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

Academic Programand Course Description Guide Mechanical Engineering Department

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: Diyala
Faculty/Institute: College of Engineering
Scientific Department: Mechanical Engineering Department
Academic or Professional Program Name: Bachelor
Final Certificate Name: Bachelor of Science in Mechanical Engineering
Academic System: Course
Description Preparation Date: 2024
Completion Date: 8-8-2024

Signature:
Head of Department Name: Asst. prof. Dr. Samir Gh. Yahya
Date: 8/8/2024

Signature:
Scientific Associate Name: Abidaoun H. Shallal
Date: 11/8/2024

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
Prof. Dr. Anees A. Khadom

1. Program Vision

The department aspires to open postgraduate studies to grant a master's degree in mechanical engineering in the coming years. The department aspires to establish research laboratories to complete the research of researchers from the department's professors or researchers from outside the university. The department aspires to raise the scientific level by using the latest scientific teaching methods such as laboratories and modern teaching methods such as exploiting computers and modern advanced information technology.

2. Program Mission

development of a country. The industrial progress of any country depends on several factors, the most important of which is the efficiency of the engineering staff capable of designing, implementing and managing advanced industrial projects. On this basis, the Department of Mechanical Engineering at the University of Diyala was established to provide the country with an engineering staff capable of advancing the country's industrial capabilities now and in the future. The Department of Mechanical Engineering at the University of Diyala was established in the academic year 2009-2010. The department currently receives about (25-30) students annually. It is hoped that the department's capacity will increase to 40 students, with a specialized teaching staff since its opening. A number of postgraduate students have been sent outside Iraq to obtain a doctorate degree

3. Program Objectives

Objectives: The department aims to teach a standard curriculum of mechanical engineering, and to qualify competent mechanical engineers to fill positions required by the need in Iraqi government departments or in the local or global labor market. We aspire for our graduates to obtain the best possible ideal curriculum for a mechanical engineer, so the department is keen to keep pace with updating its educational curriculum with global technological development on an ongoing basis

4. Program Accreditation

The department submitted an application to obtain program accreditation from the Iraqi Council for Engineering Accreditation

5. Other external influences

All relevant ministries in dealing with this program, such as the Ministry of Oil, Industry, Environment, and others

6. Program Structure				
Program Structure	**Number of Courses**	**Credit hours**	**Percentage**	**Reviews***
Institution Requirements	**0**	**0**	**0**	**0**
College Requirements	**4**	**10**	**9**	
Department Requirements	**38**	**99**	**90**	
Summer Training	**1 month**	**Without credit**		**Compulsory training**
Other				

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

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
first	E 101	Mathematics I	theoretical	practical
first	ME 101	Physics	3	1
first	ME 102	Static mechanic I	3	2
first	ME 103	Electrical engineering	4	1
first	UD 04	Human Rights and Democracy	4	2
first	ME 104	Engineering Workshops	2	0
first	UD 02	Arabic Language	0	3
first	E 102	Mathematics II	2	0
first	UD 03	Computer Skills	3	1
first	ME 105	Static mechanic II	1	2
first	ME 106	Engineering Drawing	4	1
first	UD 01	English Language	1	5
First	ME 107	Manufacturing process	4	0
First	ME108	Chemistry	4	0
Second	ME 201	Strength of Materials	4	1
Second	ME 211	Applied Mathematics I	3	1
Second	ME 210	Thermodynamics	4	1
Second	ME 204	Engineering of Metallurgy	4	1
Second	ME 206	Applied Computer Programming	1	2
Second	UD 04	English Language	2	0
Second	UD 05	Extinct Ba'ath Party Crimes	2	0
Second	ME 207	Dynamics	4	1
Second	ME 212	Electrical Machines	3	1
Second	ME 214	Applied Mathematics II	3	1
Second	ME 208	Mechanical Drawing by CAD	5	1
Second	ME 202	Fluid Mechanics I	4	1
Second	UD 06	Arabic Language	2	0
Third	ME 301	Mechanics of Machines	4	1
Third	ME 306	Internal Combustion Engines	4	1
Third	ME 303	Engineering Analysis	4	0

Third	ME 302	Engineering Statistics	3	0
Third	ME 304	Fluid Mechanics II	4	1
Third	ME 307	Engineering Numerical Methods	3	1
Third	ME 308	Production Engineering	3	0
Third	ME 313	Operations Research	3	0
Third	ME 311	Heat Transfer	4	1
Third	ME 310	Engineering Materials	4	0
Fourth	ME 401	Design of Machine Elements I	4	1
Fourth	E 404	Engineering Economy	3	0
Fourth	ME 403	Industrial Engineering	4	0
Fourth	ME 404	Mechanical Vibrations	4	1
Fourth	ME 405	Air Conditioning	4	2
Fourth	E 402	Eng. Graduation Project I	2	0
Fourth	ME 421	ME Elective Class	3	0
Fourth	ME 409	Design of Machine Elements II	4	1
Fourth	ME 402	Control Engineering	4	2
Fourth	ME 411	CAE	1	2
Fourth	ME 407	Power Plants	3	0
Fourth	ME 422	aerodynamics	3	0
Fourth	E 403	Eng. Graduation Project II	2	0

8. Expected learning outcomes of the program

Knowledge	
1- Knowledge and understanding 2- Awareness and understanding 3- Ability to apply	➢ Knowing the facts, concepts, principles and theories of chemical engineering, and understanding the determinants and constraints facing the engineer's work for the purpose of making the right decision. ➢ Understanding basic mathematical derivations and linking various phenomena with equations and laws to determine the variables that govern the industrial unit. ➢ The ability to know the optimal conditions for industrial work and manage it correctly. Awareness of industrial problems that may be specific to known or unknown circumstances. ➢ Analyze and discuss available data or conduct specific experiments to obtain more data. Design units and processes and make the necessary improvements. ➢ The ability to apply new technologies within the general jurisdiction. ➢ Having a comprehensive view of industrial engineering problems, taking into account cost, safety and quality
Skills	
1- The ability to use a variety of sources of understanding 2- Conduct successful laboratory experiments or design a safe experiment and extract important data 3- Work ethically and have the ability to identify and identify risks	Using multiple techniques and devices related to the specialty. ➢ Using laboratory equipment to find data. ➢ Develop and provide a safe work environment by selecting the most appropriate devices and equipment.
Ethics	
1- Professional work, taking into account costs and occupational safety 2- Working in the spirit of one team and ensuring human victory 3- Anticipating problems and finding appropriate solutions to them	➢ Using multiple techniques and devices related to the specialty. ➢ Using laboratory equipment to find data. ➢ Develop and provide a safe work environment by selecting the most appropriate devices and equipment.

9. Teaching and Learning Strategies

1. Theoretical lectures with the use of illustrations.
2. Practical laboratory application of concepts taught theoretically
3. Assigning students to perform seminars by assigning them a topic to be discussed with their colleagues
4. Solve problems, discuss them, and assign students some homework and reports through the e-learning platform

10. Evaluation methods

Sudden exams (5) marks
• Monthly exams (25) marks
• Reports assigned to them (5) degrees
• Homework assignments (5) marks
• A final examination of the curriculum (60 marks).

11. Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements (if applicable)		Number of the tea	
	General	Special			Staff	Lecturer
Asst. Prof. Dr. Samir Gh. YAHYA	Mechanical Engineering	Thermo-fluids			Staff	
Prof. Dr. Arshad Abdul Hamid Mohammed Abdul	Mechanical Engineering	Applied			Staff	
Prof. Dr. Jassim Abdul Latif Mohammed	Mechanical Engineering	Thermo-fluids			Staff	
Dr. Mazen Mahmoud Yahya Ahmed	Mechanical Engineering	Applied			Staff	
Asst. Prof. Dr. Ahmed Shehab Ahmed	Mechanical Engineering	Power			Staff	
Asst.Prof.Dr. Itimad Dawood Juma	Mechanical Engineering	Power			Staff	
Asst. Prof. Dr. Qusay Tawfiq Hassan Kaitan	Mechanical Engineering	Thermal power			Staff	
Assistant Professor Nizar Munim Mahmoud Salman	Mechanical Engineering	Aerodynamic			Staff	
Asst. Prof. Dr. Mohammed Ismail Hamid Mohammed	Mechanical Engineering	Applied			Staff	
Asst. Prof. Dr. Mohammed Khader Abbas Jassim	Mechanical Engineering	Fluids			Staff	
Dr. Mohammad Reza Jawad Kazim	Mechanical Engineering	Heat transfer			Staff	
Asst. Prof. Dr. Zaid Salem Hamoudi	Mechanical Engineering	General Design			Staff	
Asst. Prof. Dr. Diaa Ahmed Salal	Mechanical Engineering	Applied			Staff	
Asst. Prof. Dr. Salwa Abbas Abdel-Sabaa	Mechanical Engineering	Applied			Staff	
Ms. Iman Mohammed Ne'ma	Mechanical Engineering	Applied			Staff	
Saadoun Abdul Hafeez Jawad Kazim	Mechanical Engineering	power			Staff	
Khader Najm Abdul Nasser	Mechanical Engineering	power			Staff	
Asst. Prof. Dr. Laith Abdul Hasnawi Hassan	Mechanical Engineering	Thermal power			Staff	
Yassin Alwan, Khader	Mechanical Engineering	Thermal power			Staff	

Professional Development

Mentoring new faculty members

New teaching staff are developed by putting them in central development courses organized by the university, as well as by interacting with senior staff during periodic meetings in the department for the purpose of introducing them to the work contexts and informing them of directives and instructions, along with giving advice, daily guidance and continuous follow-up.

Professional development of faculty members

Professional development for faculty members takes place through the Divisions of Continuing Education and Academic Affairs in the Deanship of the College and its corresponding departments in the University, which constantly work to hold discussion circles and specialized scientific seminars, while reviewing what is published on the Internet sites of books and periodicals in various scientific specializations

12. Acceptance Criterion

Admission is centralized by the Ministry of Higher Education and Scientific Research according to the grade point average of the students obtained in the sixth scientific stage

13. The most important sources of information about the program

Diyala University website / College of Engineering / Department of Chemical Engineering
Website of the Ministry of Higher Education and Scientific Research

14. Program Development Plan

➢ Development is carried out by focusing on the advanced scientific staff in the department and through the committees formed annually, especially the Scientific Committee and the Quality Assurance and Academic Accreditation Committee.

➢ By preparing evaluation studies to prepare and develop senior leadership cadres in all aspects of the educational institution.

➢ Equipping scientific laboratories with modern equipment and qualifying their cadres in order to improve the most efficient performance.

➢ Develop future plans and work to implement them

➢ Creating a kind of competition among researchers, honoring the distinguished ones and motivating them to give more.

➢ Working to create a kind of financial income for the department to sustain and develop the work

➢ Supporting the department's first-in-class admission program annually and enrolling them in postgraduate studies.

➢ Conducting a twinning process with advanced universities and providing training opportunities for teaching staff in those universities

Program Skills Outline															
				Required program Learning outcomes											
Year/ Level	Course Code	CourseName	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First Year	E 101	Mathematics I	Basic	√				√						√	
	ME 101	Physics	Basic		√					√				√	
	ME 102	Static mechanic I	Basic			√									√
	ME 103	Electrical engineering	Basic					√							
	UD 04	Human Rights and Democracy	Basic												
	ME 104	Engineering Workshops	Basic	√				√				√			
	UD 02	Arabic Language	Basic												
	E 102	Mathematics II	Basic	√				√						√	√
	UD 03	Computer Skills	Basic		√					√				√	
	ME 105	Static mechanic II	Basic			√									
	ME 106	Engineering Drawing	Basic					√							
	UD 01	English Language	Basic												
	ME 107	Manufacturing process	Basic	√				√				√			√
	ME108	Chemistry	Basic												
Second Year	ME 201	Strength of Materials	Basic	√				√						√	√
	ME 211	Applied Mathematics I	Basic		√					√				√	
	ME 210	Thermodynamics	Basic			√									
	ME 204	Engineering of Metallurgy	Basic					√							
	ME 206	Applied Computer Programming	Basic												
	UD 04	English Language	Basic	√				√				√			√
	UD 05	Extinct Ba'ath Party Crimes	Basic												
	ME 207	Dynamics	Basic	√				√						√	√
	ME 212	Electrical Machines	Basic		√					√				√	
	ME 214	Applied Mathematics II	Basic			√									
	ME 208	Mechanical Drawing by CAD	Basic					√							
	ME 202	Fluid Mechanics I	Basic												
	UD 06	Arabic Language	Basic	√				√				√			√

Third Year	ME 301	Mechanics of Machines	Basic													
	ME 306	Internal Combustion Engines	Basic	√				√							√	√
	ME 303	Engineering Analysis	Basic		√					√					√	
	ME 302	Engineering Statistics	Basic			√										
	ME 304	Fluid Mechanics II	Basic					√								
	ME 307	Engineering Numerical Methods	Basic													
	ME 308	Production Engineering	Basic	√				√				√				√
	ME 313	Operations Research	Basic													
	ME 311	Heat Transfer	Basic	√				√							√	√
	ME 310	Engineering Materials	Basic		√					√					√	
Fourth Year	ME 401	Design of Machine Elements I	Basic			√										
	E 404	Engineering Economy	Basic					√								
	ME 403	Industrial Engineering	Basic													
	ME 404	Mechanical Vibrations	Basic	√				√				√				√
	ME 405	Air Conditioning	Basic													
	E 402	Eng. Graduation Project I	Basic	√				√							√	√
	ME 421	ME Elective Class	Basic		√					√					√	
	ME 409	Design of Machine Elements II	Basic			√										
	ME 402	Control Engineering	Basic					√								
	ME 411	CAE	Basic													
	ME 407	Power Plants	Basic	√				√				√				√
	ME 422	aerodynamics	Basic													
	E 403	Eng. Graduation Project II	Basic	√				√							√	√

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

Course Specification

Fourth Year

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	Design of Machine Elements I
2. Course code	ME401
3. Semester/Year	1st Semester – 4th Year
4. Date of production/revision of this specification	Augest 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	60 hours /3 units
7. Course administrator's name (mention all, if more than one name)	Asst. Prof. Dr. Zaid S. Hammoudi zaidsalem_eng@uodiyala.edu.iq
8. Aims of the Course	
Objective 1: To teach students how to apply the concepts of stress analysis, theories of failure and material science to analyze, design and/or select commonly used machine .components Objective 2: To illustrate to students the variety of mechanical components available .and emphasize the need to continue learning Objective 3: To teach students how to apply mechanical engineering design theory to identify and quantify machine elements in the design of commonly used mechanical systems	

B. The skills goals special to the course.

B1 - Learn fundamentals of mechanical design.

B2- Learn how to make decisions about designing mechanical components.

B3- Computing stresses and strains on mechanical components and relating stresses to strength and safety of design.

C. Affective and value goals

C1- Estimate the safety of design in withstanding loades and working conditions

C2-

9- Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	4	Fundamentals of mechanical Design; - Selecting materials - Stress and deformation - Factor of safety - Units and standards	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 2	4	- Stresses in thick cylinders due to internal and external pressure - Shrink fits	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	4	Stresses in curved beams	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	4	- Spherical contact - Cylindrical contact	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	4	Buckling of columns	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 6	4	Failure theories of ductile materials	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	4	Failure theories of ductile materials	Have a basic information about the subject and be able to solve elementary	Daily exams + monthly exams

			problems	
Week 8	4	Failure theories of brittle materials	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	4	Fatigue of materials ◆ The Endurance Limit ◆ Fatigue Strength	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	4	◆ Endurance Limit Modifying Factors ◆ Stress Concentration and Notch Sensitivity	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	4	Fatigue Failure Criteria for Fluctuating Stress	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	4	Fatigue, Combinations of Loading Modes	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	4	Shafts and Shaft Components Shaft Materials Shaft Layout	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	4	Shaft Design for Stress	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	4	Shaft Design for Stress	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	SHIGLEY'S MECHANICAL ENGINEERING DESIGN, NINTH EDITION
2. Main references (sources)	SHIGLEY'S MECHANICAL ENGINEERING DESIGN, NINTH EDITION
A- Recommended books and references (scientific journals, reports…).	Mechanical Design of Machine Components, Second Edition Ugural, Ansel C
B-Electronic references, Internet sites…	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	Design of Machine Elements II
2. Course code	ME409
3. Semester/Year	2nd Semester – 4th Year
4. Date of production/revision of this specification	Augest 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	60 hours /3 units
7. Course administrator's name (mention all, if more than one name)	Asst. Prof. Dr. Zaid S. Hammoudi zaidsalem_eng@uodiyala.edu.iq
8. Aims of the Course	
Objective 1: To teach students how to apply the concepts of stress analysis, theories of failure and material science to analyze, design and/or select commonly used machine .components Objective 2: To illustrate to students the variety of mechanical components available .and emphasize the need to continue learning Objective 3: To teach students how to apply mechanical engineering design theory to identify and quantify machine elements in the design of commonly used mechanical systems	

B. The skills goals special to the course.

B1 - Learn fundamentals of mechanical design.

B2- Learn how to make decisions about designing mechanical components.

B3- Computing stresses and strains on mechanical components and relating stresses to strength and safety of design.

C. Affective and value goals

C1- Estimate the safety of design in withstanding loades and working conditions

C2-

9- Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	4	Screws, Fasteners, and the Design of Nonpermanent Joints - Basics - The Mechanics of Power Screws	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 2	4	- Threaded Fasteners - Joints—Fastener Stiffness - Joints—Members Stiffness	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	4	Bolt Strength Tension Joints—The External Load Relating Bolt Torque to Bolt Tension Statically Loaded Tension Joint with Preload Fatigue Loading of Tension Joints	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	4	Welding, Bonding,and the Design of Permanent Joints Stresses in Welded Joints in Bending	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	4	The Strength of Welded Joints Fatigue Loading	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 6	4	Mechanical Springs	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	4	Compression Springs	Have a basic information about the subject and be able to solve elementary	Daily exams + monthly exams

			problems	
Week 8	4	Fatigue Loading of Helical Compression	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	4	Rolling-Contact Bearings	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	4	Lubrication and Journal Bearings	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	4	Hydrodynamic Theory	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	4	Design Considerations	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	4	Types of Gear	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	4	Spur and Helical Gears The Lewis Bending Equation	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	4	Gear Surface Durability	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	SHIGLEY'S MECHANICAL ENGINEERING DESIGN, NINTH EDITION
2. Main references (sources)	SHIGLEY'S MECHANICAL ENGINEERING DESIGN, NINTH EDITION
A- Recommended books and references (scientific journals, reports…).	Mechanical Design of Machine Components, Second Edition Ugural, Ansel C
B-Electronic references, Internet sites…	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	Air - Conditioning
2. Course code	ME 403
3. Semester/Year	1st Semester – 4th Year
4. Date of production/revision of this specification	August 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	75 hours /6 units
7. Course administrator's name (mention all, if more than one name)	Asst. Prof. Layth Abed Hasnawe : laeth_abdhasnawi_eng@uodiyala.edu.iq
8. Aims of the Course	
The objective is to develop a knowledge of HVAC. The course will include the following topics of discussion: air and humidity calculations, physiological reactions for cooling and heating, thermal calculations and heating systems, air – conditioning and cooling calculations, classification of air ducts, design of air ducts for air distribution systems, ventilation and air cleaning, units of cooling and adsorption and compression, cold storages and low temperature cooling requirements, methods of automatic control.	

Expected outcomes:

1. The student will become familiar with the thermodynamic processes related to the HVAC industry.
2. The student will be able to use the ASHRAE literature and handbooks to retrieve data and information to solve HVAC problems.
3. The student will be able to estimate the cooling and heating loads on various types of buildings and systems.
4. The student will be able to estimate annual energy usage for various types of HVAC systems and buildings.
5. The student will be able to design an HVAC system by sizing the components correctly.
6. The student will be able to use load estimation software using advanced methods for HVAC analysis.
7. The student will be able to size pipe and air duct systems and select fans and pumps for those systems.

9- Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	5	• Introduction, Thermodynamic • Thermodynamic • properties of moist air with properties of moist air	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 2	5	Physiological Reaction for cooling & Heating	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	5	Psychometric chart	Have a basic information about the subject and be able to solve elementary problems.	Daily exams + monthly exams

Week 4	5	• First term exam Psychometric processes	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	5	Air & Humidity Calculations	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 6	5	Air & Humidity Calculations	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	5	Basic Air Conditioning process	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	5	Air Conditioning Cycles	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	5	Design conditioning-heat transfer coefficients	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	5	Thermal comfort-ASHRAE comfort chart	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	5	Heating load calculation	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	5	Cooling load calculation	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	5	Classification of Air duct	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	5	Design of Air ducts for air distribution systems	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	5	Ventilation & Air cleaning units.	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	Internal Combustion Engine Fundamentals by J.B. Heywood
2. Main references (sources)	Internal Combustion Engines by C.R. Ferguson
A- Recommended books and references (scientific journals, reports…).	Related e- books and papers: • Internal Combustion Engine Fundamentals by J.B. Heywood. • Internal Combustion Engines by C.R. Ferguson. • Introduction to I. C. Engines by Richard Stone. • Internal Combustion Engine Fundamentals by J.B. Heywood. • Internal Combustion Engines by C.R. Ferguson Introduction to I. C. Engines by Richard Stone.
B-Electronic references, Internet sites…	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	Aerodynamics
2. Course code	
3. Semester/Year	2nd Semester – 4th Year
4. Date of production/revision of this specification	August 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	45 hours /3 units
7. Course administrator's name (mention all, if more than one name)	Asst. Prof. Dr. Itimad D. J. Azzawi itimaddawood_eng@uodiyala.edu.iq
8. Aims of the Course	

The main goal of Aerodynamics is to introduce the students to the fundamentals of Aerodynamics and fluid slow including their Classification, configuration and working principles of Aircrafts.
Students shall be introduced to:
- Identify the main flow patterns and collect flow patterns such as uniform, circular and vorticity

- Know the basic concepts in potential flow (stream function, potential function, rotation)
- Know the basic concepts in ideal flow
- Know the Navier-Stoke ratios and their applications in viscous fluid
- Know the boundary layer theory
- Know the separation of vortices around wings

B. The skills goals special to the course.
B1 - Skills to identify flow patterns in ideal fluids
B2- Skills to identify applications of Navier-Stoke in viscous fluid
B3- Skills to solve the equations of the boundary layer and its separation in wings and methods of controlling them

C. Affective and value goals
C1- Observation and perception
C2- Analysis and interpretation
C3- Conclusion and evaluation
C4- Preparation and evaluation

9- Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	3	Principles of Aerodynamics	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 2	3	Introduction to incompressible flow	Have a basic	Daily exams +

			information about the subject and be able to solve elementary problems	monthly exams
Week 3	3	Introduction to ideal fluid flow	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	3	Equations of ideal fluid flow	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	3	Navier – Stoke Equation / Applications and CFD	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 6	3	Navier – Stoke Equation / Applications and CFD	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	3	Navier – Stoke Equation / Applications and CFD	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	3	Flow in variable area duct	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	3	Boundary Layer theory	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	3	Boundary Layer theory	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	3	Separation of Boundary Layer	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	3	Separation of Boundary Layer	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	3	Flow Separation Control	Have a basic information about the	Daily exams + monthly exams

			subject and be able to solve elementary problems	
Week 14	3	Flow Separation Control	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	3	Flow Separation Control	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	Aerodynamics For Engineering Students
2. Main references (sources)	Fundamental of aerodynamics by John D. Andrson Other related books
A- Recommended books and references (scientific journals, reports…).	Fundamental of aerodynamics by John D. Andrson Other related books
B-Electronic references, Internet sites…	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	CAE
2. Course code	ME 411
3. Semester/Year	1st Semester – 4th Year
4. Date of production/revision of this specification	Augusts 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	45 hours /2 units
7. Course administrator's name (mention all, if more than one name)	Asst. Prof. Dr. Mohammed Khudhair Abbas mohammedkhudhair_eng@uodiyala.edu.iq
8. Aims of the Course a) To revise the fundamentals of fluid mechanics by using computer. b) To lay a strong foundation for fluid flow analysis by using computer c) Design & Development of CAD/CAM/CAE Software. d) To understand the methodologies for development of CAD/CAM/CAE Software and its customization.	

❖ The skills goals special to the course.

a) Enhancing students' analytical abilities by providing an introduction to the installation of the ANSYS program and its applications in various fields of fluid mechanics.
b) And using the programs within the ANSYS program to conduct exercises and simulations of various topics related to fluid mechanics.

10. Teaching and Learning Methods

❖ Weekly lectures include: -

1. Providing students with the basics and topics related to previous learning outcomes for skills to solve practical problems through presentation, lecture or conducting experiments.
2. Solving a set of practical and applied examples by the academic staff.
3. Through discussion, students participate by solving some practical problems.
4. The department's practical laboratories are followed up by the academic staff in the department.
5. Asking the student to visit the library and the Internet to gain additional knowledge of the study materials.
6. Presenting a discussion session (Seminar) by the student in front of his fellow students to enhance his confidence.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	3	Set up Ansys software	Have a basic information about the subject and be able to solve elementary problems by using computer	Daily exams + monthly exams
Week 2	3	Introduction to Ansys software and Ansys Application	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	3	interfaces in CAD/CAM and CAE software, Use of general programming interfaces	Have a basic information about the subject and be able to	Daily exams + monthly exams

			solve elementary problems	
Week 4	3	DesignModeler Introduction	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	3	First experimental exam	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 6	3	Introduction to CFD	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	3	DesignModeler Menus DesignModeler Hotkeys	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	3	DesignModeler Menus Create Menu	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	3	Fluid Flow in A Porous Media Using Fluent	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	3	second experimental exam	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	3	Laminar Pipe Flow tutorial	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	3	Turbulent Flow Around an Airfoil	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	3	Simulating Flow in a Static Mixer Using Workbench- part 1	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	3	Simulating Flow in a Static Mixer Using Workbench- part 2	Have a basic information about the subject and be able to solve elementary	Daily exams + monthly exams

			problems	
Week 15	3	third experimental exam	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	a) ANSYS_Fluent 16 Tutorial_Guide b) DesignModeler User Guide c) Fluid Flow and Heat Transfer in a Mixing Elbow
2. Main references (sources)	ANSYS Fluent Users Guide
A- Recommended books and references (scientific journals, reports…).	Related e- books and papers: ANSYS Workbench Tutorial – Flow Over an Airfoil
B-Electronic references, Internet sites…	Introduction to Using ANSYS FLUENT Fluid Flow and Heat Transfer in a Mixing Elbow

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	Engineering Economy
2. Course code	E404
3. Semester/Year	1st Semester – 4th Year
4. Date of production/revision of this specification	Augest 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	45 hours /2 units
7. Course administrator's name (mention all, if more than one name)	Asst. Lect. Mohsen Abed Alhussein Abbas Mohsen.abbas@uodiyala.edu.iq
8. Aims of the Course	
This course aims to equip engineering students with the knowledge and skills necessary to conduct thorough financial analyses, particularly in the context of capital investment. By mastering engineering economy principles and diverse evaluation methods.	

Upon successful completion of this course, students will be able to:
• Analyze alternatives using present worth, annual worth, future worth, and rate of return methods.
• Select and apply appropriate techniques for comparing mutually exclusive alternatives.
• Select and apply appropriate techniques for evaluating independent alternatives.
• Identify relevant data for engineering economy studies.
• Evaluate public projects using the benefit/cost ratio method.
• Perform replacement studies between existing assets/systems and their alternatives.
• Determine the breakeven level of activity or parameter value.
• Utilize computer software for engineering economic analysis.

- Evaluate alternative investment options: Utilize various techniques to assess and compare different investment choices.
- Perform sensitivity analysis: Analyze how project outcomes are impacted by changes in key variables.
- Integrate financial considerations: Incorporate the effects of inflation, depreciation, and taxes into their economic analyses.
- Utilize software tools: Leverage engineering economy software for efficient and accurate calculations.
- Understand loan rates: Gain knowledge about the interest rates offered by banks for various loan options.

• Identify financial and economic project management methods: Recognize and apply appropriate financial and economic methodologies for successful project management.

9- Teaching and Learning Methods

- plan and execute experimental investigations;
- apply and describe a variety of experimental techniques;
- identify, estimate, combine and quote experimental errors and uncertainties;

10- Course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	2	1- Introduction to engineering economy. 2- The principles of engineering economy. 3- Basic Concepts of engineering economy: • Alternatives • Cash Flow	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

		• Alternative Selection • Evaluation Criteria - Time Value of Money		
Week 2	2	1- Interest rate. • The interest rate or Rate of Return (ROR) 2- Interest Paid. 3- Interest Earned. 4- Financial Mathematics. 5- Terminology and symbols': • value or amount of money @ P= Present time (Present worth) F= Future time (Future worth) • A= (Series of Amount of money) • N = Number of interest periods (years , month, days) • i = interest rate per time periods t= time, stated in periods (years , month, days)	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	2	1- Cash Flow Diagram (C-F-D) with Example 2- Using Compound Interest Tables Deposited	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	2	1- Nominal and Effective interest rate : • Monthly interest rate. • Daley interest rate. • Weekly interest rate. • Other interest rate Net Cash Flow for (month, Week, Daye)	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	2	Present worth analysis for each alternative: • MARR (Minimum Attractive Rate of Return) • F.C = first cost • O.C = operating cost • M.C= maintenance cost • S. V=salvage value • A. I=annual income • E. I=extra income E.C=extra cost	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

Week 6	2	1- Rate of Return Analysis (RRA) Single Alternative (∑pw=0)	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	2	**Midterm Exam**	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	2	Depreciation: - Straight Line Deprecation - Declining Balance method Sum of the years Deprecation	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	2	The Benefit –Cost –Analysis Depreciation: - Public Sector Projects - Benefit/Cost Analysis of a Single Project - Alternative Selection Using Incremental B/C Analysis Incremental B/C Analysis of Multiple, Mutually Exclusive Alternatives	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	2	Using (MS-Excel) software to income taxes: - Write Economy Equations - Get results and compare them with manual solutions Drawing flowcharts	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	2	Replacement and Retention Decisions: - Basics of a Replacement Study - ESL (Economic Service Life) Performing a Replacement Study	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	2	1- Breakeven Analysis: - Breakeven Analysis for a Single Project - Fixed costs (FC). - Variable costs (VC). Breakeven Analysis Between Two Alternatives	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	2	1- Benefit cost analysis Public sector economics	Have a basic information about the subject and be able to solve elementary	Daily exams + monthly exams

			problems	
Week 14	2	1- Review (what was presented during this course). Provide a set of examples.	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	2	**Review**	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	Leland T. Blank, Anthony J. Tarquin "Engineering Economy" 7th edition, McGraw-Hill International Edition, 2012.
2. Main references (sources)	Appendix C: Compound interest tables: from pp:595 -625
A- Recommended books and references (scientific journals, reports…).	• William G.Sullivan, Elin M. Wicks and James T. Luxhoj "Engineering Economy" 14th edn, Prentice Hall, 2009 • Chan S. Park, "Fundamentals of Engineering Economy" 2nd edn, Prentice Hall, 2009 • Joseph C. Hartman, "Engineering Economy and the Decision-Making Process" Prentice Hall, 2007
B-Electronic references, Internet sites…	http://www.oup.com/us/companion.websites/9780199778126/student/tables

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW:
PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

Module Information		
Module Title	ETHICS	**Module Delivery**
Module Type	**BASIC**	**Theory**

Module Code	**ME412**	**Lecture** **Tutorial**	
ECTS Credits	**2**		
SWL (hr/sem)	**30**		
Module Level	UGx11 1	**Semester of Delivery**	1
Administering Department	mechanical Engineering	**College**	Engineering
Module Leader	MSc. Yasseen Alwan Jaddoa	**e-mail**	yasseenalwan_eng@uodiyala.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	MSc
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1-Study principles of Engineering Profession Ethics . 2-Explain a basic information about Engineering Profession Ethics. 3-Use all available possibilities to explain Engineering Profession Ethics to students . 4- The field examines and sets the obligations by engineers to society. 5- It is closely related to subjects such as the

	philosophy of science, the philosophy of engineering, and the ethics of technology.
Module Learning Outcomes	A. An ability to apply knowledge of mathematics, science, and engineering. b. An ability to design and conduct experiments, as well as to analyze and interpret data. c. An ability to design a system, component, or process to meet desired needs within realistic engineering constraints d. An ability to function on multidisciplinary teams e. An ability to identify, formulate, and solve engineering problems
Indicative Contents	The topics listed under the indicative content below are the underpinning areas of knowledge and understanding that will be obtained from successful completion of the module. Have a basic information about professional ethics and engineering ethics.

Learning and Teaching Strategies	
Strategies	-plan and execute experimental investigations; -apply and describe a variety of experimental techniques; -identify, estimate, combine and quote experimental errors and uncertainties;

Student Workload (SWL)			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل **In class lectures** **15** **In class tests** **4** **Tutorial** **0** **Final Exam** **3**	22	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعي	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل **Assignment** **4** **Preparation for tests** **2**	8	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2

Homework 2			
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**30**		

Module Evaluation تقييم المادة الدراسية					
As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	Quizzes	3	20% (20)	3,5, 10, 12, 14	LO #1, 2, 3, 4 ,5 and 7
	Assignments	6	10% (10)	4, 8, 12	LO # 1, 2, 3, 4, 5 and 6
	Home Work	6	10% (10)	2,5,7,9, 11,13	LO # 1, 2, 3, 4, 5,6 and 7
	Midterm Exam	2 hr	10% (20)	7	LO # 1,4
Summative	Final Exam	3 hr	50% (50)	16	All

assessment					
Total assessment			100% (100 Marks)		

MODULE DESCRIPTION FORM

Module Information

Module Title	POWER PLANTS	**Module Delivery**	
Module Type	**BASIC**	**Theory** **Lecture** **Tutorial**	
Module Code	**ME 407**		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		

Module Level	1	**Semester of Delivery**	2
Administering Department	Mechanical Engineering	**College**	Engineering
Module Leader	Dr. Qusay Hassan	**e-mail**	qusayhassan_eng@uodiyala.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date		**Version Number**	

Relation with other Modules

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	The module objectives are designed to provide students with a comprehensive understanding of the technical and operational aspects of power generation facilities.

أهداف المادة الدراسية	This course aims to cover the various types of power plants, such as thermal, hydroelectric, nuclear, and renewable energy plants, focusing on their design, operation, and efficiency. Students learn about the key components of power plants, energy conversion processes, and the environmental impact of power generation. Additionally, the course intends to equip students with the skills to analyze and optimize plant performance, manage maintenance operations, and comply with safety and regulatory standards, preparing them for careers in the energy sector.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. **Understand the various types of power plants**: Gain a thorough knowledge of different power generation technologies including thermal, hydroelectric, nuclear, and renewable energy plants. 2. **Master technical details**: Be proficient in the technical components and operational mechanisms within a power plant, such as boilers, turbines, generators, and control systems. 3. **Analyze energy conversion processes**: Comprehend and analyze the processes involved in converting natural and renewable resources into usable energy. 4. **Evaluate environmental impacts**: Understand the environmental considerations associated with power generation, including emissions, waste management, and sustainability practices. 5. **Optimize plant performance**: Develop skills to assess and optimize the efficiency and output of power plants through various analytical and practical techniques. 6. **Apply safety and regulatory standards**: Be knowledgeable about the safety procedures and regulatory requirements that govern power plant operations. 7. **Prepare for professional challenges**: Equip with problem-solving skills to address operational challenges and innovations in the energy sector.
Indicative Contents المحتويات الإرشادية	1. **Introduction to Power Systems**: Overview of the global energy landscape, basics of electrical power generation, and the role of power plants in energy systems. 2. **Types of Power Plants**: Detailed examination of thermal (coal, gas, oil), hydroelectric, nuclear, and renewable energy plants (solar, wind, biomass). 3. **Plant Components and Operations**: Study of the core components like boilers, turbines, condensers, generators, and control systems. 4. **Energy Conversion Processes**: Analysis of the processes involved in converting different types of energy sources into electrical energy. 5. **Plant Design and Layout**: Insights into the design considerations and layout planning of various types of power plants. 6. **Environmental Impact and Sustainability**: Discussion on the environmental impacts of power generation, including emissions, cooling systems, and waste

	management, along with strategies for sustainable practices. 7. **Regulatory and Safety Standards**: Understanding of the regulatory frameworks governing power plant operations and detailed safety protocols to ensure compliance and protect personnel. 8. **Maintenance and Troubleshooting**: Techniques for routine maintenance, diagnostics, and troubleshooting issues within power plants. 9. **Innovations in Power Generation**: Exploration of new technologies and trends in power generation, such as advancements in renewable energy technologies and improvements in efficiency and emissions. 10. **Economic and Financial Aspects**: Analysis of the economic factors influencing power plant operations, including cost of production, financial management, and economic viability.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The breakdown of common learning and teaching strategies used in higher education, particularly for technical courses such as a Bachelor of Science in Power Plants: 1. **Lectures**: Traditional lectures are used to deliver theoretical knowledge and foundational concepts to large groups of students. Lecturers may use presentations, videos, and live demonstrations to explain complex topics. 2. **Tutorials and Seminars**: These smaller, interactive sessions allow for deeper discussion of lecture material, problem-solving activities, and group work. They provide students with the opportunity to ask questions and engage critically with the content. 3. **Laboratory Work**: In technical courses, hands-on laboratory sessions are crucial. For a power plant course, this might involve simulations, working with models of power plant components, or using software tools to design power plant systems. 4. **Case Studies**: Analyzing real-world scenarios enables students to apply theoretical knowledge practically. Case studies in power plant courses might focus on operational challenges, environmental impact assessments, or safety incidents. 5. **Field Trips**: Visits to actual power plants give students first-hand experience of how such facilities operate, enhancing their understanding of practical and

	operational aspects of power generation. 6. **Guest Lectures**: Industry experts and guest lecturers can provide insights into current trends, technologies, and challenges in the power industry, giving students exposure to real-world applications and future career paths. 7. **Group Projects**: These encourage collaboration and problem-solving skills. For instance, students might work together to design a section of a power plant or to propose solutions for increasing the efficiency of an existing facility. 8. **Assessments**: Regular quizzes, written assignments, project presentations, and exams are used to assess understanding, provide feedback, and encourage students to consolidate their learning.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل **In class lectures** **55** **In class tests** **5** **Tutorial** **15** **Final Exam** **3**	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعي	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل **Assignment** **20** **Preparation for tests** **30** **Homework** **22**	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	20% (20)	3,5, 10, 12, 14	LO #1, 2, 3, 4 ,5 and 7
	Assignments	6	10% (10)	4, 8, 12	LO # 1, 2, 3, 4, 5 and 6
	Home Work	6	10% (10)	2,5,7,9,11,13	LO # 1, 2, 3, 4, 5,6 and 7
	Midterm Exam	2 hr	10% (20)	7	LO # 1,4
Summative assessment	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Introduction to Power Generation:** Explore the landscape of global energy systems, focusing on the various types of power plants—thermal, hydroelectric, nuclear, and renewable. Understand the critical role power plants play in modern energy infrastructure.
Week 2	**Basics of Electrical Power Generation:** Dive into the fundamentals of electricity, energy conversion principles, and basic thermodynamics. This foundational knowledge sets the stage for understanding how power plants operate.
Week 3	**Thermal Power Plants:** Focus on thermal power plants using coal, gas, and oil. Study the main components, their operation, and the principles behind thermal efficiency and heat rates.
Week 4	**Hydroelectric Power Generation:** Learn about the mechanics and types of hydroelectric power plants, including impoundment, diversion, and pumped storage systems. Discuss their environmental impacts and operational strategies.
Week 5	**Nuclear Power Plants:** Examine nuclear power generation, including the basics of nuclear physics, core components of nuclear power plants, and the critical safety and regulatory issues associated with nuclear energy.
Week 6	**Renewable Energy Sources:** Explore renewable energy technologies such as solar (photovoltaic and concentrated), wind (onshore and offshore), biomass, and geothermal systems. Understand the technologies and their integration into the grid.
Week 7	**Power Plant Components:** Delve into the critical components of power plants, including boilers, turbines, generators, condensers, control systems, and electrical transformers.

Week 8	**Mid-Term Review and Examinations:** Review all materials covered so far with a focus on reinforcing key concepts and prepare for the mid-term examinations.
Week 9	**Plant Operations and Management:** Study the daily operations across different types of power plants and the importance of human resource management, emphasizing the use of automation and control technologies.
Week 10	**Environmental Impact and Sustainability:** Address the environmental implications of power generation, focusing on emissions, pollution control technologies, waste management, and sustainable practices.
Week 11	**Safety Practices in Power Plants:** Cover safety protocols, emergency response management, and regulatory compliance to ensure safety and operational integrity in power plants.
Week 12	**Maintenance and Troubleshooting** Learn about routine and preventive maintenance, troubleshooting common operational issues, and the principles of reliability and risk management in power plants.
Week 13	**Innovations in Power Generation:** Explore emerging technologies and advances in power generation, particularly in the field of renewable energy, and discuss future trends and potential impacts on the industry.
Week 14	**Economic and Financial Aspects:** Examine the cost analysis of power generation, the economic feasibility of various power plant types, and the influence of global energy markets on power production.
Week 15	**Final Project Presentation and Course Wrap-up:** Conclude with student presentations on group projects or individual research, providing an opportunity for discussion and feedback, and review key concepts to prepare for the final examination.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Study of modern steam power plant
Week 2	Study about the Various Types of Fuel & Ash
Week 3	Study about different types of dust collectors and pulverized fuel burners
Week 4	Study about nuclear power plant
Week 5	Study of different types of steam turbines

Week 6	Study about different types of condensers and
Week 7	Study about economics of power generation
Week 8	Study of gas power plant
Week 9	Study of combined steam & gas turbine power
Week 10	Testing of diesel fired water tube boiler based steam power plant

Learning and Teaching Resources

مصادر التعلم والتدريس

	Texts	Available in the Library?
Required Texts	Snow, D. A. (Ed.). (2001). Plant engineer's reference book. Elsevier. Rasul, M. (Ed.). (2012). Thermal power plants. BoD–Books on Demand.	yes
Recommended Texts		Yes
Websites	https://books.google.iq/books?hl=en&lr=&id=KJOoQm3fbEoC&oi=fnd&pg=PP1&dq=power+plants+engineering+book&ots=HWXVb4O_Zh&sig=w7vyVQZxBldxbJGZe_-6pO1M8d8&redir_esc=y#v=onepage&q=power%20plants%20engineering%20book&f=false	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings

	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
(0 – 49)	**F –** Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	Control and Measurement
2. Course code	MECH 421
3. Semester/Year	2st Semester –4rd Year
4. Date of production/revision of this specification	August 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	75 hours /6 units
7. Course administrator's name (mention all, if more than one name)	Prof. Dr. Arshed Abdulhamed Mohammed arshad_mohammed_eng@uodiyala.edu.iq
8. Aims of the Course	

1. Training students on the basics of analyzing the control and providing them with the necessary skills to deal with the control system
2. Assisting the student in distinguishing and developing his scientific and artistic abilities.
3. Enriching the student's skills to be able to deal with the control system with high efficiency.
4. Providing students with a way to use other modern technologies related to the educational process.

9- Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	5	Overview of the principles of control	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 2	5	Transfer Function	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	5	Transfer Function	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	5	Block Diagram	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	5	Signal Flow Graphs	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

Week 6	5	Time Domain Response	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	5	Steady State Response of Second Order System	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	5	Transient Response Specification of Second Order Control System	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	5	Transient Response Specification of Second Order Control System	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	5	Steady State Errors (E_{SS})	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	5	Stability	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	5	Root-Locus	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	5	General Measurement System	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	5	Measurement errors	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	5	Force, Torque, and Shaft Power Measurement	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure

1. Books Required reading:	• Norman S. Nise, Control Systems Engineering, 7 st Edition 2015.
2. Main references (sources)	Richshard C. Dorf. Modren control system 12 st 2011
A- Recommended books and references (scientific journals, reports…).	
B-Electronic references, Internet sites…	Modren control , https://www.amazon.com/Control-Systems-Engineering-Norman-Nise-ebook/dp/B07ZN7PKRX

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

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1. Course title	Mechanical vibrations
2. Course code	MECH 412
3. Semester/Year	1st Semester –4 rd Year
4. Date of production/revision of this specification	August 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	75 hours /4 units
7. Course administrator's name (mention all, if more than one name)	Prof. Dr. Arshed Abdulhamed Mohammed arshad_mohammed_eng@uodiyala.edu.iq
8. Aims of the Course	

1. Training students on the basics of analyzing the vibration and providing them with the necessary skills to deal with vibration problems
2. Assisting the student in distinguishing and developing his scientific and artistic abilities.
3. Enriching the student's skills to deal with the vibration measurement devices with high efficiency.
4. Providing students with a way to use other modern technologies related to the educational process.

9- Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	5	Overview of the principles of vibration	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 2	5	Vibration Analysis Procedure	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	5	Elements of the Vibrated Mathematical Model	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	5	Equations of Motion: Natural Frequency	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	5	Energy Method	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

Week 6	5	Rayleigh Method: Effective Mass	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	5	Viscously Damped Free Vibration	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	5	Response to Harmonic Excitations	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	5	Un-damped Oscillator with Excitation Frequency ≠Natural Frequency	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	5	Un-damped Oscillator with $\omega_n = \omega$ (Resonant condition)	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	5	Response of a Damped System Under Harmonic Force	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	5	Two-Degree-of- Freedom Systems	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	5	Translation System and Torsional System in two degree of freedom	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	5	Forced-Vibration Analysis in two degree of freedom	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	5	Coordinate Coupling and Principle Coordinate in two degree of freedom	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure

1. Books Required reading:	Singiresu S. Rao. Mechanical Vibration, **Prentice Hall, 2011**
2. Main references (sources)	• S. Graham Kelly,Theory and problems of mechanical vibration, McGraw Hall 1996 . Shrikant Bhave Mechanical Vibration Theory Practice
A- Recommended books and references (scientific journals, reports…).	
B-Electronic references, Internet sites…	Principles of Vibration ttps://global.oup.com/ushe/product/principles-of-vibration-9780195142464?cc=us&lang=en&https://global.oup.com/ushe/product/principles-of-vibration-9780195142464?cc=us&lang=en&

Course Specification

Third Year

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	Internal Combustion Engines
2. Course code	ME306
3. Semester/Year	1st Semester – 3rd Year
4. Date of production/revision of this specification	August 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	75 hours /3 units
7. Course administrator's name (mention all, if more than one name)	Asst. Prof. Dr. Samir Gh. Yahya samirghazi_eng@uodiyala.edu.iq
8. Aims of the Course	

The main goal of Internal Combustion Engines is to introduce the students to the fundamentals of IC Engines including their Classification, configuration and working principles of IC Engines.
Students shall be introduced to:
- Analysis of Intake and Exhaust. Measurement of fuel and air consumption, volumetric efficiency, super-charging, effect of air-fuel ratio and compression ratio on engine power & efficiency, pumping work, effect of residual gases on intake temperature, injection of fuel, carburetors/fuel injector, ignition system development, exhaust gas analysis and air pollution, control of exhaust gas contents, energy emissions.

- Fuels and Combustion. Gasoline characteristics, alcohol refining and octane & cetane rating, diesel fuel oil classification, gas turbine & jet fuel, additives, combustion equation, CNG. Theoretical flame temperature, reaction rate and flame propagation, methods of igniting fuel, auto ignition, knock and the engine variable detonation, combustion theories, ignition delay, chemical equilibrium and dissociation, energy charts for unburned air mixtures, stratified charge engine, combustion chamber requirement.
- Lubricants. Engine lubrication systems, additives for lubricants.
Engine Characteristics. Valve timing, torque & mean effective pressure, comparison of real cycles with the ideal cycle, indicated power, brake power, specific fuel consumption, heat balance sheet, relation between indicated thermal efficiency and load, SI & CI engines comparison, speed and load control in SI & CI engine, high output engines, turbocharged engines

B. The skills goals special to the course.
B1 - Learn how to deal with IC engines.
B2- Learn about the cycles of IC engines and their implementations.
B3- Familiarity with the basic concepts of the types of Internal Combustion Engines.

C. Affective and value goals
C1- Urging the student to make a profit from IC engines.
C2- Urging the student to think about the importance of dealing with different cycles and designs of IC engines and how they are connected in different ways in order to give the required features and through those features they are used.
C3- Urging the student to think and understand how to develop themself in the designing and analysis of IC engines.

9- Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how,

when, why) for specific topics.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	5	Learning the Principles of IC Engine Operation: - Engine general working principle - Combustion chamber configuration	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 2	5	Learning the Principles of IC Engine Operation:- - Classification and Some Basic Details of - Heat Engines Basic Engine Components and Nomenclature	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	5	How to measure the power output of an engine. :- Dynamometer Operation - Dry friction dynamometers - Hydraulic dynamometers - Eddy current dynamometers	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	5	THE WORKING PRINCIPLE OF ENGINES: - - Four-Stroke Spark-Ignition (SI) Engine - Two-Stroke Engine - ACTUAL ENGINES	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	5	CLASSIFICATION OF IC ENGINES: - - Cycle of Operation - Type of Fuel Used - Method of Charging - Type of Ignition - Type of Cooling - Cylinder Arrangements	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 6	5	THE FIRST LAW ANALYSIS OF ENGINE CYCLE: - - ENGINE PERFORMANCE PARAMETERS	Have a basic information about the subject and be able to solve elementary	Daily exams + monthly exams

		- Fuel-Air (F/A) or Air-Fuel Ratio (A/F)	problems	
Week 7	5	THE FIRST LAW ANALYSIS OF ENGINE CYCLE-ENGINE PERFORMANCE:- - INDICATED WORK PER CYCLE - INDICATED WORK AT PART LOAD - INDICATED WORK AT SUPERCHRGING - INDICATED POWER	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	5	Worked out Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	5	AIR-STANDARD CYCLES AND THEIR ANALYSIS: - - The Carnot Cycle - The Stirling Cycle - The Ericsson Cycle	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	5	AIR-STANDARD CYCLES AND THEIR ANALYSIS: - - The Carnot Cycle - The Stirling Cycle - The Ericsson Cycle	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	5	Worked out Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	5	Fuels and Combustion: - - Type of Fuel Used - Type of Ignition - MECHANICAL INJECTION SYSTEMS - ELECTRONIC FUEL INJECTION SYSTEM - FUNCTIONAL REQUIREMENTS OF AN INJECTION SYSTEM - Types of Injection Systems	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	5	Fuels and Combustion: - - Air fuel ratio and engine performance - Impact of air fuel ratio on engine emissions - Engine exhaust system - Rating of SI Engine Fuels - Rating of CI Engine Fuels	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	5	ENGINE FRICTION AND LUBRICATION: - - losses associated with friction - Friction due to Piston	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

		Motion BLOWBY LOSSES		
Week 15	5	Function of Lubrication: - - Oil Viscosity, Flash and Fire Points - LUBRICATION OF ENGINE COMPONENTS - Wet Sump Lubrication System - Splash System - The Splash and Pressure Lubrication System - PROPERTIES OF LUBRICANTS - ADDITIVES FOR LUBRICANTS	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	Internal Combustion Engine Fundamentals by J.B. Heywood
2. Main references (sources)	Internal Combustion Engines by C.R. Ferguson
A- Recommended books and references (scientific journals, reports…).	Related e- books and papers: 1-Internal Combustion Engine Fundamentals by J.B. Heywood 2. Internal Combustion Engines by C.R. Ferguson 3. Introduction to I. C. Engines by Richard Stone 4. Internal Combustion Engine Fundamentals by J.B. Heywood 5. Internal Combustion Engines by C.R. Ferguson 6. Introduction to I. C. Engines by Richard Stone
B-Electronic references, Internet sites…	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	Mechanics of Machines
2. Course code	ME301
3. Semester/Year	1st Semester – 3rd Year
4. Date of production/revision of this specification	Augest 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	75 hours /4 units
7. Course administrator's name (mention all, if more than one name)	Lecturer Dr. Mohammed I. Hameed mohammedismael_eng@uodiyala.edu.iq
8. Aims of the Course	

The main goal of mechanics of machines is to introduce the students to the fundamentals machines parts, working principle and relative motion
Students shall be introduced to:
Friction between unlubricated surfaces, motion on inclined plane, screw threads and efficiency, friction of pivot, collar and conical bearings, cone, plate and centrifugal clutch, belts and rope drives, chains and sprockets, bands and shoe brakes. Dead weight and spring loaded governors, effort and power, sensitivity, controlling force and stability. Gyroscope, gyroscopic stabilization. Geometry of gears, conditions for transmission of constant velocity ratio, velocity of sliding, path of contact, arc of contact, interference, simple and compound gear trains, epicyclic trains, compound epicyclical trains, torque on gear trains. Theory and applications of dynamometers.
Dynamics of engine mechanism/slider-crank mechanism. Velocity and acceleration of piston, angular velocity, acceleration. Forces and couples transmitted in a direct acting engine, velocity and acceleration diagrams, turning moment diagram, fluctuation of energy and speed. Flywheels, valve diagrams and valve gears, steering gears. Types of cams and followers, motion for a given cam profile. Balancing of rotating and reciprocating masses, balancing of in-line engines, V-engines, radial engines, balancing machines.

B. The skills goals special to the course.
B1 - Learn how to deal with machine parts relative velocity.
B2- theory and mechanisms of motion translation.
B3- Familiarity with the basic concepts of suitable environment for each types of energy, speed and torque transformation

C. Affective and value goals
C1- Urging the student to make a profit from machines design.
C2- Urging the student to think about the importance of dealing with different principle of movement translation between machine elements.
C3- Urging the student to think and understand how to develop themself in the designing and analysis of machine components.

9- Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	5	- Introduction - Kinematic chain - Quick return mechanism	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 2	5	Velocity in mechanism Instantaneous center method	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	5	-Velocity in mechanism -Relative velocity method	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	5	Velocity in mechanism -Relative velocity method - Six bar mechanism	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	5	-Belt, Rope and chain - flat belt	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 6	5	-Belt, Rope and chain - v- belt , rope and chain	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	5	-Fundamentals of gears -Involute gearing	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	5	- Speed ratio of meeting gears Worked out Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	5	Gear trains - Epicyclic gear trains	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	5	-Gear trains - sun and planet gears system	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	5	Worked out Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	5	-Balancing of rotating masses -Masses rotate in same plane	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	5	-Balancing of rotating masses -Masses rotate in different planes	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	5	Cams with knife edge follower	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	5	Cams with roller follower	Have a basic information about the subject and be able to solve	Daily exams + monthly exams

			elementary problems	

11. Infrastructure	
1. Books Required reading:	Theory of Machines by Khurmi
2. Main references (sources)	Mechanism Design Vol.1 by Erdman and Sanders
A- Recommended books and references (scientific journals, reports…).	1.Theory of Machines by J.E. Shigley 2. Design of Machinery by R. Norton
B-Electronic references, Internet sites…	

TEMPLATE FOR COURSE SPECIFICATION

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COURSE SPECIFICATION

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1. Course title	Engineering Numerical Methods
2. Course code	ME307
3. Semester/Year	1st Semester – 3rd Year
4. Date of production/revision of this specification	August 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	45 hours /2 units
7. Course administrator's name (mention all, if more than one name)	Asst. Prof. Dr. Samir Gh. Yahya samirghazi_eng@uodiyala.edu.iq
8. Aims of the Course	
The main goal of numerical analysis is to develop efficient algorithms for computing precise numerical values of mathematical quantities, including functions, integrals, solutions of algebraic equations, solutions of differential equations (both ordinary and partial), solutions of minimization problems, and so on. The objects of interest typically (but not exclusively) arise in applications, which seek not only their qualitative properties, but also quantitative numerical data	

B. The skills goals special to the course.

B1 - Learn how to deal with numerical analysis.

B2- Learn about the methods of solution of numerical analysis and their implementations.

B3- Familiarity with the basic concepts of the types of numerical analysis

C. Affective and value goals

C1- Urging the student to make a profit from the methods of solution of numerical analysis.

C2- Urging the student to think about the importance of dealing with different methods of solution of numerical analysis

C3- Urging the student to think and understand how to develop themself in the designing and analysis of numerical solutions using MATLAB.

9- Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	3	Learning the process of the Bisection method for finding the roots when two initial roots are given	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 2	3	Learning the formula/process of the Fixed Point Iteration method for finding the roots after estimating the initial root	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	3	Learning the formula/process of theFixed Point Iteration method for finding the roots after estimating the initial root	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	3	Newton's (or Newton-Raphson)	Have a basic	Daily exams +

		method can be used to approximate the roots of any linear or nonlinear equation of any degree. This is an iterative (repetitive procedure)	information about the subject and be able to solve elementary problems	monthly exams
Week 5	3	Learning the formula/process of the Secant method for finding the roots after estimating the initial root	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 6	3	Integration By Numerical Methods: the trapezoidal rule that computes a function f(x) with a set of linear functions	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	3	introduction to numerical methods for integrating functions which are very difficult or impossible to integrate using analytical means - Simpson's rule that computes a function f(x) with a set of quadratic functions.	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	3	Integration By Numerical Methods: - Double Integral: Integration By Numerical Methods: Trapezoidal and Simpson's rules - The trapezoidal rule that computes a function f(x) with a set of linear functions	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	3	Systems of Linear Algebraic Equations….. Direct Methods 1-Solution Using Inverse Of Matrix. 2-Gauss Elimination 3-Gauss – Jordan Elimination	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	3	Systems of Linear Algebraic Equations….. **Direct Methods/Extra examples** 1-Solution Using Inverse Of Matrix. 2-Gauss Elimination 3-Gauss – Jordan Elimination	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	3	Systems of Linear Algebraic Equations….. **Indirect Methods:** 1-Iterative method (Jacobi method) 2- Gauss – Seidel method	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

Week 12	3	Interpolation and Curve Fitting: - Polynomial Interpolation Lagrange's Method	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	3	Interpolation and Curve Fitting: - Newton's Method Evaluation of polynomial	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	3	Numerical differentiation: - Finite difference formulas - Two and Three points formulas Forward, Central and backward difference approximations	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	3	Numerical differentiation: - Finite difference formulas - Two and Three points formulas - Forward, Central and backward difference approximations Extra examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	Advanced Engineering Mathematics : Larry Turyn
2. Main references (sources)	NUMERICAL METHODS IN ENGINEERING WITH MATLAB : Jaan Kiusalaas - The Pennsylvania State University
A- Recommended books and references (scientific journals, reports…).	Related e- books and papers
B-Electronic references, Internet sites…	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	Fluid Dynamics II
2. Course code	**ME304**
3. Semester/Year	1st Semester – 3rd Year
4. Date of production/revision of this specification	August 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	75 hours /3 units
7. Course administrator's name (mention all, if more than one name)	Asst. Prof. Dr. Itimad D. J. Azzawi itimaddawood_eng@uodiyala.edu.iq
8. Aims of the Course	

The main goal of Fluid dynamics is to introduce the students to the fundamentals of gas dynamics and turbomachinery in addition and fluid slow including their Classification, configuration and working principles of Aircrafts.
Students shall be introduced to:
- Identify the basic definitions related to compressible and incompressible flow
- Know the basic concepts in potential flow (stream function, potential function, rotation)
- Perform calculations related to compressible and isentropic flow
- Identify the types of flow (subsonic flow, sonic flow, ultrasonic flow)
- Understand and define vertical and oblique shock waves
- Identify the flow with the effect of friction and the transmission of the tractor (Fano + Raleigh flow)
- Identify the turbine machines and pumps of all types
- Identify the distribution of speeds on the turbine shaft and gas and steam pumps

B. The skills goals special to the course.

B1 - Skills for general principles of compressible fluid flow compared to incompressible

B2- Skills for calculating one-dimensional isentropic flow with variable area.

B3- Skills for vertical and inclined shocks

B4- Skills for obtaining the best design for nozzles, diffusers, jet propulsion, constant area flow (Fano line flow and Relay line flow).

B5- Skills for obtaining the best design for pumps and how to choose them in projects and water plans as well as speed calculations for gas and steam turbines

C. Affective and value goals

C1- Observation and perception

C2- Analysis and interpretation

C3- Conclusion and evaluation

C4- Preparation and evaluation

9- Teaching and Learning Methods

- Providing students with the basics, additional topics, and field experiences related to the outcomes of thinking and analysis.
- Forming discussion circles during or outside lectures to discuss scientific engineering topics that require thinking and analysis.
- Asking students, a set of thinking questions during lectures, such as (what, how, when, why) for specific topics.

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method

Week 1	5	Principles of thermodynamics	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 2	5	Introduction to compressible flow	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	5	Introduction to compressible flow and speed of sound	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	5	Equations of Isentropic flow and tables	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	5	Normal shock wave	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 6	5	Oblique shock wave	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	5	Flow in variable area duct	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	5	Flow in variable area duct	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	5	Flow ducts with heating or cooling	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	5	Flow ducts with friction	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	5	Introduction to Turbomachinery	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 12	5	Pumps and Turbines	Have a basic	Daily exams +

			information about the subject and be able to solve elementary problems	monthly exams
Week 13	5	Axial and Centrifugal Pumps	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	5	Steam and Gas Turbines	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	5	Steam and Gas Turbines	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	Gas Dynamics by James John and Theo Kith Lecture notes of the teacher
2. Main references (sources)	Fundamental of aerodynamics by John D. Andrson Turbomachinery by Frank M. White Other related books
A- Recommended books and references (scientific journals, reports…).	Turbomachinery by Frank M. White Other related books
B-Electronic references, Internet sites…	

TEMPLATE FOR COURSE SPECIFICATION

HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the program specification.

1. Course title	Engineering Analysis
2. Course code	ME303
3. Semester/Year	1st Semester – 3rd Year
4. Date of production/revision of this specification	Augest 2024
5. Modes of Attendance offered	Class Lectures
6. Number of Credit Hours (Total) / Number of Units (Total)	45 hours /2 units
7. Course administrator's name (mention all, if more than one name)	Lecturer Khuder N Abed khudernajim_eng@uodiyala.edu.iq
8. Aims of the Course	

The main goal of "Engineering Analysis" is to teach students the methods of solving advanced engineering mathematics and to learn about engineering mathematics.

Students will be introduced to:

- Analytical methods for solving mechanical vibrations and heat transfer applications.
- Fundamental principles of advanced engineering analysis.

B. The skills goals special to the course.

- Enable students to use mechanical engineering science in both theoretical and practical aspects.
- Improve students' ability to analyze information and interpret data obtained from practical experiments.
- Enable students to use specific equations for course materials to analyze problems and extract accurate results.
- Enable students to conduct field surveys to identify problems faced by engineers in workshops or laboratories.

C. Affective and value goals

Develop the ability to analyze results obtained through practical experiments.

9- Teaching and Learning Methods

- Weekly lectures that cover the basics and related topics of learning outcomes.
- Practical examples and applications solved by academic staff.
- Discussion sessions where students solve practical problems.
- Encouraging students to visit libraries and use the internet for additional knowledge.
- Student seminars to boost confidence..

10- course strategy

Week	Hours	Unit/Module or Topic Title	Teaching Method	Assessment Method
Week 1	3	- First Order Differential Equations, background to Ordinary Differential Equations, Some Problems Leading to Ordinary Differential Equations. - Method of solution of	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

		first-order differential equations, Separable Equations, Examples, Homogeneous Equations, Examples		
Week 2	3	Exact Equations, Examples, Integrating Factors, Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 3	3	Exact Equations, Examples, Integrating Factors, Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 4	3	Linear First Order Equations, Examples, The Bernoulli Equation, Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 5	3	Special case , The Solution Of Differential Equations By Replacement The Variables, Examples , when the coefficients of dx and dy are linear functions and have two variables in equation, Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 6	3	Homogeneous Linear Higher Order Constant	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 7	3	Coefficient Equations, Examples.	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 8	3	Undetermined Coefficients: Particular Integrals, Cauchy–Euler Equation, Variation of Parameters.	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 9	3	Introduction to Fourier Series, Convergence of Fourier Series and Their Integration and Differentiation, Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 10	3	Fourier Sine and Cosine Series, Other Forms of Fourier Series, Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 11	3	Fourier Series of Even and Odd	Have a basic	Daily exams +

		Functions (Examples). Half – Range Expansions Series (Examples)	information about the subject and be able to solve elementary problems	monthly exams
Week 12	3	Laplace Transform: Fundamental Ideas, Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 13	3	Inverse transform ,Examples, transform of derivatives and integrals ODEs, Examples	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 14	3	Differentiation and integration of transforms, Examples.	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams
Week 15	3	Laplace Transform : general formulas , Examples.	Have a basic information about the subject and be able to solve elementary problems	Daily exams + monthly exams

11. Infrastructure	
1. Books Required reading:	Advanced Engineering Mathematics (Erwin Kreyszig) , Wiley International edition.
2. Main references (sources)	Advanced Engineering Mathematics (Erwin Kreyszig) , Wiley International edition.
A- Recommended books and references (scientific journals, reports…).	Related books and magazines
B-Electronic references, Internet sites…	

Course Specification

Second and First Year

Ministry of Higher Education and Scientific Research - Iraq
University of Diyala
College of Engineering
Department of mechanical Engineering

المحلق رقم 4

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Mechanical Drawing and CAD			**Module Delivery**	
Module Type	**BASIC**			**Practical Lecture**	
Module Code	**ME 208**				
ECTS Credits	**2**				
SWL (hr/sem)	90				
Module Level	2		**Semester of Delivery**	2	
Administering Department	mechanical Engineering		**College**	Engineering	
Module Leader	Asst. Lec. Akram Mahdi Abed		**e-mail**	akram_mahdi_eng@uodiyala.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Enable to understand mechanical engineering systems those are technically viable, economically feasible and socially acceptable to enhance quality of life. 2. Apply modern tools and techniques to solve problems in mechanical and allied engineering streams. 3. Communicate effectively using innovative tools, to demonstrate leadership and entrepreneurial skills. 4. Be a professional having ethical attitude with multidisciplinary approach to achieve self and organizational goals. 5. Utilize the best academic environment to create opportunity to cultivate lifelong learning skills needed to succeed in profession.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1:-Apply the acquired knowledge in design, thermal, manufacturing and interdisciplinary areas for solving industry and socially relevant problems. 2:-To enhance the abilities of students by imparting knowledge in emerging technologies to make them confident mechanical engineers.
Indicative Contents المحتويات الإرشادية	The topics listed under the indicative content below are the underpinning areas of knowledge and understanding that will be obtained from successful completion of the module. The mathematical topics are illustrated in the context of relevant engineering scenarios. •Definition of vectors in 2D and 3D, Physical examples, Analytical and graphical vector additions and subtractions. •Scalar and vector products, Analytical methods and graphical interpretation. •Resultant and equivalence of 2D force system, Analytical and graphical solutions. •Resultant and equivalence of 3D force system, Systems with couples Analytical solutions. •Concept of free body diagram (FBD), Equilibrium of rigid bodies, Equations of equilibrium in space

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	-plan and execute experimental investigations; -apply and describe a variety of experimental techniques; -identify, estimate, combine and quote experimental errors and uncertainties;

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل **In class lectures** **90** **In class tests** **6** **Tutorial** **15** **Final Exam** **3**	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعي	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل **Assignment** **20** **Preparation for tests** **30** **Homework** **22**	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	Quizzes	3	20% (20)	3,5, 10, 12, 14	LO #1, 2, 3, 4 ,5 and 7

	Assignments	6	10% (10)	4, 8, 12	LO # 1, 2, 3, 4, 5 and 6
	Home Work	6	10% (10)	2,5,7,9,11,13	LO # 1, 2, 3, 4, 5,6 and 7
	Midterm Exam	2 hr	10% (20)	7	LO # 1,4
Summative assessment	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, Classification Of Drawings , Review Isometric Drawings, 3D(Orthographic Drawings), Kinds of Sectional Drawing and Hatching, CAD: Introduction in CAD (SOLIDWORKS).
Week 2	Types of Threads And Fasteners Drawings, Representation of Threads CAD: Learnt how to start a SOLIDWORKS session, Understood SOLIDWORKS user interface
Week 3	Bolts and Nuts Drawing. CAD: Learned about sketch entities and sketch tools in SOLIDWORKS.
Week 4	Springs and Keys Drawings. CAD: Used the sketch tools to modify sketch entities in order to produce parts.
Week 5	Rivets and Riveted Joints. CAD: Learned about Features tools in SOLIDWORKS and how to create (3D) objects using Extrusion and Revolved Features tools
Week 6	Details and Assembly Drawing. CAD: Learned how to create 3D objects using Lofted and Swept Features tools
Week 7	Mid Term Exam
Week 8	Bearing Types and Bearing Drawing. CAD: Learned how to use Modification Features tools and how to Edit Features.
Week 9	Pipe joints drawing.

	CAD: Learned how to utilize sketch tools, mirror, and draft for part modeling.
Week 10	Shaft Couplings Types and shaft coupling drawing. CAD: Learned how to utilize sketch tools, shell, and rib for part modeling.
Week 11	Exam
Week 12	Welding types drawing. CAD: Learned how to mate components in an assembly.
Week 13	Gears Drawing. CAD: Learned how to use the exploded view assembly tool.
Week 14	Tolerance System. CAD: Learned how to create a new drawing template and Learned how to insert and position views on a drawing
Week 15	**review**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Texts	**Available in the Library?**
Required Texts	Machine Drawing –K.L.Narayana, P.Kannaiah & K.	yes

	Venkata Reddy / New Age/ Publishers Introduction to SOLIDWORKS A Comprehensive Guide with Applications in 3D Printing	
Recommended Texts	Machine Drawing / N.D. Bhatt / Charotar	Yes
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

((استمارة الخطة التدريسية السنوية))

استمارة وصف البرنامج الاكاديمي للكليات و المعاهد

الاستمارة الخاصة بنموذج وصف المقرر لكل تدريسي

الاسم الثلاثي :مازن محمود يحيى
اللقب العلمي :مدرس
تاريخ اعداد هذا الوصف :2024\06\09
اسم و رمز المقرر : ME204 – Engineering of Metallurgy

مخطط مهارات المنهج																										
يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم																										
			مخرجات التعلم المطلوبة من البرنامج																							
السنة / المستوى	رمز المقرر	اسم المقرر	أساسي أم اختياري	المعرفية (أ)				ف المهاراتية الخاصة بالبرنامج (ب)								الوجدانية والقيمية (ج)								العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي) (د)					
				أ 1	أ2			ب1	ب2	ب3	ب4	ج1	ج2	ج3		د1	د2	د3	د4							
الثاني	ME 204	Engineering of Metallurgy	اساسي	x	x							x	x	x		x	x	x	x							

جمهورية العراق
وزارة التعليم العالي و البحث العلمي
جهاز الاشراف التقويم العلمي

أسم الجامعة: جامعة ديالى
أسم الكلية : كلية الهندسة
أسم القسم: الهندسة الميكانيكية
أسم المحاضر : مازن محمود يحيى
اللقب العلمي: مدرس
المؤهل العلمي: دكتوراه / هندسة ميكانيكية
مكان العمل: قسم الهندسة الميكانيكية

نموذج وصف المقرر

وصف المقرر

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهناً عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج.

1. المؤسسة التعليمية	كلية الهندسة
2. القسم العلمي / المركز	قسم الميكانيك
3. اسم / رمز المقرر	معادن ME 204
4. أشكال الحضور المتاحة	اسبوعي
5. الفصل / السنة	فصلي
6. عدد الساعات الدراسية (الكلي)	60
7. تاريخ إعداد هذا الوصف	2024-06-09
8. أهداف المقرر	
The Course Aiming to Present of the Principles of Materials Science and Materials Engineering and Its Important in Applications of The Mechanical Engineering and Industrials of The Mechanical Engineering and Industrials for Junior Students .	

9. خرجات المقرر وطرائق التعليم والتعلم والتقييم

أسم الجامعة: جامعة ديالى
أسم الكلية : كلية الهندسة
أسم القسم: الهندسة الميكانيكية
أسم المحاضر : مازن محمود يحيى
اللقب العلمي: مدرس
المؤهل العلمي: دكتوراه / هندسة ميكانيكية
مكان العمل: قسم الهندسة الميكانيكية

أ- الأهداف المعرفية

أ2- تعزيز القدرات التحليلية للطلبة من خلال اعطاء مقدمة عن مبادئ واساسيات المواد المعدنية وانواعها ز ومن ثم دراسة انواع المعادن وطرق تشكيلها اضافة الى الظواهر والمشاكل التي يمكن ان تحصل لها اثناء فشلها وطرق المعالجة.

ب - الأهداف المهاراتية الخاصة بالمقرر.

- دراسة المبادئ الاساسية للمعادن وتشكيلها وطرق استخلاصها.

طرائق التعليم والتعلم

محاضرات اسبوعية تتضمن

- ☐ تزويد الطلبة بالأساسيات و المواضيع المتعلقة بمخرجات التعليم السابقة للمهارات لحل المشاكل العملية عن طريق الالقاء او المحاضرة او اجراء التجارب.
- ☐ حل مجموعة من الامثلة العملية و التطبيقية من قبل الكادر الاكاديمي.
- ☐ عن طريق المناقشة يتم مشاركة الطلبة عن طريق حل بعض المشاكل العملية .
- ☐ يتم متابعة المختبرات العملية الخاصة بالقسم من قبل الكادر الاكاديمي بالقسم.
- ☐ مطالبة الطالب بزيارة المكتبة و شبكة المعلومات الدولية (الانترنيت) للحصول على معرفة اضافية للمواد الدراسية .

تقديم حلقة نقاشية (Seminar) من قبل الطالب امام زملائه الطلبة لتعزيز الثقة لدية .

طرائق التقييم

- ☐ تقييم الطلبة بشكل فردي عن طريق اعطاء فرصة للمشاركة الصفية من خلال الاجابة على الاسئلة .
- ☐ تقييم الطلبة بشكل جماعي عن طريق امتحانات يومية بأسئلة عملية و نظرية .
- ☐ تقييم الطلبة بشكل جماعي عن طريق اعطاء واجبات لا صفية مثل كتابة التقارير الخاصة او تلك التي تخص التجارب العملية في المختبرات .

امتحانات فصلية للمنهج الدراسي اضافة الى امتحان نصف السنة و الامتحانات النهائية للدور الاول والثاني

أسم الجامعة: جامعة ديالى
أسم الكلية : كلية الهندسة
أسم القسم: الهندسة الميكانيكية
أسم المحاضر : مازن محمود يحيى
اللقب العلمي: مدرس
المؤهل العلمي: دكتوراه / هندسة ميكانيكية
مكان العمل: قسم الهندسة الميكانيكية

ج- الأهداف الوجدانية والقيمية

ج1- تحليل النتائج التي يحصل عليها الطالب من خلال اجراء التجارب العملية و التوصل الى مدى حقيقتها من خلال .

ج1- الملاحظة والادراك
ج2- التحليل والتفسير
ج3- الاستنتاج والتقييم

طرائق التعليم والتعلم

- استخدام الوسائل الحديثة في عرض الجانب العلمي و النظري مثل اجهزة Data Show لجذب النظر وشد الطلبة بشكل شيق عن طريق عرض بعض الافلام ذات العلاقة بالموضوع لتصل الفكرة بشكل افضل الى الطالب.
- اعطاء الطلبة واجبات لا صفية تتطلب منهم بذل مهارات و تفسيرات ذاتية بطرق اختبارية .
- الاستجواب للطبة من خلال الحلقات النقاشية عن طريق طرح الاسئلة التفكيرية (كيف ، لماذا ، متى ، اين ، اي) لمواضيع محددة .
- استخدام اسلوب عصف الذهن و التغذية الراجعة من اجل تفعيل الخبرات المتراكمة لدى الطلبة من خلال ربط ما تم اخذه من مواد دراسية في المراحل الدراسية السابقة وربطها بالجديدة .

اكساب الطلبة المهارات العملية من خل اجراء التجارب العملية على الاجهزة المختبرية

طرائق التقييم

امتحانات يومية وفصلية وتقييم المشاركات اليومية وانجاز الواجب البيتى ويكون توزيع الدرجات حسب امتحانات يومية وفصلية وتقييم المشاركات اليومية وانجاز الواجب البيتى وتكون الدرجات على شكل

1-1 40 % امتحانات فصلية ، يؤخذ بنظر الاعتبار المواظبة و المشاركة .

2 60% للفقرة (1-1) اختبارات نهائية فصلية

جمهورية العراق
وزارة التعليم العالي و البحث العلمي
جهاز الاشراف التقويم العلمي

أسم الجامعة: جامعة ديالى
أسم الكلية : كلية الهندسة
أسم القسم: الهندسة الميكانيكية
أسم المحاضر : مازن محمود يحيى
اللقب العلمي: مدرس
المؤهل العلمي: دكتوراه / هندسة ميكانيكية
مكان العمل: قسم الهندسة الميكانيكية

د - المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).
د1- تمكين الطلبة من العلوم الهندسية الميكانيكية في جوانبها التطبيقية و المعرفية .
د2- تطوير قدرة الطالب في تحليل المعلومات و تفسير البيانات التي حصل عليها من خلال اجراء التجارب العملية او استخدام المهارات اليدوية او باستخدام الحاسوب.
د3- تمكين الطالب من استخدام المعادلات الخاصة و العامة للمواد الدراسية وكيفية الاستفادة منها في تحليل المسائل و استخراج النتائج بشكل دقيق.
د4- تمكين الطالب من اجراء المسح الميداني لتحديد المشاكل التي تقع على كاهل المهندس داخل الورشة او المعمل .

اسم التدريسي:	Mazin Mahmood Yahya مازن محمود يحيى
البريد الالكتروني:	mazinmahmood@uodiyala.edu.iq
اسم المادة:	Engineering of Metallurgy
مقرر الفصل:	4 Hrs. per Week , Theory 3 Hrs. , Tutorial 1
التفاصيل الأساسية للمادة:	Course Description : 1.Introduction to Materials Science Engineering . 2.Classification of Engineering Materials . 3.Structure of Metals :Crystalline Structure of Metals . 4. Atomic Structure and Bonding . 5. Thermal Equilibrium Diagrams . 6. The Iron | Carbon Phase Diagram . 7.Cast Iron. 8. Alloy Steel and Classification of Alloy Steel . 9. Heat Treatment . 10. Non Ferrous Alloy.
الكتب المنهجية:	Material Science and Technology by W- Bolten

أسم الجامعة: جامعة ديالى
أسم الكلية : كلية الهندسة
أسم القسم: الهندسة الميكانيكية
أسم المحاضر : مازن محمود يحيى
اللقب العلمي: مدرس
المؤهل العلمي: دكتوراه / هندسة ميكانيكية
مكان العمل: قسم الهندسة الميكانيكية

جمهورية العراق
وزارة التعليم العالي و البحث العلمي
جهاز الاشراف التقويم العلمي

المصادر الخارجية:	Materials and Processes In Manufacturing by E. P Degarmo . Text Book. Engineering Material And Metallurgy . Text Book . Er.Aman Deep Singh Wadhwa – Er. Harvinder Singh Dhaliwal , 2012 Process and Materials of Manufacturing by Lindberg . Foundation of Materials And Engineering William F. Smith – Javad Hashemi

تقديرات الفصل:	الفصل الدراسي	السعي السنوي	الامتحان النهائي	Total
	Course	% 40	% 60	% 100

* تملئ الاستمارة بواسطة برنامج MS-Word.
* تنشر الاستمارة على موقع الجامعة الالكتروني على شبكة الانترنت بصيغة ملف PDF.

جمهورية العراق
وزارة التعليم العالي و البحث العلمي
جهاز الاشراف التقويم العلمي

أسم الجامعة: جامعة ديالى
أسم الكلية : كلية الهندسة
أسم القسم: الهندسة الميكانيكية
أسم المحاضر : مازن محمود يحيى
اللقب العلمي: مدرس
المؤهل العلمي: دكتوراه / هندسة ميكانيكية
مكان العمل: قسم الهندسة الميكانيكية

جدول الدروس الاسبوعي – الفصل الدراسي الاول

الاسبوع	المادة النظرية	الملاحظات
1.	Classification of Introduction To Material Science and Engineering Engineering Materials , Properties of Engineering Materials.	
2.	Structure of Metals : Crystalline Structure of Metals . Grains and Grain Boundaries ,.	
3.	Nucleation and Dentritic Growth , Influence of Solidification Conditions on Structure and Properties . Defection cast Metals.	
4.	Thermal Equilibrium Diagrams : Cooling curves , Solid Solution Alloys , Factors Affecting Solid Solubility , Solid State Diffusion ,	
5.	Thermal Equilibrium Diagrams of A binary Alloy Showing Complete Solid Solubility , Effect of Cooling Rate , The Inverse Lever Rule	
6.	Equilibrium Diagram of A binary Alloy Showing in Complete In The Solid State . Partial Solubility in The Solid State , Solubility Intermediate Phases Allotropy of Iron .	
7.	The Iron | Carbon Phase Diagram .The Effect of Rapid Cooling , The Eutectoid Reaction , The Peritectic Diagram , Plain Carbon Steels.	
8.	Mechanical properties Microstructures , Classification of plain Carbon Steel and Uses , Relationship Between Carbon Content ,	
9.	Microstructures and Mechanical Properties, Effect of Some Elements (Manganese , Silicon , Sulphur , Phosphourst.).	
10.	Cast Iron : Microstructures and Mechanical Properties , White Cast iron , Gray Malleable Cast Iron , The Production of Malleable Cast Iron .	
11.	Alloy Steel and Classification of Alloy Steel . Stainless Steels and Its Alloys and Application .	

* تملئ الاستمارة بواسطة برنامج MS-Word.
* تنشر الاستمارة على موقع الجامعة الالكتروني على شبكة الانترنت بصيغة ملف PDF.

أسم الجامعة: جامعة ديالى
أسم الكلية : كلية الهندسة
أسم القسم: الهندسة الميكانيكية
أسم المحاضر : مازن محمود يحيى
اللقب العلمي: مدرس
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مكان العمل: قسم الهندسة الميكانيكية

	Heat Treatment : Heat Treatment Processes Stress Relieving , Annealing Full Annealing Incomplete Annealing , Isothemal Annealing Diffusion Annealing (Homogenizing) Annealing of Casting Spherioidosing of Cementite ,	12
	Normalization , Hardening , Thermal Trement of Steel and the use of Schemes TTT. Hardening of Tool Steel , Martempening , Austempering , Heating Media , Heating Rate and heating Time , Tempering , Hardenability , Surface Steel Treatment of Steel , Carburizing of Steel , Heat Treatment After Carburizing Nitriding , Heat Treatment of AL Alloys .	13
	Magnesium and Its Alloys , Properties and use and Application , Titanius and its Alloys , Properties and Uses and Application .	14
	Nickel and Its Alloys , Properties and use and Application , Special Purpose Alloy, Classification and Application.	15

استمارة وصف البرنامج الاكاديمي للكليات و المعاهد

الاستمارة الخاصة بنموذج وصف المقرر لكل تدريسي

الاسم الثلاثي : محمد اسماعيل حميد
اللقب العلمي :مدرس
تاريخ اعداد هذا الوصف :09\06\2024
اسم و رمز المقرر : Mechanics of Machines ME301

مخطط مهارات المنهج																							
يرجى وضع اشارة في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم																							
			مخرجات التعلم المطلوبة من البرنامج																				
السنة / المستوى	رمز المقرر	اسم المقرر	أساسي أم اختياري	المعرفية (أ)				المهاراتية الخاصة بالبرنامج (ب)								الداف الوجدانية والقيمية (ج)								ات العامة والتأهيلية المنقولة(المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي) (د)							
				أ 1	أ 2			ب 1	ب 2	ب 3	ب 4					ج 1	ج 2	ج 3		د 1	د 2	د 3	د4		
الثالث	ME306	Internal Combustion Engines	اساسي	x	x											x	x	x		x	x	x	x		

نموذج وصف المقرر

وصف المقرر

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهناً عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج.؛

1. المؤسسة التعليمية	كلية الهندسة
2. القسم العلمي / المركز	قسم الميكانيك
3. اسم / رمز المقرر	Mechanics of Machines ME301
4. أشكال الحضور المتاحة	اسبوعي
5. الفصل / السنة	فصلي
6. عدد الساعات الدراسية (الكلي)	75
7. تاريخ إعداد هذا الوصف	9/6/2024

8. أهداف المقرر

The main goal of Mechanics of Machines is to introduce the students to the fundamentals of machines elements including their **Classification, configuration and working principles of machines parts.**

Students shall be introduced to:

Friction between un lubricated surfaces, motion on inclined plane, screw threads and efficiency, friction of pivot, collar and conical bearings, cone, plate and centrifugal clutch, belts and rope drives, chains and sprockets, bands and shoe brakes. Dead weight and spring loaded governors, effort and power, sensitivity, controlling force and stability. Gyroscope, gyroscopic stabilization. Geometry of gears, conditions for transmission

of constant velocity ratio, velocity of sliding, path of contact, arc of contact, interference, simple and compound gear trains, epicyclic trains, compound epicyclical trains, torque on gear trains. Theory and applications of dynamometers.
Dynamics of engine mechanism/slider-crank mechanism. Velocity and acceleration of piston, angular velocity, acceleration. Forces and couples transmitted in a direct acting engine, velocity and acceleration diagrams, turning moment diagram, fluctuation of energy and speed. Flywheels, valve diagrams and valve gears, steering gears. Types of cams and followers, motion for a given cam profile. Balancing of rotating and reciprocating masses, balancing of in-line engines, V-engines, radial engines, balancing machines.

10.مخرجات المقرر وطرائق التعليم والتعلم والتقييم

أ- الأهداف المعرفية

أ2- تعزيز القدرات التحليلية للطلبة من خلال اعطاء مقدمة عن مبادئ واساسيات عمل المكائن وماهي الماكنة واهميتها واجزاءها وكيفية نقل الحركة بين الاجزاء والنظريات والقوانين التي من خلالها يتم انجاز الشغل والحصول على السرع المطلوبه

ب - الأهداف المهاراتية الخاصة بالمقرر.
- دراسة المبادئ الاساسية للمكائن والية نقل الحركة بين اجزاءها

طرائق التعليم والتعلم

محاضرات اسبوعية تتضمن
- تزويد الطلبة بالأساسيات و المواضيع المتعلقة بمخرجات التعليم السابقة للمهارات لحل المشاكل العملية عن طريق الالقاء او المحاضرة او اجراء التجارب.
- حل مجموعة من الامثلة العملية و التطبيقية من قبل الكادر الاكاديمي.
- عن طريق المناقشة يتم مشاركة الطلبة عن طريق حل بعض المشاكل العملية .
- يتم متابعة المختبرات العملية الخاصة بالقسم من قبل الكادر الاكاديمي بالقسم.
- مطالبة الطالب بزيارة المكتبة و شبكة المعلومات الدولية (الانترنيت) للحصول على معرفة اضافية للمواد الدراسية .

تقديم حلقة نقاشية (Seminar) من قبل الطالب امام زملائه الطلبة لتعزيز الثقة لدية .

طرائق التقييم
☐ تقييم الطلبة بشكل فردي عن طريق اعطاء فرصة للمشاركة الصفية من خلال الاجابة على الا سئلة . ☐ تقييم الطلبة بشكل جماعي عن طريق امتحانات يومية بأسئلة عملية و نظرية . ☐ تقييم الطلبة بشكل جماعي عن طريق اعطاء واجبات لاصفية مثل كتابة التقارير الخاصة او تلك التي تخص التجارب العملية في المختبرات . امتحانات فصلية للمنهج الدراسي اضافة الى امتحان نصف السنة و الامتحانات النهائية للدور الاول والثاني
ج- الأهداف الوجدانية والقيمية ج1- تحليل النتائج التي يحصل عليها الطالب من خلال اجراء التجارب العملية و التوصل الى مدى حقيقتها من خلال . ج1- الملاحظة والادراك ج2- التحليل والتفسير ج3- الاستنتاج والتقييم
طرائق التعليم والتعلم
☐ استخدام الوسائل الحديثة في عرض الجانب العلمي و النظري مثل اجهزة Data Show لجذب النظر وشد الطلبة بشكل شيق عن طريق عرض بعض الافلام ذات العلاقة بالموضوع لتصل الفكرة بشكل افضل الى الطالب. ☐ اعطاء الطلبة واجبات لاصفية تتطلب منهم بذل مهارات و تفسيرات ذاتية بطرق اختبارية . ☐ الاستجواب للطبة من خلال الحلقات النقاشية عن طريق طرح الاسئلة التفكيرية (كيف ، لماذا ، متى ، اين ، اي) لمواضيع محددة . ☐ استخدام اسلوب عصف الذهن و التغذية الراجعة من اجل تفعيل الخبرات المتراكمة لدى الطلبة من خلال ربط ما تم اخذه من مواد دراسية في المراحل الدراسية السابقة وربطها بالجديدة . اكساب الطلبة المهارات العملية من خل اجراء التجارب العملية على الاجهزة المختبرية
طرائق التقييم
امتحانات يومية وفصلية وتقييم المشاركات اليومية وانجاز الواجب البيتى ويكون توزيع الدرجات حسب امتحانات يومية وفصلية وتقييم المشاركات اليومية وانجاز الواجب البيتى وتكون الدرجات على شكل

1-1 40 % امتحانات فصلية ، يؤخذ بنظر الاعتبار المواظبة و المشاركة . 2 60% للفقرة (1-1) اختبارات نهائية فصلية
د - المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي). د1- تمكين الطلبة من العلوم الهندسية الميكانيكية في جوانبها التطبيقية و المعرفية . د2- تطوير قدرة الطالب في تحليل المعلومات و تفسير البيانات التي حصل عليها من خلال اجراء التجارب العملية او استخدام المهارات اليدوية او باستخدام الحاسوب. د3- تمكين الطالب من استخدام المعادلات الخاصة و العامة للمواد الدراسية وكيفية الاستفادة منها في تحليل المسائل و استخراج النتائج بشكل دقيق. د4- تمكين الطالب من اجراء المسح الميداني لتحديد المشاكل التي تقع على كاهل المهندس داخل الورشة او المعمل .

11.بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة / أو الموضوع	طريقة التعليم	طريقة التقييم
الاول	5	Have a basic information about the subject and be able to solve elementary problems	- Introduction - Link - Quick return mechanism	1- الشرح والتوضيح -- طريقة عرض النموذج داخل الكلاس 3-الدرس طريقة المشاركة	
الثاني	5		- Velocity in Mechanisms (Instantaneous Centre Method - 4-bar mechanism		
الثالث	5		- Velocity in Mechanisms (Instantaneous Centre Method - 6-bar mechanism		
الرابع	5		- Velocity in Mechanisms (relative velocity method 4-bar mechanism		
الخامس	5		- Velocity in Mechanisms (relative velocity method 6-bar mechanism		
السادس	5		- belts - velocity ratio		

السابع	5		- Flat belt	
الثامن	5		V- belt and rope	
التاسع	5		- chains	
العاشر	5		Gears - Fundamental of gear principle	
الحادي عشر	5		Involute gears	
الثاني عشر	5		- Epicyclic gear train	
الثالث عشر	5		- Epicyclic gear train - Sun gears	
الرابع عشر	5		Balancing of rotating masses	
الخامس عشر	5		- cams	

12.البنية التحتية	
1- الكتب المقررة المطلوبة	Theory of machines by Khurmi
2- المراجع الرئيسية (المصادر)	

ا- الكتب والمراجع التي يوصى بها (المجلات العلمية , التقارير ,....)	Theory of Machines and Mechanisms by John J. Uicker, Jr., Gordon R. Pennock, Joseph E. Shigley
ب - المراجع الالكترونية, مواقع الانترنيت .	

13.خطة تطوير المقرر الدراسي
اضافة ساعات للتدريب العملي ومشاهدة تطبيقات عملية على مفردات الدراسة

	Ministry of Higher Education and Scientific Research - Iraq University of Diyala College of Engineering Department of mechanical Engineering	

المحلق رقم 4

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Applied Mathematics 1		**Module Delivery**		
Module Type			**Theory** **Lecture** **Tutorial**		
Module Code	**E 211**				
ECTS Credits	**4**				
SWL (hr/sem)	**60**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	mechanical Engineering		**College**	Engineering	
Module Leader	Dr. Nazar Muneam Mahmood Aldabash		**e-mail**	Nazar.aldabash@uodiyala.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**		

	Ministry of Higher Education and Scientific Research - Iraq University of Diyala College of Engineering Department of mechanical Engineering	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This module aims to provide students with an understanding of, and competence in the use of, mathematical techniques that are relevant to the solution of engineering problems. It will also give students a firm foundation from which to develop solutions to a wider and deeper range of engineering problems that they will encounter throughout their undergraduate engineering program of study.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Ability to apply knowledge of mathematics and engineering. 2. Ability to analyze and interpret data. 3. Ability to identify, formulate and solve engineering problems 4. The broad education needed to understand the impact of engineering solutions 5. Ability to use modern engineering techniques, skills, and tools necessary for engineering practice. 6. Learn about the concepts of Three dimensional space , rectangular coordinates in space, vectors, dot product, projections, cross product, parametric equations of the line, planes in triangular space, introduction to vector-valued functions. 7. Understand how to calculate calculus for vector value functions, changing parameters, arc length, unit tangent, normal and binary vectors, curvature, quadratic surfaces. Functions of two or more variables, limits and continuity. Partial derivatives, differential, local linear. Chain rule, directional derivatives and gradients. Tangent planes and normal vectors, maxima and minima of functions of two variables. Lagrange multipliers, double integrals. 8. Ability to solve double integrals over non-rectangular regions, double integrals in polar coordinates, triple integrals, cylindrical and spherical coordinates, triple integrals in cylindrical and spherical coordinates

Indicative Contents المحتويات الإرشادية	The topics listed under the indicative content below are the underpinning areas of knowledge and understanding that will be obtained from successful completion of the module. The mathematical topics are illustrated in the context of relevant engineering scenarios. those topics can be listed below : Rectangular Coordinate systems in 3-space, Vectors, Dot product, projections, Cross product, Parametric equations of a line, Planes in 3-space, Introduction to vector-valued functions. Calculus of vector-valued functions, Change of parameters, Arc Length, Unit Tangent, Normal and Binormal vectors, Curvature, Quadric Surfaces. Functions of two or more variables, Limits and continuity. Partial derivatives, Differentiability, Local Linearity. The Chain rule, Directional derivatives and gradients. Tangent planes and normal vectors, Maxima and minima of functions of two variables. Lagrange multipliers, Double integrals. Double integrals over non rectangular regions, Double integrals in polar coordinates, Triple integrals, Cylindrical and spherical coordinates, Triple integrals in cylindrical and Spherical coordinates

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Begin In Mathematics II, then employ a range of teaching strategies to ensure first-year engineering students fully grasp the various mathematical concepts. Instructional methods include interactive lectures, where core mathematical principles are explained in detail, and practical problem-solving sessions to provide hands-on learning experiences. Collaborative group work encourages peer-to-peer learning and reinforces understanding through shared insights. Regular formative assessments will be conducted to monitor students' understanding of the material, and feedback will be promptly given to guide their learning process. Instructors will maintain office hours for personalized support, and online resources will be available to supplement classroom instruction. Emphasis will be placed on relating mathematical concepts to real-world engineering applications to make the learning experience more relevant and engaging. These strategies aim to develop students' critical thinking skills, enhance their problem-solving abilities, and prepare them for advanced engineering studies. In addition to that , it should organize the lecture notes to cover the theoretical concept of the subject by including visual diagrams and plots, charts, arrows and symbols. Furthermore , it should divide the class into groups to encourage teamwork.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا				
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل **In class lectures** **45** **In class tests** **6** **Tutorial** **30** **Final Exam** **3**	84	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعي	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل **Assignment** **20** **Preparation for tests** **30** **Homework** **22**	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**156**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	20% (20)	3,5, 10, 12, 14	LO #1, 2, 3, 4 ,5 and 7
	Assignments	6	10% (10)	4, 8, 12	LO # 1, 2, 3, 4, 5 and 6
	Home Work	6	10% (10)	2,5,7,9,11,13	LO # 1, 2, 3, 4, 5,6 and 7
	Midterm Exam	2 hr	10% (20)	7	LO # 1,4
Summative assessment	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Rectangular Coordinate systems in 3-space ,Vectors, Dot product, projections, Cross product
Week 2	Parametric equations of a line 3-space
Week 3	Parametric equations of a plane 3-space
Week 4	Distances for lines and planes
Week 5	**Arc Length, Unit Tangent, Normal and Binormal vectors, Curvature, Quadric Surfaces.**
Week 6	Functions of two or more variables, Limits and continuity.
Week 7	Partial derivatives, Differentiability, Local Linearity
Week 8	The Chain rule, Directional derivatives and gradients. Tangent planes and normal vectors
Week 9	Maxima and minima of functions of two variables. Lagrange multipliers
Week 10	Review and first mid exam
Week 11	Double integrals over non rectangular regions,
Week 12	Double integrals in polar coordinates
Week 13	Triple integrals, Cylindrical coordinates
Week 14	Triple integrals, spherical coordinates
Week 15	Review and second mid exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Texts	Available in the Library?
Required Texts	Thomas' Calculus Early Transcendentals Thirteenth Edition	yes
Recommended Texts		
Websites	https://rodrigopacios.github.io/mrpacios/download/Thomas_Calculus.pdf	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

	Ministry of Higher Education and Scientific Research - Iraq University of Diyala College of Engineering Department of mechanical Engineering	

المحلق رقم 4

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	ENGINEERING MECHANICS DYNAMICS			**Module Delivery**	
Module Type	**BASIC**			**Theory** **Lecture** **Tutorial**	
Module Code	**ME207**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	2		**Semester of Delivery**	2	
Administering Department	mechanical Engineering		**College**	Engineering	
Module Leader	Dr. Mohammed Ismael Hameed		**e-mail**	mohammedismael_eng@uodiyala.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**		

	Ministry of Higher Education and Scientific Research - Iraq University of Diyala College of Engineering Department of mechanical Engineering	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	This module Specification provides a concise summary of the main features of the module and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programmer specification.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. An ability to apply knowledge of mathematics, science, and engineering. b. An ability to design and conduct experiments, as well as to analyze and interpret data. c. An ability to design a system, component, or process to meet desired needs within realistic engineering constraints d. An ability to function on multidisciplinary teams e. An ability to identify, formulate, and solve engineering problems
Indicative Contents المحتويات الإرشادية	The topics listed under the indicative content below are the underpinning areas of knowledge and understanding that will be obtained from successful completion of the module. The mathematical topics are illustrated in the context of relevant engineering scenarios. •introduction to engineering mechanics dynamics and kinematic of a particle. •rectilinear motion description and theory in (rectangular, normal and tangential and polar coordinates system) •relative velocity, absolute and dependent motion. •kinetic of a particle (newton′s second law) . •work and energy.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم

Strategies	-plan and execute experimental investigations; -apply and describe a variety of experimental techniques; -identify, estimate, combine and quote experimental errors and uncertainties;

Student Work load (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل **In class lectures** **55** **In class tests** **5** **Tutorial** **15** **Final Exam** **3**	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعي	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل **Assignment** **20** **Preparation for tests** **30** **Homework** **22**	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	20% (20)	3,5, 10, 12, 14	LO #1, 2, 3, 4 ,5 and 7
	Assignments	6	10% (10)	4, 8, 12	LO # 1, 2, 3, 4, 5 and 6
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	Midterm Exam	2 hr	10% (20)	7	LO # 1,4

Summative assessment	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction: engineering dynamics, kinematic, kinetic and rectilinear motion.
Week 2	Rectilinear motion rectangular coordinate
Week 3	General Equations of motions , constant acceleration problems.
Week 4	Motion of projectiles
Week 5	Curvilinear motion normal and tangential coordinate.
Week 6	Tutorial
Week 7	Curvilinear motion polar coordinate.
Week 8	Absolute Dependent Motion Analysis of Two Particles
Week 9	Relative velocity
Week 10	Tutorial
Week 11	Kinetics of a Particle: Force and Acceleration rectangular coordinate
Week 12	Kinetics of a Particle: Force and Acceleration rectangular coordinate normal and tangential coordinate
Week 13	Work and energy
Week 14	Principal of work and energy
Week 15	Tutorial

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	

Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Texts	**Available in the Library?**
Required Texts	ENGINEERING MECHANICS DYNAMICS R. C. HIBBELER	yes
Recommended Texts	ENGINEERING MECHANICS DYNAMICS R. C. HIBBELER	Yes
Websites	https://www.youtube.com/watch?v=yNllWETrDF0 https://www.youtube.com/watch?v=7aMiZ3b0Ieg	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
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Module Information
معلومات المادة الدراسية

Module Title	**مكائن كهربائية**	**Module Delivery**	
Module Type	S	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **L Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ME 212		
ECTS Credits	**5**		
SWL (hr/sem)	**125**		
Module Level		**Semester of Delivery**	
Administering Department	قسم هندسة الميكانيك	**College**	College of Engineering
Module Leader	احمد محمد كاظم	**e-mail**	ahmmedmohammed_enge@uodiyala.edu.iq
Module Leader's Acad. Title	مدرس مساعد	**Module Leader's Qualification**	ماجستير
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	011/06/2024	**Version Number**	

يوفر وصف المقرر هذا إيجازاً مقتضياً ألهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنا االستفادة القصوى من فرص التعلم المتاحة. والبد من الربط بينها وبين وصف ً عما إذا كان قد حقق البرنامج.

1.المؤسسة التعليمية	جامعة بغداد
2.القسم الجامعي / المركز	الهندسة / قسم هندسة الميكانيك
3.اسم / رمز المقرر 1	المكائن الكهربائية
4.البرامج التي يدخل فيها	هندسة الميكانيك / الدراسات االولية
5.أشكال الحضور المتاحة	حضور تام
6.السنة / الفصل	2022-2023\الثاني
7.عدد الساعات الدراسية الكلي	60
8.تاريخ إعداد هذا الوصف	2024
9. اهداف المقرر	
الغرض من هذه المادة هو تقديم النظريات االساسية لمكائن التيار المستمر والمتناوب ومبادى المحوالت الكهربائية والتي يحتاجونها في التطبيقات العملية والتصميمة تشمل مادة المكائن الكهربائية محورين : الاول التعرف على الاجزاء الاساسية لمكائن التيار المستمر والمتناوب وانواعها ويتعلم ايضا الخصائص الكهربائية . اما المحور الثاني يشمل دراسة المحوالت الكهربائية.	
10. مخرجات التعلم وطرائق التعليم والتعلم والتقييم	

أ- المعرفة والفهم
1أ -دراسة االجزاء االساسية لمكائن التيار المستمر
2أ –دراسة أنواع مكائن التيار المستمر والمتناوب وتصنيفاتها وتطبيقاتها
3أ- تحليل المحوالت الكهربائية
4أ-شرح وتوضيح الخسائر في المحوالت الكهربائية

ب - المهارات الخاصة بالموضوع
ب1 – تحليل انواع الربط لملفات المكائن
ب2 -تقديم انواع المكائن للتيار المستمر
ب3-توضيح عمل المحركات للتيار المستمر ومعادالت القدرة
ب4 -تقديم وعرض المحوالت الكهربائية وانواعها مع تقديم الدائرة المكافئة
ب5 -دراسة كفاءة المحوالت والتنظيم
ب6 -دراسة سيطرة السرعة للمحركات الكهربائية

طرائق التعليم والتعلم

القاء المحاضرات والتمارين

طرائق التقييم

الامتحانات وواجبات وكويزات

ج- مهارات التفكير
ج1 -ان تكون لدى الطالب مهارات التفكير
ج2 -ان تكون لدى الطالب القدرة على النقاش والتحليل
ج3 -ان تكون لدى الطالب المقدرة على التطبيق العملي

طرائق التعليم والتعلم

القاء المحاضرات والمناقشات داخل غرفة الصف

طرائق التقييم

الامتحانات التي تنطوي على مهارات حل المشكالت ومهارات التفكير الناقد

د - المهارات العامة والمنقولة (المهارات االخرى المتعلقة بقابلية التوظيف والتطور الشخصي)
د1 -امكانية التصميم والتنفيذ في ما يخص المكائن الكهربائية
د2 -زيادة المقدرة على المناقشة وتشجيع العمل الجماعي على فريق عمل

11.بنية المقرر

الاسبوع	الساعات	اسم الوحدة	طريقة التعليم	طريقة التقييم
الاول	4	Introduction Electrical Machine, Principles and Construction of, of a dc generator, the E.M.F equation and types of dc generator	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
الثاني	4	Losses and efficiency of dc generator	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
الثالث	4	Dc generator characteristics, Voltage building in self-excited dc generator, Armature reaction and how to reduce it	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
الرابع	4	Introduction, Principles	محاضرات	امتحانات

	and Construction of, of a dc motor, The E.M.F equation and types of dc motor		معروضة بشكل Lectures Notes PDF power point Video	يومية +مسائل رياضية +امتحانات شهري
الخامس	Losses and efficiency of dc motor	4	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
السادس	Dc motor characteristics	4	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
السابع	Introduction, Principles and Construction of transforer, The E.M.F equation and types of transformer	4	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
الثامن	Open circuit test and short circuit test on transformer	4	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
التاسع	equivalent circuit of single phase transformer	4	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
العاشر	Losses and efficiency of transformer	4	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري

الحادي عشر	4	Introduction, Principles and Construction of induction motor, The E.M.F equation and types of induction motor	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
الثاني عشر	4	Starting torque of induction motor and Torque of Induction Motor under Running Condition	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
الثالث عشر	4	Losses and efficiency of induction motor	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
الرابع عشر	4	Introduction, types, and construction of alternator	محاضرات معروضة بشكل Lectures Notes PDF power point Video	امتحانات يومية +مسائل رياضية +امتحانات شهري
الخامس عشر	4	The E.M.F equation of a alternator		امتحانات يومية +مسائل رياضية +امتحانات شهري

12.البنية التحتية

القراءات المطلوبة : • النصوص ألساسية • كتب المقرر • أخرى	1-Electric Machines by Gross, C.A 2-Performance and design of alternating current machines by Say, M.G 3-AC machines-electromagnetic and design by Chalmers, B &Williamson A. 4. A. Draper, “Electrical Machines” , 2nd edition, Longman, 1979. 5.Stephen J. Chapman, “Electric Machinery Fundamentals”, 4th edition,Mc Graw Hill, 2005.
متطلبات خاصة) وتشمل على سبيل المثال ورش العمل والدوريات والبرمجيات والمواقع الالكترونية)	روابط من الانترنت لها عالقة بمادة الكتاب والسيمينارات يفضل ترتيب زايره الحد مصانع او ورش صيانة املكائن الكهرابئيه وكذلك زايره الحدى حمطات توليد الطاقه الكهرابئيه

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**الرياضيات المتقدمة**		**Module Delivery**		
Module Type	S		☒**Theory** ☒**Lecture** ☐**Lab** ☒**L Tutorial** ☐**Practical** ☐**Seminar**		
Module Code	ME201				
ECTS Credits	**4**				
SWL (hr/sem)	**60**				
Module Level			**Semester of Delivery**		
Administering Department	قسم هندسة الميكانيك		**College**	College of Engineering	
Module Leader	ايمان محمد نعمه		**e-mail**	imanmohammad_eng@uodiyala.edu.iq	
Module Leader's Acad. Title	مدرس		**Module Leader's Qualification**	ماجستير	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	011/05/2024		**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- تمكين الطلبة من الحصول على المعرفة و الفهم في مادة الرياضيات المتقدمة 2- افهام و تعليم الطلبة اسس الرياضيات الخاصة بعلم الهندسة الميكانيكية 3- التعرف على الطرق الصحيحة لحل المعادلات الرياضية وكيفية تطبيقها في المجالات الهندسة الميكانيكية 4- زيادة خبرة الطالب في التعرف على المشاكل في الهندسة الميكانيكية وتحليلها وحلها, .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1 - الأهداف المعرفية 1- التعرف على الطرق الصحيحة لحل المعادلات الرياضية 2- التعرف على المفاهيم الاساسية لطرق حل المعادلات التفاضلية من الرتبة الاولى وفصل المتغيرات والعوامل التكاملية ومناقشة برنولي وطرق حلها 3- تعلم المعادلات التفاضلية من الرتبة الثانية وطريقة اشتقاق المعادلة المميزة او المساعدة والصور المختلفة التي ياخذها الحل حسب جذور المعادلة. 4- تعلم اساسيات طريقتي اختزال الرتبة (البارامترات) لحل المعادلات غير المتجانسة 5 – التعرف على المتتاليات والمتسلسلات الانهائية ومناقشة تقارب او تباعد المتتاليات والمتسلسلات مع الاختبارات المستخدمة ما اذا كانت المتسلسلة متقاربة او متباعدة 6- - فهم التقارب المطلق ومتسلسلة القوى في سلسلة تيلور وماكلورين للدالة في متغير واحد ومتسلسلة ذات الحدين.
Indicative Contents المحتويات الإرشادية	. • يبين الطالب أهمية الرياضيات في الحياة. • أن يستمتع الطالب من دراسة الرياضيات و أن يتحمس الطالب لحل الواجب. • اكتساب قيم إيجابية من مثل: (الدقة، التنظيم، المثابرة، والموضوعية في الحكم على المواقف، واحترام الرأي الآخر، وحسن استغلال الوقت) • تنمية تقدير الذات للكفاءة الرياضية. ○ تنمية الثقة بالرياضيات كوسيلة وغاية. ▪ تكوين ميول واتجاهات إيجابية نحو دراسة الرياضيات. • أن يحرص الطالب على الحضور والتواجد في محاضرة الرياضيات. **القدرة على التحليل و الاستنباط للوصول إلى أفضل و أدق النتائج.** القدرة على توظيف المعارف المجردة كالتحليل الرياضي إلى واقع تطبيقي. ربط المعارف الرياضية في الاختصاصات العلمية المختلفة. - تعزيز الثقة بالقدرات الذهنية الذاتية لمعالجة القضايا العلمية المعقدة.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	❖ استخدام الوسائل الحديثة في عرض الجانب العلمي و النظري مثل اجهزة Data Show لجذب النظر وشد الطلبة بشكل شيق عن طريق عرض بعض الافلام ذات العلاقة بالموضوع لتصل الفكرة بشكل افضل الى الطالب. ❖ اعطاء الطلبة واجبات لاصفية تتطلب منهم بذل مهارات و تفسيرات ذاتية بطرق اختبارية. ❖ الاستجواب للطبة من خلال الحلقات النقاشية عن طريق طرح الاسئلة التفكيرية (كيف ، لماذا ، متى ، اين ، اي) لمواضيع محددة.

	❖ استخدام اسلوب عصف الذهن و التغذية الراجعة من اجل تفعيل الخبرات المتراكمة لدى الطلبة من خلال ربط ما تم اخذه من مواد دراسية في المراحل الدراسية السابقة وربطها بالجديدة. اكساب الطلبة المهارات العملية من خل اجراء التجارب العملية على الاجهزة المختبرية

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	50	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	10	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	60		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	6	5%	5 and 10	LO #1, #2 and #10, #11
	Assignments	6	5%	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report				
Summative assessment	**Midterm Exam**	2hr	30%	7	LO #1 - #7
	Final Exam	3hr	60%	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Differential equations: - linear differential equations 1- first order linear equation: a-Separable equations

Week 2	Differential equations: - linear differential equations - b- Homogeneous equations c-Exact equations
Week 3	d-Linear equations e- Bernoulli's equations
Week 4	Exam
Week 6	linear differential equations: 2-Second order linear equation: a-reducible to first order linear equation
Week 7	b- Second order homogenous linear c- Second order non -homogenous linear
Week 8	Higher order differential equations: a- homogenous
Week 9	Higher order differential equations: b-non homogenous
Week 10	Sequences &series :infinite sequences, increasing and decreasing of the sequences ,geometric series
Week 11	Convergence &divergence test of infinite series 1-divergency test 2-ratio test
Week 12	3 -integral test 4-the nth-root test 5- comparison test.
Week 13	Alternating series ,absolute & conditional convergency of alternating
Week 14	Binomial series, the radius & interval of convergancy for power series, multiplication for power series
Week 15	Exam
Week 16	الامتحان النهائي

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	.Advanced Engineering Mathematics Calculus	نعم

Recommended Texts	Advanced Engineering Mathematics. Calculus 14	نعم
Websites		

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**مقاومة المواد**		**Module Delivery**		
Module Type	S		☒Theory ☒Lecture ☐Lab ☒L Tutorial ☐Practical ☐Seminar		
Module Code	ME106				
ECTS Credits	**4**				
SWL (hr/sem)	**60**				
Module Level			**Semester of Delivery**		
Administering Department	قسم هندسة الميكانيك		**College**	College of Engineering	
Module Leader	ايمان محمد نعمه		**e-mail**	imanmohammad_eng@uodiyala.edu.iq	
Module Leader's Acad. Title	مدرس		**Module Leader's Qualification**	ماجستير	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	011/05/2024		**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	يهدف المقرر الى تزويد طلبة المرحلة الثانية بالمعارف الأساسية لعلم مقاومة المواد. حيث يتم دراسة كل ما يتعلق بخواص المادة من خلال دراسة مفاهيم الإجهاد والانفعال وقانون هووك. يهدف المقرر الى تمكين الطلبة من الولوج إلى خواص المواد وإمكانية استخدامها في التطبيقات المناسبة لها من خلال معرفة قدرتها على تحمل الإجهادات الميكانيكية والحرارية المسلطة وسلوك المادة تحت االنفعال وتمثيل ذلك بيانيا ومن خلال المعادلات أيضا وفي ألخر تمكين الطالب الختيار المادة المناسبة لتطبيق المناسب
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- التعرف على مفهوم العلاقة بين الاجهاد والانفعال 2- القابلية على تعلم حل المعادلات الاستياك في مقاومة المواد 3- تعلم كيفية تحليل و تصميم المحور الدائري المتعرض الى الالتواء 4- القابلية على تحليل الاجهادات التي تتعرض لهل العتبة تحت تأثير الاحمال المركزية 5- التعرف على ايجاد اجهاد القص في العتبات تحت تأثير الاحمال المستعرضة ,
Indicative Contents المحتويات الإرشادية	. • يبين الطالب أهمية دراسة مادة مقاومة المواد في الحياة العملية لمهندس الميكانيك • أن يستمتع الطالب من دراسة مقاومة المواد و أن يتحمس الطالب لحل الواجب . ▪ تكوين ميول واتجاهات إيجابية نحو دراسة مقاومة المواد • أن يحرص الطالب على الحضور والتواجد في محاضرة مقاومة المواد **القدرة على التحليل و الاستنباط للوصول إلى أفضل و أدق النتائج.** القدرة على توظيف المعارف المجردة كالتحليل الرياضي إلى واقع تطبيقي. ربط المعارف تحلبل الاجهادات في الاختصاصات العلمية المختلفة. - تعزيز الثقة بالقدرات الذهنية الذاتية لمعالجة القضايا العلمية المعقدة.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	❖ اعطاء الطلبة واجبات لا صفية تتطلب منهم بذل مهارات و تفسيرات ذاتية بطرق اختبارية. ❖ الاستجواب للطبة من خلال الحلقات النقاشية عن طريق طرح الاسئلة التفكيرية (كيف ، لماذا ، متى ، اين ، اي) لمواضيع محددة. ❖ استخدام اسلوب عصف الذهن و التغذية الراجعة من اجل تفعيل الخبرات المتراكمة لدى الطلبة من خلال ربط ما تم اخذه من مواد دراسية في المراحل الدراسية السابقة وربطها بالجديدة. اكساب الطلبة المهارات العملية من خل اجراء التجارب العملية على الاجهزة المختبرية لجذب النظر وشد الطلبة Data Show استخدام الوسائل الحديثة في عرض الجانب العلمي و النظري مثل اجهزة بشكل شيق عن طريق عرض بعض الافلام ذات العلاقة بالموضوع لتصل الفكرة بشكل افضل الى الطالب

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	50	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	10	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	60		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	6	5%	5 and 10	LO #1, #2 and #10, #11
	Assignments	6	5%	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report				
Summative assessment	**Midterm Exam**	2hr	30%	7	LO #1 - #7
	Final Exam	3hr	60%	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of strength of materials Simple Stress and Strain
Week 2	Simple Stress and Strain
Week 3	behavior of brittle and ductile material Mechanical Properties
Week 4	. Axial Load 1-Elastic Deformation of an Axially Loaded Member
Week 5	. Axial Load 2-Statically undetermined axially loaded member

Week 6	Thermal stress
Week 7	Shear stress The torque Absolute maximum torque and cross section area
Week 8	Statically undetermined torque loaded member
Week 9	Shear force and bending moment
Week 10	Shear force and bending moment
Week 11	Moment of inertia of the section
Week 12	Centroid of the center area stress
Week 13	Transverse Shear
Week 14	Principle stress Mohr's stress
Week 15	**EXAM**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	.Advanced Engineering Mathematics Calculus	نعم
Recommended Texts	Advanced Engineering Mathematics. Calculus 14	نعم
Websites		

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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Ministry of Higher Education and Scientific Research - Iraq
University of Diyala
College of Engineering
Department of mechanical Engineering

المحلق رقم 4

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Applied Computer Programming**			**Module Delivery**	
Module Type	**S (**Support or related learning activity**)**			**Theoretical Lectures and Tutorials**	
Module Code	**ME 206**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	2		**Semester of Delivery**	1	
Administering Department	Mechanical Engineering		**College**	Engineering	
Module Leader	Asst Prof. Dr. Ali Khudhair Al-Jiboory		**e-mail**	alikhudhair_eng@uodiyala.edu.iq	
Module Leader's Acad. Title	Asst. Prof. Dr.		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Equip students with a strong foundation in MATLAB syntax and programming concepts. 2. Enable students to write, debug, and optimize MATLAB scripts and functions effectively. 3. Emphasize the application of MATLAB in simulations, data analysis, and modeling relevant to mechanical engineering. 4. Develop students' ability to analyze and visualize data using MATLAB.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students will be proficient in using MATLAB for programming, data analysis, and visualization. They will be capable of writing, debugging, and optimizing MATLAB scripts and functions, and applying these skills to solve complex engineering problems. Students will have developed the ability to analyze and visualize data, create simulations, and model engineering systems, particularly in the context of mechanical engineering. This course will also prepare students for advanced engineering courses and projects, fostering critical thinking and problem-solving skills essential for their academic and professional growth.
Indicative Contents المحتويات الإرشادية	1. The topics listed under the indicative content below are the underpinning areas of knowledge and understanding that will be obtained from successful completion of the module. The mathematical topics are illustrated in the context of relevant engineering scenarios. 2. Study the basic principles of using computer-aided engineering and its applications in practical life.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- Lectures and Demonstrations. - Lab Exercises and Interactive Tutorials. - Weekly Assignments and Capstone Project.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل **In class lectures** **In class tests** **Final Exam**		**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعي	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل **Assignment** **Preparation for tests** **Homework**		**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل			

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	Quizzes	1hr/4	10% (10)	3,5, 10, 12, 14	LO #1, 2, 3, 4 ,5 and 7
	First Exam	2hr/1	15% (15)	4, 8, 12	LO # 1, 2, 3, 4, 5 and 6
	Second Exam	2hr/1	15% (15)	5,7,9,11,13	LO # 1, 2, 3, 4, 5,6 and 7
	Lab Exam	2 hr /1	10% (10)	7	LO # 1,4
Summative assessment	Final Exam	3 hr /1	50% (50)	15	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to MATLAB Environment
Week 2	Variables and Data Types
Week 3	Vectors and Matrices
Week 4	Logical Operations
Week 5	Program Control Structure (For loop)
Week 6	Program Control Structure (while loop)
Week 7	1st Exam
Week 8	Nested loops
Week 9	User-defined Functions
Week 10	Plotting and Visualization - Part I
Week 11	Plotting and Visualization - Part II
Week 12	Data Import and Export
Week 13	Project Work and Integration
Week 14	2nd Exam
Week 15	Course Review and Final Project Presentations

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Texts	Available in the Library?
Required Texts	Brian D. Hahn and Daniel T. Valentine. *Essential MATLAB for engineers and scientists*. 7th Edition, Academic Press, 2019.	No
Recommended Texts	William J. Palm III. *MATLAB® for Engineering Applications*. McGraw Hill, 2023.	No
Websites	https://www.mathworks.com/	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
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Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
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