, Theory of vibration with application, 1st edition, 2018.**
Recommended books and references (scientific journals, reports…)	Any book in the field
Electronic References, Websites	Educational video

Pressure Vessel and pipes Design

1. Course Name:

Pressure Vessel and pipes Design

2. Course Code:

EMOG311

3. Semester / Year:

3rd Year, 1st Semester

4. Description Preparation Date:

2023

5. Available Attendance Forms:

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

2 Hours /Week Theoretical, 30 Hours (Total)

2 Units (Total)

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

Name: Akeel Abdulkareem Abtan
Email: Akeel.A.Abtan@uotechnology.edu.iq

8. Course Objectives

Course Objectives	• **– Learn the principles and methodologies of designing equipm specific to the oil and gas sector** • **– Understand the principles of structural integrity, reliability engineering, and failure analysis as applied to oil and gas equipment, with a focus on ensuring the mechanical integrity and long–term reliability of equipment components.** • **– Apply theoretical knowledge and engineering principles to real–wo design challenges and case studies drawn from the oil and gas indus**

9. Teaching and Learning Strategies

Strategy	Problem Based Learning (PBL)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2 3,4,5 6,7,8 9.10,11	3 Hours /Week	An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	● Riveted Joints ▪ Methods of Riveting ▪ Types of Riveted Joints ▪ Lap Joint. ▪ Butt Joint. ● Welded Joints ▪ Welding Processes. ▪ Fusion Welding. ▪ Types of Welded Joints. ▪ Stresses for Welded Joints. ● Screwed Joints ▪ Forms of Screw Threads. ▪ Stresses in Screwed Fastening due to Static Loading ▪ Stresses due to External Forces. ● Pipes and Pipe Joints ▪ Stresses in Pipes. ▪ Design of Pipes	PBL	Quiz Mid Exam Final Exam

12,13, 14,15			▪ Pipe Joints. ● Pressure Vessels ▪ Classification of Pressure Vessels. ▪ Stresses in a Thin Cylindrical. ▪ Thick Cylindrical Shell		

11. Course Evaluation	
Mid exam 15%, student activities 15%, Final exam 70%.	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	A Textbook of Machine Design by R.S.KHURMI AND J.K.GUPTA .2005
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Gas Compression Systems
2. Course Code:
EMOG312
3. Semester / Year:
1st Semester /3rd Year
4. Description Preparation Date:
4th Feb 2024
5. Available Attendance Forms:
Face to Face
6. Number of Credit Hours (Total) / Number of Units (Total)
32 hours through one semester /2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Abdulmunem R. Abdulmunem

Email: 50192@uotechnology.edu.iq

8. Course Objectives

Course Objectives	• Introducing the student to the types of fossil gas extracted and the mechanisms of exploring and extracting gas from the explored fields. • Introducing the student to the types and mechanism of operation of gas pressure systems and their importance in oil and gas fields. • Selecting appropriate gas compression systems according to the required efficiency based on design calculations. • Graduating engineers with competence, skill, and knowledge in the fields of oil and gas.

9. Teaching and Learning Strategies

Strategy	1- Provide the student with theoretical lectures. 2- Provide the student with different problems and introduce him the mechanism for solving them.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Add educational outcomes	Natural Gas Fundamentals	Giving lectures	Students' interaction with the lecture
2	2	Add educational outcomes	NATURAL GAS PROPERTIES	Giving lectures	Students' interaction with the lecture
3	2	Add educational outcomes	NATURAL GAS PHASE BEHAVIOR	Giving lectures	Students' interaction with the lecture
4	2	Add educational outcomes	PROBLEMS	Open discussions between the student and the lecturer	Giving the student an incentive reward (grades) and urging him to excel
5	2	Add educational outcomes	NATURAL GAS RESERVES	Giving lectures	Students' interaction with the lecture
6	2	Add educational outcomes	NATURAL GAS EXPLORATION AND PRODUCTION	Giving lectures	Students' interaction with the lecture
7	2	1st Examination			
8	2	Add educational outcomes	NATURAL GAS TRANSPORTATION SYSTEMS	Giving lectures	Students' interaction with the lecture
9	2	Add educational outcomes	COMPRESSORS TYPES	Giving lectures	Students' interaction with the lecture
10	2	Add educational outcomes	ANALYSIS OF ROTARY COMPRESSORS	Giving lectures	Students' interaction with the lecture
11	2	Add educational outcomes	PROBLEMS	Open discussions between the student and the lecturer	Giving the student an incentive reward (grades) and urging him to excel
12	2	Add educational outcomes	ANALYSIS OF RECIPROCATING COMPRESSORS	Giving lectures	Students' interaction with the lecture

13	2	Add educational outcomes	PROBLEMS	Open discussions between the student and the lecturer	Giving the student an incentive reward (grades) and urging him to excel
14	2	Add educational outcomes	MULTI-STAGE COMPRESSIONS	Giving lectures	Students' interaction with the lecture
15	2	Add educational outcomes	PROBLEMS	Open discussions between the student and the lecturer	Giving the student an incentive reward (grades) and urging him to excel
16	2	2nd Examination			

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Non
Main references (sources)	Non
Recommended books and references (scientific journals, reports…)	NATURAL GAS TRANSMISSION AND PROCESSING, SECOND EDITION, SAEID MOKHATAB & WILLIAM A. POE
Electronic References, Websites	Non

Course Description Form

1. Course Name:
Heat and Mass Transfer
2. Course Code:
EMOG307
3. Semester / Year:
First Semester/ Third Year
4. Description Preparation Date:
4/2/2024
5. Available Attendance Forms:
In-person
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hours / 15 units
7. Course administrator's name (mention all, if more than one name)
Name: Assoc. Prof. Dr. Amged Al Ezzi Email: amged.t.saeed@uotechnology.edu.iq

8. Course Objectives

Course Objectives	**. Fundamentals of Heat and Mass Transfer** **. Identify the mechanisms of heat and mass transfer** **. Identify dimensionless numbers** **. Definition of the mathematical formulations**

9. Teaching and Learning Strategies

Strategy	- Practical Examples for each topic - Group discussion - H.W. questions - Tests

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
Week1	2	Basics of heat & Mass Transfer	**Fundamentals of heat & Mass transfer**	lecture	examples
Week2	2	Energy balance		lecture	examples
Week3	2	Fourier's law	Open and close system	lecture	examples
Week4	2	Plane, cylindrical, and sphere conduction	Conduction heat transfer	lecture	examples
Week5	2	Test	Conduction heat transfer	lecture	examples
Week6	2	Newton's cooling law	Conduction heat transfer	lecture	examples
Week7	2	Types of flow		lecture	examples
Week8	2	External convection	Convection heat transfer	lecture	examples
Week9	2	Internal convection	Convection heat transfer	lecture	examples
Week10	2	Test	Convection heat transfer	lecture	examples
Weeek11	2	Radiation thermal resistance	Convection heat transfer	lecture	examples
Week12	2	Basics of mass transfer	Radiation heat transfer	lecture	examples
Week13	2				

Week14 Week15	2 2	Fick's law Sherwood's number Test	Mass transfer Mass transfer Mass transfer Radiation & Mass Transfer	lecture lecture	examples examples

11. Course Evaluation

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

- 60 % final exam
- 10% lab.
- 15% midterm exam
- 5% attended
- 5% quiz
- 5% class activities

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Introduction of Heat and Mass Transfer Incropera, F.P., and D.P. DeeWitt 7th ed.
Main references (sources)	Heat transfer by Holman
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	https://mech.at.ua/HeatandMassTransfer7thEdition Incropera-dewitt.pdf

Course Description Form

1. Course Name:
C++ programming
2. Course Code:
EMOG303
3. Semester / Year:
First semester 2024
4. Description Preparation Date:
2024-2-8
5. Available Attendance Forms:
Lecture and laboratory
6. Number of Credit Hours (Total) / Number of Units (Total)
44 theoretical hours + 44 practical's /66
7. Course administrator's name (mention all, if more than one name)
Name: Asifa Mohammed **Email**:50009 @uotechnology.edu.iq
8. Course Objectives

Course Objectives	1. The possibility of the learner obtaining skills through educational experience. By learning about the principles of programming language 2. That the learner realizes the importance of taking advantage of the computer's capabilities in solving his problems, and using the computer program for the C++ language. 3. The learner develops the motivation to benefit from computer capabilities and employ them in applying computer programs and completing engineering projects that simulate reality with theoretical study.
9. Teaching and Learning Strategies	
Strategy	o Programming basics o Teamwork o And educational games o Practical projects

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	To teach C++language	C++ programming basic	Lecture and laboratory	Question and answer discussion
2	4	Learn the basics of the langua	the introduction	Lecture laboratory	Discussion, question and answer assignments
3	4	Identify the types of mathematical operations and the tools used in them	numeric data types arithmetic	Lecture laboratory	Discussion, question answer assignments
4	4	Learn about input and output tools	cin /cout	Lecture laboratory	Discussion, question answer assignments
5	4	Understanding the basic variables and declaring them	Variables and the declaration	Lecture laboratory	Discussion, question answer assignments
6	4	Using types of variables and how to write them	FundamentalTypes varibles	Lecture laboratory	Discussion, question and answer assignments
7	4	Conditional tools and writin program about if	Selectio if,if/else, switch	Lecture laboratory	Discussion, question answer assignments
8	4	Termination tool blocks	Using the blocks statement w writing programs	Lecture laboratory	Write aprogram and apply it to the calculator
9	4	Writing if/else clauses with computer application	if /else statement	Lecture laboratory	Write aprogram an apply it to the calculato
10	4	Using the switch conditiona tool with examples	Switch statement	Lecture laboratory	Discussion, question an answer assignments
11	4	Understanding loops, their types, and their law	Repetition loops	Lecture laboratory	Write a program and fo a team to solve the examples
12	4	Writing a program for a whi loop with examples	while loop	Lecture laboratory	Question and Answer
13	4	Use the do statement. While examples	do/while loop	Lecture laboratory	discussion
14	4	Write a program about the for loop	For loop	Lecture laboratory	Team work to solve examples
15	4	Solve examples of for loop	For loop2	Lecture laboratory	Discuss and solve examples
16	4	Examples of using the break loop with the for loop	Program termination loop break	Lecture laboratory	Question and answer writing and writing programs
17	4	How to use continue statesn With practical examples	Program continuation loop	Lecture laboratory	Writing programs
18	4	Generating random numbers by computer	Random numbers	Lecture laboratory	Solve examples
19	4	Knowing the types of functions and finding mathematical resul	Types of functions	Lecture laboratory	Writing and solving programs

20	4	Use the mathematical function library	Mathematical functions	Lecture laboratory	Exam

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if an	**prgramming with c++ johnr hubbard pdf** Determined binding
Main references (sources)	Structured Programming(C++)
Recommended books and references (scientific journals, reports…)	كتاب خطوة بخطوة لتعلم++c
Electronic References, Websites	http://file.fouladi.ir/courses/fcp/books/Programming%20With%20C++.pd

Course Description Form

13. Course Name:

Numerical Analysis

14. Course Code:

EMOG302

15. Semester / Year:

3rd Year, 2nd Semester

16. Description Preparation Date:

2023

17. Available Attendance Forms:

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

4 Units

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

Name: Akeel Abdulkareem Abtan
Email: Akeel.A.Abtan@uotechnology.edu.iq

20. Course Objectives

Course Objectives	• The aim of the course is to graduate qualified engineers who have theoretical experience in advanced numerical analysis in the electromechanical field. • Provide theoretical knowledge and principles of advanced numerical analysis and the ability to analyze and solve numerical problems.

	• Illustration and discussion of the main application of numerical methods for the solution of equation(s)—linear and non-linear (algebraic)—that occur in most numerical electromechanical fields. • The student may also go beyond the subject and perform grid sensitivity, parame study, and stability analysis.

21. Teaching and Learning Strategies

Strategy	Problem Based Learning (PBL)

22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2,3 4,5,6 7,8 9,10 11,12,13	4H every week	An ability identify, formulate, solve engineering oil and equipment engineering problems applying principles engineering, science, mathematics.	Solution of non –linear equations by numerical methods: • Simple Iteration Method • Bisection method • Newton –Raphson iterative Numerical Solution of linear equations systems: • Direct method • Indirect method Numerical integration • Trapezoidal rule • Simpson's rule Numerical Differentiation • Finite-difference formula • Richardson Extrapolation • Derivatives Of Unequally Spaced Data Solution of differential equations by numerical methods: • Modified Euler's method • Runge-Kutta method	PBL	Quiz Mid Exam Final Exam

23. Course Evaluation

Mid exam 15%, student activities 15%, final exam 70%.

24. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	• Chapra, Steven C., and Raymond P. Canale., "Numerical methods for engineers," Vol. 2, New York: *McGraw-Hill*, 2012.
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Digital signal processing
2. Course Code:
EMOG310
3. Semester / Year:
Second Semester
4. Description Preparation Date:
7/2/2024
5. Available Attendance Forms:
Theoretical lecture
6. Number of Credit Hours (Total) / Number of Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Rasha Fahim Nadhim Email: rasha.f.nadhim@uotechnology.du.iq
8. Course Objectives

Course Objectives	• **– Understanding and classifying digital signal processing systems.** • **2–Understand how to convert an analogue signal to digital.** • **3–Understanding pulse and frequency analysis of intermittent signals.** • **4–Design digital filters and study their response.** • **5–Understanding and assimilating basic signals** • **6– Enable students to classify digital signals as odd or even** • **7– Enable students to classify digital signals according to whether they are**

	perodic or even • 8- Enabling students to classify digital systems based on their characteristics

9. Teaching and Learning Strategies

Strategy	• Theoretical lecture • Group discussion

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1		Understand, stu and analyze t topic	Introduction to digital signal processing	Theoreti lecture	Exam assignment
2		Understand, stu and analyze t topic	Basic elements of DSP, application DSP	Theoreti lecture	
3		Understand, stu and analyze t topic	Continues time signals and discre time signals	Theoreti lecture	
4+5		Understand, stu and analyze t topic	Discrete time signals and sequences	Theoreti lecture	
6+7		Understand, stu and analyze t topic	Unit sample sequence, Unit ste sequence	Theoreti lecture	
8		Understand, stu and analyze t topic	Unit ramp sequen Exponential sequence.	Theoreti lecture	
9			(classification of		

10+1		Understand, stu and analyze t topic	discrete time signals) system properties Static and dynam system, shift invariant and shif variant system	Theoreti lecture Theoreti lecture	
12		Understand, stu and analyze t topic	Causal and non-causal system, linear and nonline system, stable and unstable	Theoreti lecture	
13		Understand, stu and analyze t topic	Introduction to Z transform Definition of Z transform	Theoreti lecture	
14		Understand, stu and analyze t topic	Properties of Z transform, Invers transform, application of Z transform	Theoreti lecture	
15		Understand, stu and analyze t topic	Transformation Amplitude of the signal		
15		Understand, stu and analyze t topic Understand, stu and analyze t topic	Fast Four transform	Theoreti lecture	

11. Course Evaluation

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

15 exam marks 5 marks daily exam 10 rating points	
12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	• Digital signal processing. J.S.Chitode • Digital signal processing. Sanjit K. Mitra • Digital and analog communicati systems. Leon.W.Couch,II
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Course Description Form

1. Course Name:
Microprocessors and Microcontrollers
2. Course Code:
EMOG304
3. Semester / Year:
1st semester / year three
4. Description Preparation Date:
7−2−2024
5. Available Attendance Forms:
Attendance
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hrs. / 3 credits
7. Course administrator's name (mention all, if more than one name)
Name: Rafah Kareem Mahmood Email: 50150@uotechnology.edu.iq
8. Course Objectives

Objectives	• **Identify the nature of microprocessors and their types** • Identifying Microcontrollers and the difference between it and the Microprocessor • **Learning how to write programs in machine language (assembly language)** • Identifying students to the Integrated Development Environment, how to write programs through it, and display the results on the sequence board

9. Teaching and Learning Strategies

Strateg	• **Lectures are written on the board ,enrching and mathematical examples are solved** • **Solving questions and asking them to dialogue and answer on the board in front of the students to encourage them to understand and participate** • **Conduct daily exams to help them review topics** • **Not forcing students to write and making it optional, which will reflect positively on them and they will**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Introduction in Microprocessors and Types of microprocessors	Introduction in 8086 Microprocessor	lecturer	Quizzes and Homework
2	2	Architecture of 8086 Microprocessor	• Control unit • Execution unit • BUS Interface Unit • Arithmetic Logic Unit	lecturer	Quizzes and Homework
3	2	8086	• General Purpose Registers	lecturer	Quizzes and Homework

		Registers types	• Special Purpose Registers • Index Registers • Pointers Registers		
4	2	Memory Segmentation	• Data Segment • Code Segment • Stack Segment • Extra Segment	lecturer	Quizzes and Homework
5	2	Machine Language and Assembly Languagge	• Machine code and Operation code • Explaining how to write a code	lecturer	Quizzes and Homework
6	2	Instruction set used in 8086	Data Transfer Instructions	lecturer	Quizzes and Homework
7	2	Completion of Instruction set used in 8086	Arithmetic Instructions(ADD,SUB,MUL.DIV)	lecturer	Quizzes and Homework
8	2	Completion of Instruction set used in 8086	Arithmetic Instructions(ADD,SUB,MUL.DIV)	Exam	Exam
9	2	Mid-course Examination	Mid-course Examination	lecturer	Quizzes and Homework
10	2	Addressing Modes in Assembly Language	Addressing Modes without Memory Addressing Modes With memory	lecturer	Quizzes and Homework
11	2	Solving more Examples and questions		lecturer	Quizzes and Homework
12	2	Introduction to Microcontrollers	What is Microcontrollers and what is the difference between Microprocessors and Microcontrollers	lecturer	Quizzes and Homework
13	2	ARDUINO UNO Kit in details	Arduino UNO components and it's functions	lecturer	Quizzes and Homework
14	2	Introduction to Programming with Integrate	Libraries void setup void loop end	lecturer	Quizzes and Homework

		d Development Environment(IDE)			
15	2	Interfacing with Arduino	Operating small projects	lecturer	Quizzes and Homework

11. Course Evaluation	
15% mid exam – 15% student activities -- 10% laboratory 60% final Exam	
12. Learning and Teaching Resources	
Required textbooks (curricular books any)	8086 microprocessor
Main references (sources)	Intel Microprocessors. Programming Arduino
Recommended books and references (scientific journals, reports…)	IEEE Xplore
Electronic References, Websites	https://www.javatpoint.com/8086-microprocessor http://www.youtube.com/watch?v=VV7J_7brgcw&list=a4kqtM7SuFwpY8omRT32RK8kw1hDIGJ3

Course Description Form

1. Course Name:
Engineering statistics and optimization
2. Course Code:
EMOG309
3. Semester / Year:
Second Semester
4. Description Preparation Date:
5. Available Attendance Forms: Daily attendance according to the lecture schedule
6. Number of Credit Hours (Total) / Number of Units (Total): **2 hr/w**
7. Course administrator's name (mention all, if more than one name)

Name: Assistant lecturer. Hiba Ali Najim
Email: enghiba241@gmail.com

8. Course Objectives

Course Objectives	**• Applications of statistics in engineering, introduction to descriptive statistics** **• How to display and describe data** **• Introduction to probability theory, random variables, and various random distribution curve** **• Theories of sampling and statistical estimation** **• Choosing and testing statistical hypothes measuring the correlation coefficient, and how find and analyze regression equations.**

9. Teaching and Learning Strategies

Strategy	1- By explaining theoretical courses 2- By applying solutions to statistical problems

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Statistics a its importance Methods data collection (populatior sample)		Explanation of theoreti lectures subject teachers using teaching a presentatio methods	Daily exar daily student participati assessmer monthly exams, a final exam
2	2	Data collecti methods (measurement, tests, questionnaire)			
3	2	Data classificati (conditions, type			
4	2	Types of tab (ordered compound			

		double - recursiv			
5	4	Frequency tab with categori category center			
6	4	Probability: definition a roles, types, t events, thr events, mutua exclusive and nc mutually exclusi events, conditio events			
7	2	Variable: Types variables, discr population, continuous population, me variance			
8	2	Continuous a discrete distribution: normal a binomial distribution			
9	4	Constrained Optimization: Provide overview of how solve the gene problem nonlinear constrained optimization.			
10	4	Measures of cent tendency classified a unclassified da (arithmetic me median, mode)			
11	2	Review and exam			
11. Course Evaluation					

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

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	Allan G. Bluman . Elementary Statistics S. P. Gupta Statistical Methods Donald Arylucy Cheser Jacobs. Introduction to Statistics مبادئ الاحصاء الوصفي والتطبيقي والحيوي. زياد رمضان
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	Accessing the Internet through t World Wide Web

Course Description Form

1. Course Name:
Tribology
2. Course Code:
3. Semester / Year:
Second Semester/ Third year
4. Description Preparation Date:
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hours
7. Course administrator's name (mention all, if more than one name)
Name: Dr. Suad Hamzah Abbas Email: 50098@uotechnology.edu.iq
8. Course Objectives

Course Objectives	Upon completing the course, student will be able to: 1. Understand and importance of Tribological phenomenon 2. Optimize the friction and wear rate.

	3. Understand the wear mechanism. 4. Determine the application of Lubricants.

9. Teaching and Learning Strategies

Strategy	• Active Lectures. • Interactive Class Discussions. • Self-learning from Textbooks and Scientific Journals. • Project / Presentation.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Understand and importanc Tribological phenomenon	Introduction to Tribology	Theoretical Lecture	Class Discussio
2, 3	4	Understand the nature of rough surfaces, their topography and learn abou surface characterization techniques	Surface Topography and Contact	Theoretical Lecture	Oral exam
4, 5	4	Learn about the laws of friction, mechanisms of friction Understand the fundament principles of lubrication	Friction	Theoretical Lecture	daily preparatio
6,7	4		Lubricants and Lubrication	Theoretical Lecture	Class Discussions
8	2	Understand the fundament principles of wear, wear mechanisms and wear theories Understand the mechanism sliding wear	Mid- term exam		
9	2		Wear	Theoretical Lecture	Oral exam
10, 11	4	Understand the mechanism sliding wear	Adhesive wear (Sliding wear)	Theoretical Lecture	Report
12, 13	4	to be aware of importanc tribology, friction, wear lubrication and applications in enginee areas.	Erosive Wear	Theoretical Lecture	Report
14,15	4		Applications and Case Studies	Theoretical Lecture	Report

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports .... etc
10% – mid exam
10% - report
5% - oral exam
5% - Class Discussions

70% - final exam

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	
Main references (sources)	tribology in Materials and Applications By Jitendra Kumar Ramkumar, T. V. V. L. N. Rao and J. Paulo Davim. Engineering tribology by Gwidon W. Stachowiak Andrew W. Batchelor. Sahoo Prashant Engineering Tribology, Prentice-Hall India, New Delhi, 2005
Recommended books and references (scientific journals, reports…)	Friction, Wear, Lubrication A Textbook in Tribology By Kenneth C. Ludema and Oyelayo O. Ajayi. Principles of Tribology By Shizhu Wen a Ping Huang. Introduction to Tribology By J. Halling .
Electronic References, Websites	

Course Description Form

1. Course Name:
Oil and Gas Transportation Systems
2. Course Code:
EMOG313
3. Semester / Year:
Second Semester / Third Year
4. Description Preparation Date:
11-02-2024
5. Available Attendance Forms:
Present (in person)
6. Number of Credit Hours (Total) / Number of Units (Total)
2 Hours / 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Raheek Ismail Ibrahim

Email: raheek.i.ibrahim@uotechnology.edu.iq

8. Course Objectives

Course Objectives	• **The objective of this course is to develop a deeper understanding of how pipelines really work.** • **This course will serve the need for a single source of learning for petroleum engineering students to enter the business and industry in pipeline engineering companies and departments.**

9. Teaching and Learning Strategies

Strategy	• **Lectures: The theoretical and practical lectures will be presented throughout the semester.** • **Assignments: after the lectures, the assignment will be explained and given to students. It is expected to be done on weekly bases.** • **Quizzes: the contents of each lecture will be discussed during class for open question and answer to make sure every student will participate and active.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	• Understand and recommend the suitable methods for oil and gas transportation. • Use fluid properties and fluid hydraulics in pipe line designing. • Recommend the pump requirements for pipelines.	Transportation methods introduction Types of transportation methods Advantages of pipelines Multiphase in pipe flow Introduction Flow terminology Superficial and mixture velocity Gas holdup Phase and slip velocity Mixture density and viscosity Mixture pressure drop Flow regimes introduction Flow regimes in horizontal pipes Flow regimes in vertical pipes Flow map in horizontal pipes Flow map in vertical pipes Multiphase design parameters: temperature profile Velocity criteria Pressure drop calculations Homogeneous model	• Lectures • Projects • Discussion	• Homework • Project assignments • Mid-term exa • Final exam
2	2				
3	2				
4	2				
5	2				
6	2				
7	2				
8	2				
9	2				
10	2				
11	2				
12	2				
13	2				
14	2				
15	2				
16	2				
17	2				
18	2				
19	2				

11. Course Evaluation

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

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Hydrocarbon liquid transmission pipeline and stor systems: design and operation by M. Mohitpour, I Yoon, J.H. Russell, 2012.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Fourth Year

Design of Gas and Oil Equipment

1. Course Name:
Design of Gas and Oil Equipment
2. Course Code:
EMOG401
3. Semester / Year:
4th Year, 1st Semester
4. Description Preparation Date:
2023
5. Available Attendance Forms:
6. Number of Credit Hours (Total) / Number of Units (Total)
2 Hours /Week Theoretical, 30 Hours (Total) 2 Units (Total)
7. Course administrator's name (mention all, if more than one name)
Name: Akeel Abdulkareem Abtan Email: Akeel.A.Abtan@uotechnology.edu.iq
8. Course Objectives

Course Objectives	• **– Learn the principles and methodologies of designing equipm specific to the oil and gas sector** • **– Understand the principles of structural integrity, reliability engineering, and failure analysis as applied to oil and gas equipment, with a focus on ensuring the mechanical integrity and long–term reliability of equipment components.** • **– Apply theoretical knowledge and engineering principles to real–wo design challenges and case studies drawn from the oil and gas indus**

9. Teaching and Learning Strategies	
Strategy	Problem Based Learning (PBL)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2	3 Hours /Week	An ability to identify,	• Shafts	PBL	Quiz

3,4,5 6,7,8 8,9,10 11,12,13 14,15		formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	▪ Types of Shafts ▪ Stresses in Shafts ▪ Shafts Subjected to Combined Twisting Moment and Bending Moment. ▪ Shafts Subjected to Fluctuating Loads. ● Keys and Coupling ▪ Types of Keys. ▪ Shaft Couplings. ▪ Design of Flange Coupling ● Rolling Contact Bearings ▪ Types of Radial Ball Bearings ▪ Selection of Radial Ball Bearings ● Spur Gears ▪ Design Procedure for Spur Gears. ▪ Spur Gear Construction ▪ Design of Arms for Spur Gears. ● Helical Gears ▪ Face Width of Helical Gears. ▪ Formative or Equivalent Number of Teeth for Helical Gears. ▪ Strength of Helical Gears.		Mid Exam Final Exam

11. Course Evaluation

Mid exam 15%, student activities 15%, Final exam 70%.

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	A Textbook of Machine Design by R.S.KHURMI AND J.K.GUPTA .2005
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
Hydraulic systems
2. Course Code:
EMOG405
3. Semester / Year:
First/ 2023-2024
4. Description Preparation Date:
4/2/2024
5. Available Attendance Forms:
Attendance every week
6. Number of Credit Hours (Total) / Number of Units (Total)
30 Hours / 3 Units
7. Course administrator's name (mention all, if more than one name)
Name: Abduljabbar Muttair Ahmed Email: abduljabbar.m.ahmed@uotechnology.edu.iq

8. Course Objectives	
Course Objectives	• Defining the principle of hydraulic systems concepts. • Defining the construction of hydraulic systems coincided with a laboratory experiment. • Defining the hydraulic pumps: Theory of pumping- Types of pumps coincided with a laboratory experiment. • Defining the controlling valves like Direction control valve- Pressure control valve- Flow control valve. • Defining the actuators (hydraulic cylinder) with a laboratory experiment. • Defining the auxiliary hydraulic systems like accumulators.

9. Teaching and Learning Strategies	
Strategy	Teaching hydraulic systems as theory and mathematically, the constructions of hydraulic systems as pumps, control valves, and actuators with accessories devices like accumulators. Exams (Mid. exam, quiz, and other activities for evaluation, Lab with exam and three hours final exam).

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
3	6	An ability to identify, fundamental, formulate, and solve hydraulic system engineering problems by applying principles of engineering, science, and mathematics.	Principles of Hydraulic systems. Systems specification- Principle of hydraulic systems- Construction of hydraulic systems- Advantages and disadvantage of hydraulic systems- Symbols of hydraulic circuits- Examples and application.	Attendant Scientific lectures with method of problem-based learning (Pbl) and lectures video	Quizzes, exams, and other activities.
3	6		Hydraulic pumps: Theory of pumping- Types of pumps- Gear pumps- Blades pumps- Screw pumps- Piston pumps.		
3	6		Controlling valves: Direction control valve- Pressure control valve- Flow control valve.		
3	6		Actuators: Hydraulic cylinder (types and principle circuit)- Hydraulic motors- Moment, velocity, power and efficiency- Output performance and testing.		
3	6		Auxiliary hydraulic systems: Pipes- Filters- Measurement gauges- Heat exchangers-Accumulators.		

11. Course Evaluation

Exams (Mid. exam and quiz and other activities 25%, lecturer evaluation 5%, Lab 10% and three hours final exam 60%).

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	None
Main references (sources)	Fluid Power: Theory and Application, James A. Sullivan. Third Edition, A Reston Book Prentice Hall, Englewood Cliffs, New Jersey 1989
Recommended books and references (scientific journals, reports…)	• Practical hydraulic system, Ravi Doddannavar. Elsevier Science & Technology Books, 2005 • International Journal of Fluid Power
Electronic References, Websites	ALL academic Publications in Scopus and Web of Science.

1. Course Name:					
Pollution Control in Oil and Gas Industry.					
2. Course Code:					
EMOG409					
3. Semester / Year:					
First Course / 2023-2024.					
4. Description Preparation Date:					
February 2024.					
5. Available Attendance Forms:					
Class Attendance and, when necessary, Electronic Lectures.					
6. Number of Credit Hours (Total) / Number of Units (Total)					
30 hr. / 2 Units.					
7. Course Administrator's Name (mention all, if more than one name)					
Name: Ahmed Sabeeh Jasim. Email: envahmed@gmail.com Name: Noora Saleh Ekaab. Email: 20112@uotechnology.edu.iq					
8. Course Objectives					
Course Objectives	• Educating the student about the concepts of environment. • Increase knowledge about mechanisms to reduce pollution and wastes. • Proper methods of eliminating expected pollutants at work.				
9. Teaching and Learning Strategies					
Strategy	Class Assignments, Homework, Reports, Exams.				
10. Course Structure					
Week	**Hours**	**Required Learning Outcomes**	**Unit or Subject Name**	**Learning Method**	**Evaluation Method**
1	2	Introduction to Environment &	Environment & Pollution.	Recipient	Class Activity

		Pollution.			
2	2	Knowing the Environmental Causes & Influences.	Environmental Aspects & Impacts.	Participation	Class Activity
3	2	Knowing the relationship between Environmental Aspects & Impacts.	Environmental Management System.	Recipient	Class Activity
4	2	Know the various risks.	Environmental Impacts Evaluation.	Participation	Class Activity
5	2	The most appropriate methods for treating pollution.	Control of Pollution Hierarchy.	Recipient	Home Activity
6	2	Toxic Substances Classification.	Toxicity.	Participation	Class Activity
7	2	Understanding the Oil Industry Stages.	Oil & Gas Industry.	Participation	Writing Report
8	2	Identifying Oil Industry pollutants.	Oil & Gas Industry Pollutants.	Recipient	Class Activity
9	2	Knowledge of pollutants and their types.	Air Pollution.	Participation	Home Activity
10	2	Mid-Term Remark.	Semester Exam.	Test	Written Exam
11	2	Modern methods of combating pollution.	Air Pollution Treatment Techniques.	Participation	Class Activity
12	2	Knowing water Pollution & Sources.	Water Pollution.	Participation	Class Activity
13	2	Knowing the Mechanisms of Water Pollutants.	Water Pollutants Diffusion Factors.	Recipient	Home Activity
14	2	Knowing Soil Pollutants & Sources.	Soil Contamination.	Participation	Class Activity
15	2	Final Remark.	Final Exam.	Test	Written Exam

11.Course Evaluation

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

12.Learning and Teaching Resources	
Required Textbooks (Curricular Books, if any)	
Main References (Sources)	Environmental Science Book.
Recommended Books and References (Scientific Journals, Reports...)	Reports from Web.
Electronic References, Websites	• http://www.eolss.net/sample-chapters/c09/e4-14-04-03.pdf. • https://www.epa.gov/ghgreporting/ghgrp-and-oil-and-gas-industry. • https://www.schedulereader.com/blog/oil-and-gas-industry-overview/.

1. Course Name:	
Industrial Engineering	
2. Course Code:	
EMOG410	
3. Semester / Year:	
1st Semester / 4th Year	
4. Description Preparation Date:	
6/2/2024	
5. Available Attendance Forms:	
Paper's record method	
6. Number of Credit Hours (Total) / Number of Units (Total):	
28 h / 2	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Akram Hamzah Abed **Email:** akram.h.abed@uotechnology.edu.iq	
8. Course Objectives	
Course Objectives	**The objectives which can be achieved during teaching this course program are as follows:** **1.** How can an Engineer determine the most effective ways for an organization to use the basic factors of production **2.** How engineering helps organizations grow and expand efficiently during periods of prosperity, and streamline costs and consolidate and reallocate

	resources during austere times **3.**Developing performance modelling, measurement, and evaluation for systems. **4.** Developing and maintaining quality standards for industry and business. **5.** Applying production principles to pursue improvements in service organizations **6.** Improving overall productivity of integrated systems of people, materials, and processes **7.** Recognizing and incorporate factors affecting performance of a composite system **8.** Planning, organizing, scheduling, and controlling production and service projects **9.** Organizing teams to improve efficiency and effectiveness of and organization **10.** Installing technology to facilitate work flow

9. Teaching and Learning Strategies

Strategy	• **Adopting inquiry-based learning (as they ask – and answer – questions) can help students transform through working together, learning from failure, and pushing their boundaries.** • **Using technology to make teaching processes more efficient and aid in student learning.** • **Team-Based Learning: Segmenting students into groups is a great way to teach them skills in collaboration. While in their teams, they can discuss subjects and learn about the perspectives of others.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Enabling students to get the knowledge and understanding the fundamental of Industrial Engineering	**Introduction** • The Industrial Engineering and the Management Process. • The production and the productivity - Computing Productivity - Factors that affect Productivity. -Productivity Improvement • Break-Even Analysis	Lecture	Examinations, Quizzes
2-3	2	Enabling students to get knowledge of linear programming (LP) Models	**Linear programming (LP) Models** • Graphical Solution to LP -Solving Minimization Problems -Solving Maximization Problems • The Simplex Method -Solving minimization problems -Solving maximization problems	Lecture	Examinations, Quizzes, Home works
4-5	2	Enabling students to	**Assignment Model** • The Hungarian Method	Lecture	Examinations, Quizzes, Home

		get knowledge of the assignment model	• Maximization Case • Unbalanced Assignment Problems.		works
6-8	2	Enabling students to get knowledge of the Transportation Model	**Transportation Model** • Setting up Transportation Problem. • Developing an Initial Solution. • Northwest Corner Method. • Least–Cost Method. • Vogal's Approximation Method. • Stepping Stone Method	Lecture	Examinations, Quizzes, Home works
9-10	2	Enabling students to get knowledge of Sequencing Models	**Sequencing Models** • Processing N Jobs through One Machine. • Processing N Jobs through Two Machines. • Processing N Jobs through Three Machines.	Lecture	Examinations, Quizzes, Home works
11	2		Mid exam		Examination
12-14	2	Enabling students to get knowledge of Network Models	**Network Models** • Planning and Scheduling with Gantt Charts. • Frame Work of PERT and CPM. • Critical Path Method. • PERT	Lecture	Examinations, Quizzes, Home works

11.Course Evaluation

Daily preparation: 5
Written exams and home works: 25
Final exam: 70

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	-
Main references (sources)	**1. Hamdy A. Taha " Operations Research: an introduction" 6th edition (1997), Prentice-Hall.** **2. Hillier, F. S.; Lieberman, G. J. 1995. Introduction to Operations Research. New York, McGraw-Hill. 998 pp.** **3. Prem Kumar Gupta and D.S. Hira " Operations Research : an introduction" 2nd edition (1989) S. Chand & Company LTD, NewDelhi .**
Recommended books and references (scientific journals, reports…)	**Charles E. Ebeling "An Introduction to Reliability and Maintainability Engineering " (1997), McGraw-Hill**
Electronic References, Websites	-

1. Course Name:
Automation and Control
2. Course Code:
EMOG407
3. Semester / Year:
1st /2023 –2024
4. Description Preparation Date:
06-02-2024
5. Available Attendance Forms:
Attendance lectures
6. Number of Credit Hours (Total) / Number of Units (Total)
2 hours weekly (30 hours in course)/ 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Asst. Prof. Dr. Wisam Essmat Abdul-Lateef Email: 50110@uotechnology.edu.iq

8. Course Objectives	
Course Objectives	• Introducing students to automation systems, their basic components, design, principles of operation, and benefiting from them in various fields. • Introducing students to advanced control systems and artificial intelligence systems their components, design, operating principles, and how to use them. • Introducing students to the types of controls related to the operation of machines, automation systems, and special programming languages and how to use them and benefit from them. • Introducing students to the engineering designs of automation systems and understanding the mechanical and electrical parts that make up them.

9. Teaching and Learning Strategies	
Strategy	Theoretical lectures (delivering the lecture to students)

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1st	2	An introduction to understanding automation systems, their basic components and uses.	Introduction to automation systems basic components and uses.	Attendance lecture	Question and Answer

2nd	2	What are advanced control systems and their types.	An introduction to understanding advanced control and its uses.	Attendance lecture	Homework
3rd	2	What are artificial intelligence system	An introduction to understanding intelligence systems and their uses.	Attendance lecture	Quiz
4th	2	Study of the automation pyramid automated pyramid) and the social economic efficiency of using automa systems and smart systems.	An introduction to understanding automation systems, their design, and their operating principles.	Attendance lecture	Question and Answer
5th	2	Study the logic control units (PLC) operations and its laws.	Modern control technology in systems.	Attendance lecture	Question and Answer
6th	2	Study the distributed control system (DCS), its operations and its laws.	Modern control technology in systems.	Attendance lecture	Homework
7th	2	Study the Supervisory control and data acquisition (Scada), its operations and its laws.	Modern control technology in systems	Attendance lecture	Question and Answer
8th	2	Midterm exam.	Midterm exam	Attendance lecture	Editorial questions
9th	2	Study of the proportional-integral-differential controller (PID Controller) and learn of the Ziegler-Nichols method for adjusting the parameters of the PID controller.	Modern control technology in systems	Attendance lecture	Homework
10th	2	An introduction to understanding artificial intelligence systems, their design, and their operating principles.	Intelligent control systems technology.	Attendance lecture	Question and Answer
11	2	An introduction to understanding machine learning, its design, and its operating principles	Intelligent control systems technology.	Attendance lecture	Question and Answer
12	2	Study of artificial neural networks, their design and operating principles.	Intelligent control systems technology.	Attendance lecture	Quiz
13	2	Study of fuzzy logic controller, its design and working principle.	Intelligent control systems technology.	Attendance lecture	Question and Answer
14	2	Study of the genetic algorithm controller, its design and operating principles.?	Intelligent control systems technology.	Attendance lecture	Homework
15th	2	An introduction and study the Robotic Systems and their design and applications.	Robotic Systems		

	2		technology.	Attendance lecture	Quiz

11. Course Evaluation
5% attendance grade; 5% homework; 5% Quizzes; 15% midterm exam; 70% final exam

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

1. Course Name:
Electric Drives
2. Course Code:
EMOG404
3. Semester / Year:
2nd /2023-2024
4. Description Preparation Date:
5/2/2024
5. Available Attendance Forms:
According to UoT-Iraq policy, every student should attend at least 80% of the course classes. Attendance grades may be given during the semester in the form of quizzes and will be factored into the homework grade. Each student is responsible for anything discussed, stated, or handed out in class.
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hrs / 3 units
7. Course administrator's name (mention all, if more than one name)

Name: Asst.Prof.Dr.Ali H.Numan
Email: ali.h.numan@uotechnolgoy.edu.iq

8. Course Objectives

Course Objectives	- To understand the components of electric drives and their practical requirements. - To describe the construction and operation principles of dc and ac drives. - To analyze and design electric drives that meet mechanical load requirements like oil pumps.

9. Teaching and Learning Strategies

Strategy	1- Lecture notes 2- Discussions 3- Tutorials 4- Quizzes 5- Assignments (paper and Google Classroom) 6- Exams (mid and final)

10.Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
#1	2	The students will be able to understand the concept and structure of electric drives	- Introduction to classical and modern electric drives	Lecture notes Tutorial Reports	Discussions Quizzes Assignments
#2	2	The students will be able to recognize, analyze, and understand the practical requirements of these motor drives	- Single phase halfwave converter fed dc drives - Single phase semi converter fed dc drives	Lecture notes Tutorial Reports	Discussions Quizzes Assignments
#3	2	The students will be able to recognize, analyze, and understand the practical requirements of these motor drives	- Single phase fullwave converter fed dc drives - Single phase dual converter fed dc drives	Lecture notes Tutorial Reports	Discussions Quizzes Assignments

#4	2	The students will be able to recognize, analyze, and understand the practical requirements of these motor drives	- Three phase halfwave converter fed dc drives - Three phase semi converter fed dc drives	Lecture notes Tutorial Reports	Discussions Quizzes Assignments
#5	2	The students will be able to recognize, analyze, and understand the practical requirements of these motor drives	- Three phase fullwave converter fed dc drives - Three phase dual converter fed dc drives	Lecture notes Tutorial Reports	Discussions Quizzes Assignments
#6	2				Mid Exam #1
#7	2	The students will be able to recognize, analyze, and understand the practical requirements of this motor drive	- Chopper fed dc drives - Regenerative breaking control	Lecture notes Tutorial Reports	Discussions Quizzes Assignments
#8	2	The students will be able to recognize, analyze, and understand the practical requirements of this motor drive	- Two quadrant chopper fed dc drives	Lecture notes Tutorial Reports	Discussions Quizzes Assignments
#9	2	The students will be able to recognize, analyze, and understand the practical requirements of this motor drive	- Four quadrant chopper fed dc drives	Lecture notes Tutorial Reports	Discussions Quizzes Assignments
#10	2	The students will be able to recognize, analyze, and understand the practical requirements of this motor drive	- Stator voltage control of ac induction motor drive	Lecture notes Tutorial Reports	Discussions Quizzes Assignments
#11	2	The students will be able to recognize, analyze, and understand the practical requirements of this motor drive	- Stator frequency control of ac induction motor drive	Lecture notes Tutorial Reports	Discussions Quizzes Assignments
#12	2	The students will be able to recognize, analyze, and understand the practical requirements of this motor drive	- Stator voltage and frequency control of ac induction motor drive	Lecture notes Tutorial Reports	Discussions Quizzes Assignments
#13	2	The students will be able to recognize, analyze, and understand the practical requirements of these motor drive	- Static rotor resistance control of ac induction motor drive - Slip energy recovery	Lecture notes Tutorial Reports	Discussions Quizzes Assignments

			control of ac induction motor drives		
#14	2				Mid Exam #2
#15	2	The students will be able to review and discuss course material	Review and discussions	Tutorial	Discussions

11. Course Evaluation

Course evaluation is as follows:

Category	Percentage
Attendance and discussion in class	10%
Mid-term exams, quizzes, and reports	20%
Final exam	70 %

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1- D.P. Kothari and R.S. Lodhi, "Electric Drives" I.K. International Publishing House Pvt. Ltd. ,2016, ISBN: 9789384588120. 2- N. Mohan, "Electric Machines and Drives, A First Course" John Wiley and Sons, 2012, ISBN: 9781118074817. 3- G. K. Dubey "Power Semiconductor Controlled Drives", Prentice Hall, 1989, ISBN: 9780136868903.
Recommended books and references (scientific journals, reports...)	- G. K. Dubey and Gopal K. Dubey ,"Fundamentals of Electrical Drives", Narosa Publishing House, 2002, ISBN: 9788173194283
Electronic References, Websites	

1. Course Name:

Occupational Safety and Reliability.

2. Course Code:

EMOG412

3. Semester / Year:

Second Course / 2023-2024.

4. Description Preparation Date:

February 2024.
5. Available Attendance Forms:
Class Attendance and, when necessary, Electronic Lectures.
6. Number of Credit Hours (Total) / Number of Units (Total)
30 hr. / 2 Units.
7. Course administrator's name (mention all, if more than one name)
Name: Ahmed Sabeeh Jasim. Email: envahmed@gmail.com Name: Noora Saleh Ekaab. Email: 20112@uotechnology.edu.iq
8. Course Objectives

Course Objectives	• Educating the student about the concepts of the Health, Safety and Environment system. • Increase knowledge about mechanisms to reduce accidents and injuries. • Proper methods of eliminating expected risks at work.
9. Teaching and Learning Strategies	
Strategy	Class Assignments, Homework, Reports, Exams.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	HSE System Introduction.	HSE System.	Recipient	Class Activity
2	2	How to avoid Accidents.	Procedures used to reduce accidents.	Participation	Class Activity
3	2	Know the various risks.	Work environment risks.	Participation	Class Activity
4	2	Reasons & Treatments of Fires	Fires.	Recipient	Home Activity
5	2	How to use fire extinguishers.	Fire Extinguishers.		
6	2	Understanding how to deal with microorganisms.	Biological Risks.	Participation	Writing Report
7	2	How to deal with energy.	Electrical hazards.	Recipient	Class Activity
8	2	Safety Procedures through Maintenance Tasks.	Lockout & Tag out	Recipient	Class Activity
9	2	How to Drill properly.	Working in Confined Spaces.	Participation	Home Activity
10	2	Mid-Term Remark.	Semester Exam.	Test	Written Exam
11	2	How to work in	Chemical hazards.	Participation	Class

		laboratories.			Activity
12	2	Safe handling of flammable materials.	Flammable Liquids.	Participation	Class Activity
13	2	Securing Storage of of Materials.	Warehouse Storage	Recipient	Writing Report
14	2	Treatment with Injuries.	First Aids	Recipient	Home Activity
15	2	Final Remark.	Final Exam.	Test	Written Exam

11.Course Evaluation

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

12.Learning and Teaching Resources

Required Textbooks (Curricular Books, if any)	
Main References (Sources)	Encyclopedia of Occupational Health and Safety
Recommended Books and References (Scientific Journals, Reports...)	Reports from Web.
Electronic References, Websites	• https://afgruppen.no/globalassets/hms/ny-hms-handbok/af-hms-haendbok-en-ia-0222.pdf. • https://www.aventa.fr/wp-content/uploads/2022/07/Aventa_HSE-Policy.pdf.

1. Course Name:
Economics of oil and gas
2. Course Code:
EMOG408
3. Semester / Year:
Second Semester
4. Description Preparation Date:
4/2/2024

5. Available Attendance Forms:

Daily attendance according to the lecture schedule

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

2 hr/w

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

Name: Assistant lecturer. Hiba Ali Najim
Email: enghiba241@gmail.com

8. Course Objectives

Course Objectives	**• Increasing students' experience and knowledge the field of crude oil, its industry, and its importance to the economy in general and the Ira economy in particular** **• Introducing the student to the theories of crude oil formation and the most important stages of th industry** **• Introducing the student to the most important characteristics of the oil industry** **• Introducing the student to the most important factors determining crude oil consumption** **• Introducing the student to the importance crude oil as a major source of energy**

9. Teaching and Learning Strategies

Strategy	1- By explaining theoretical courses 2- By applying solutions to the required problems

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	Identifying t nature of oil a its relationship other sciences a theories of	Introduction to economics and t nature of the industry	Explanation of theoreti lectures subject teachers using	Daily exar daily student participati assessmen monthly

		formation		teaching a presentatio methods	exams, a final exam
2	2	Knowing t quantities suppli and required crude oil and flexibility	Economic analy of the global market		
3	2	Knowing the m important facto affecting crude pricing, oil tren and its futu effects	Oil prices a factors affecti pricing		
4	2	Identify t extent of t impact of stora on oil-produci countries and t international market	Oil storage and effects on t global oil market		
5	2	Know t development investment in t oil indus historically	The nature of investments, th development, a their effects on c producing countries		
6	2	Knowledge subsequent operations	The petroleu industry subsequent to t production and u of gas		
7	2	Knowledge theories th attempted explain a analyze deplet	Analysis exhaustible resources and t theories Houtlink a		

		resources	Harunk		
8	2	It tries to focus the possibility rationalizing energy consumption	Introduction energy economic		
9	2	Identify curre and futu alternative ener resources crude oil	Different sources energy and t development supply and dema for them		
10	2	Identify the m important polic for restricti pollution a carbon tax	Energy sources a the problem environmental pollution		
11	2	Learn abo energy policies Iraq	Energy secur and energy polici		
12	2	Identify alternative sources of oil a their impact global prices crude oil	The possibility substitution between deplet and renewal alternative sourc		
13	2	Foresight renewable sourc	Future outlook depleted resourc		
14	2	Identify the typ and sources electrical energy	electrical energy		
15	2		Review and exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	اقتصاديات النفط / د. احمد حسين الهيتي
Main references (sources)	اقتصاديات الصناعة النفطية/ د.محمود ازهر السماك اقتصاديات الطاقة \ د. احمد جاسم الياسري

Recommended books and references (scientific journals, reports…)	اقتصاد النفط / د. نبيل جعفر عبد الرضا
Electronic References, Websites	Accessing the Internet through t World Wide Web

1. Course Name:					
Maintenance of Equipment					
2. Course Code:					
EMOG403					
3. Semester / Year:					
Second semester/ Fourth stage					
4. Description Preparation Date:					
4/2/2024					
5. Available Attendance Forms:					
Mandatory class attendance					
6. Number of Credit Hours (Total) / Number of Units (Total)					
30 hours/ 2 units					
7. Course administrator's name (mention all, if more than one name)					
Name: Name: Prof. Dr. Raed Naeem Hwayyin Email: 10596@uotechnology.edu.iq					
8. Course Objectives					
Course Objectives	• Learn the types of approved maintenance in companies. • Learn the characteristics of each type of maintenance and its benefits. • Learn how to develop a troubleshooting plan. • Learn how to calculate the time to expect breakdowns. • Learning to calculate costs to determine the decision to use preventive maintenance or not. • Learn to calculate the most appropriate time to replace damaged parts entirely or in part				
9. Teaching and Learning Strategies					
Strategy	The lecture strategy was adopted as a method of teaching that includes a discussion point on the topic as well Assigning students to submit a report on a realistic account of any of the curriculum topics.				
10. Course Structure					
Week	**Hours**	**Required Learning**	**Unit or subject name**	**Learning**	**Evaluation**

		Outcomes		method	method
Week 1	2	Learn about maintenance concepts and types	**The Concept of Maintenance**	The Lecture	Quizzes, Report
Week 2	2	Identify the components of the maintenance system and the mechanism of their connection in completing the maintenance process	**Elements of a maintenance management system**	The Lecture	Quizzes, Report
Week 3	2	Learn about preventive maintenance, its benefits and goals	**Objectives & Benefits preventive maintenance (PM)**	The Lecture	Quizzes, Report
Week 4	2	Identify the components of preventive maintenance	**Components of Preventive Maintenance (PM)**	The Lecture	Quizzes, Report
Week 5	2	Classification of the types of faults occurring in the production line	**Classification of malfunction**	The Lecture	Quizzes, Report
Week 6	2	Ability to plan breakdowns with regular work schedules	**The malfunctions planning**	The Lecture	Quizzes, Report
Week 7	2	Ability to determine and calculate replacement timing and procedures	**Replacement**	The Lecture	Quizzes, Report
Week 8	2	Ability to develop a maintenance plan efficiently	**Maintenance Planning**	The Lecture	Quizzes, Report
Week 9	2	Ability to determine maintenance planning requirements	**Planning requirements for maintenance work**	The Lecture	Quizzes, Report
Week 10	2	Ability to set up schedule for scheduled maintenance	**Preparing the general annual schedule for scheduled maintenance**	The Lecture	Quizzes, Report
Week 11	2	Identify the mechanism for replacing units that are completely and suddenly damaged	**Replacing units that are completely and suddenly damaged**	The Lecture	Quizzes, Report
Week 12	2	Learn about reliability and how to calculate it	**Reliability**	The Lecture	Quizzes, Report
Week 13	2	Learn about credibility systems and how to link them	**Reliability systems**	The Lecture	Quizzes, Report
Week 14	2	Access to tools related to the maintenance process	**Related Tools**	The Lecture	Quizzes, Report
Week 15	2	Learn about maintenance planning	**Strategic Planning in Maintenance**	The Lecture	Quizzes, Report

		strategies			

11. Course Evaluation

- **Midterm Exam : 10 Marks**
- **Report : 10 Marks**
- **Quizzes : 10 Marks**

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Mohamed Ben-Daya, Salih O. Duffuaa, Abdul Raouf , Jezdimir Knezevic, and Daoud Ait-Kadi, Editors Handbook of Maintenance Management and Engineering, Springer-Verlag London Limited 2009.
Main references (sources)	G. P. Sullivan, R. Pugh and, A. P. Melendez, and W. D. H , Operations & Maintenance Best Practices, August 2010.
Recommended books and references (scientific journals, reports…)	G. P. Sullivan, R. Pugh and, A. P. Melendez, and W. D. H , Operations & Maintenance Best Practices, August 2010
Electronic References, Websites	http://dx.doi.org/10.1007/978-1-84882-472-0

1. Course Name:
Ethics in Engineering
2. Course Code:
UOT400
3. Semester / Year:
First Semester / Fourth Year
4. Description Preparation Date:
11-02-2024
5. Available Attendance Forms:
Present (in person)
6. Number of Credit Hours (Total) / Number of Units (Total)
2 Hours / 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Raheek Ismail Ibrahim Email: raheek.i.ibrahim@uotechnology.edu.iq

8. Course Objectives

Course Objectives	• **To create an awareness on Engineering Ethics and Human Values.** • **To instill Moral and Social Values and Loyalty** • **To appreciate the rights of others.** • **To create awareness on assessment of safety and risk**

9. Teaching and Learning Strategies

Strategy	• **Lectures: The theoretical and practical lectures will be presented throughout the semester.** • **Assignments: after the lectures, the assignment will be explained and given to students. It is expected to be done on weekly bases.** • **Quizzes: the contents of each lecture will be discussed during class for open question and answer to make sure every student will participate and active.**

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 2 3 4 5 6 7 8 9 10 11 12 13 14	2 2 2 2 2 2 2 2 2 2 2 2 2 2	• Learn about morals, values, and work ethics. • Learn to respect others and develop civic virtue. • Develop commitment. • Learn how to live peacefully.	Ethical theories introduction Moral theory Utilitarianism Ethical problems introduction Types of issues in ethical problem Problems solving Case studies Line drawing method Understanding ethical problems introduction Cost benefit analysis Duty ethics and right ethics Risk and Accidents definitions Engineers and safety Safety and risk Examples and cas studies	• Lectures • Projects • Discussion	• Homework • Project assignments • Mid-term exa • Final exam

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Mike W. Martin and Roland Schinzinger "Ethics in Engineering" Tata McGraw- Hill–2003.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

1. Course Name:
Hydrocarbons Flow Assurance Systems
2. Course Code:
EMOG411
3. Semester / Year:
Second Semester / Fourth Year
4. Description Preparation Date:
11-02-2024
5. Available Attendance Forms:
Present (in person)
6. Number of Credit Hours (Total) / Number of Units (Total)
4 Hours / 2 Units
7. Course administrator's name (mention all, if more than one name)
Name: Prof. Dr. Raheek Ismail Ibrahim Email: raheek.i.ibrahim@uotechnology.edu.iq
8. Course Objectives

Course Objectives	• **Introduce students to the importance of flow assurance during oil and natural extraction and transport operations.** • **Explain the technical hazards and economic risks to flowline, pipeline and other equipment attributed to wax and natural gas hydrate formation.** • **Highlight well and equipment maintenance and care due to chemical introduction.**

9. Teaching and Learning Strategies	
Strategy	• **Lectures: The theoretical and practical lectures will be presented throughout the semester; the discussion of practical work within lab will be organized and illustrated with activities.** • **Assignments: after the lectures, the assignment will be explained and given to students. It is expected to be done on weekly bases.** • **Quizzes: the contents of each lecture will be discussed during class for open question and answer to make sure every student will participate and active.**

10. Course Structure

Week	Hours	Required	Unit or subject name	Learning	Evaluation

		Learning Outcomes		method	method
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	• Appreciate the importance of flow assurance during the petroleum production and transmission phases. • Understand the engineering and financial risks that wax and gas hydrates pose to flowlines, pipelines and other equipment.	Flow assurance management in production systems introduction Hydrates formation Management for flow assurance Slugging formation and management Scaling formation and manageme Erosion and its management Corrosion consequence and management Oil water emulsions Emulsion consequence and management PVT and rheology investigation introduction Phase behavior Fluid sampling Quality of fluid samples Hydraulics and thermal analysis introduction Hydraulics restrictions boundari Hydrodynamics of multiphase flo Flow modeling Machine learning and artificial intelligence in flow networks optimization	• Lectures • Projects • Discussion	• Homework • Project assignments • Mid-term exa • Final exam

11. Course Evaluation

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

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Handbook of Natural Gas Transmission and Processing by Saeid Mokhatab, William A. P, and James G. S., Gulf Professional Publishing, 2006.
Main references (sources)	
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	

Computer Aided Design and Manufacturing (CAD/CAM)

25. Course Name:
Computer Aided Design and Manufacturing (CAD/CAM)
26. Course Code:
EMOG402
27. Semester / Year:
4th Year, 2nd Semester
28. Description Preparation Date:
2023
29.Available Attendance Forms:
30.Number of Credit Hours (Total) / Number of Units (Total)
2 Hours /Week Theoretical, 1 Hours /Week Practical, 45 Hours (Total) 3Units (Total)
31. Course administrator's name (mention all, if more than one name)
Name: Akeel Abdulkareem Abtan Email: Akeel.A.Abtan@uotechnology.edu.iq
32. Course Objectives

Course Objectives	• **–Introduces the fundamental concepts in CAD/CAM systems** • **–Transferring part geometry from CAD to CAM for the development of a CNC–ready program.** • **–Use CAD/CAM software**

33. Teaching and Learning Strategies	
Strategy	Problem Based Learning (PBL)

34. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1,2 3,4,5	3 Hours /Week	An ability to identify, formulate, and solve engineering problems by applying principles of	• The Design Process ▪ The Product Cycle and CAD/CAM ▪ Benefits of Computer in Industry • Geometrical Transformations	PBL	Quiz Mid Exam Final Exam

6,7,8 8,9 10,11,12 13,14,15		engineering, science, and mathematics.	▪ Mathematical elements in 2-D graphics ▪ Mathematical elements in 3-D graphics ● Finite Element Method ▪ Spring Element ▪ Bar Element ● System Design and Manufacture ▪ Manufacturing Production Cycle ▪ Method of Workpiece Transport ▪ An Automation Block Building ● Fundamental of Numerical Control ▪ Basic Component Of (NC) System ▪ Classification of Numerical Control ● CNC Machines Part Programming ▪ Automatic Tool Changer ▪ Coordinate Systems ▪ An Introduction to Part Programming		

35. Course Evaluation

Mid exam 15%, student activities 15%, LAB 10%, final exam 60%.

36. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	1.Computer Aided Manufacturing, Chien, Richard and Wang, 2006 2.CAD/CAM Principles and applications, Pnrao, 2010
Recommended books and references (scientific journals, reports…)	
Electronic References, Websites	