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

Academic Program and Course Description Guide

2025

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 extracurricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: Basrah university

Faculty/Institute: Engineering college

Scientific Department: Mechanical engineering

Academic or Professional Program Name: The curricula of the Mechanical Engineering Department

Final Certificate Name: Bchelor of Mechanical Engineering

Academic System: Daily Attendance & Bologna system

Description Preparation Date: 2025

File Completion Date:2025

Signature:

Head of Department Name:

Assist. Prof. Dr. Raad Jamal Jassim

Date: 1/9/2026

Signature: M.A. Ismael

Scientific Associate Name:

Prof. Dr. Muneer A. Ismael

Date: 1/9/2026

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Assist. Prof. Dr Ali K. Marzook

Date: 1/9/2026

Signature:

Approval of the Dean

Prof. Dr. Mofeed Turky Rashid

1. Program Vision

The vision of the Mechanical Engineering Department is to graduate engineers specialized in mechanical engineering in accordance with the latest internationally accredited curricula, with the aim of implementing various engineering projects currently required by the country. The department seeks to provide a high-quality engineering, educational, and research environment in the field of mechanical engineering to serve and build the nation, while highlighting the vital role of mechanical engineers in cultural development and scientific advancement.

2. Program Mission

The Department of Mechanical Engineering has adopted a rigorous academic program that combines theoretical lectures with a wide range of practical applications. Through continuous development of its laboratories, the department has ensured that the practical component complements the theoretical courses, enabling students to thoroughly understand and enhance their knowledge of engineering materials. The department is committed to a clear path in scientific research, focusing primarily on applied aspects aimed at serving development in Iraq.

3. Program Objectives

1. Preparing and qualifying specialized engineers to meet the requirements of the labor market in the private and public sectors in mechanical engineering through diversity in teaching and learning methods and training students to apply the acquired knowledge and skills to solve real problems.

2. Providing distinguished academic programs in the field of mechanical engineering, both theoretical and practical, to comply with international standards of academic quality and meet the needs of the labor market.

3. Encouraging and developing scientific research in the fields of mechanical engineering in general and in the fields of thermal mechanics, heat transfer and all areas of applied mechanics and control in particular on mechanical and hydraulic systems and robots in addition to the fields of manufacturing and metalworking.

4. Preparing a stimulating environment for faculty members to develop their knowledge and educational and research skills, such as courses, seminars, and workshops to prepare researchers with high scientific skills.

5. Building and developing partnerships with the governmental and private sectors and the community in all its various institutions and exchanging experiences.

4. Accreditation

ABET

5. Other external influences
Field and scientific visits

7. Program Description				
Level/Year	**Course or module code**	**Course or module title**	**Credit hours**	
			Theore.	**Prac.**
First year first semester	BEM111	Mathematics I	5	
	BEM112	Engineering Mechanics-Static	6	
	BEM113	Engineering Drawing I	5	
	BEM114	Applied Science	4	
	UOB103	Computer I	2	2
	UOB102	Human Rights and Democracy	2	
	UOB104	Arabic Language I	2	
First year second semester	BEM121	Mathematics II	5	
	BEM122	Engineering Mechanics-Dynamic	5	
	BEM123	Engineering Drawing II	4	
	BEM124	Electrical Engineering	3	3
	BEM125	Production Engineering	5	3
	UOB101	English Language	2	
Second year first semester	BEM211	Engineering Mathematics I	4	
	BEM212	Fluid Mechanics	6	3
	BEM213	Strength of Materials	6	3
	UOB203	Computer II	2	2
	UOB205	Crimes of Uprooted Baath Party	2	
	UOB204	Arabic Language II	2	
Second year second semester	BEM221	Engineering Mathematics II	4	
	BEM222	Thermodynamics	5	3
	BEM223	Engineering Metallurgy	4	3
	BEM224	Mechanical Drawing	4	

	BEM225	Electrical Machines	2	
	UOB201	English Language II	2	
Third year First Semester	E311	Engineering Analysis	4	-
	ME312	Heat Transfer I	3	-
	ME313	Theory of Mechanisms	3	3
	ME314	Internal Combustion Engines I	3	3
	ME315	Gas Dynamics	3	-
	ME316	Electrical Machines I	3	-
	ME317	Manufacturing Processes I	2	3
Third year Second Semester	E321	Numerical Analysis	3	2
	ME322	Heat Transfer II	3	3
	ME323	Theory of Machines	3	-
	ME324	Internal Combustion Engines II	3	-
	ME325	Turbo Machinery	3	3
	ME326	Electrical Machines II	3	2
	ME327	Manufacturing Processes II	2	-
Fourth year First Semester	ME411	Design of Machine Elements I	4	3
	ME412	Control	3	-
	ME413	Air Conditioning and Refrigeration I	3	3
	ME414	Engineering Materials	2	-
	ME415	Theory of Vibrations	3	-
	ME416	Power Plants I	3	-
	ME417	Industrial Engineering	2	-
	E418	Engineering Project	2	3
Fourth year Second Semester	ME421	Design of Machine Elements II	3	-
	ME422	Measurements	3	3
	ME423	Air Conditioning and Refrigeration II	3	-
	ME424	Failure of Engineering Materials	2	-
	ME425	Vibrations Applications	3	3

	ME426	Power Plants II	3	3
	ME427	Project Management	2	-
	E418	Engineering Project (continued)	-	3

8. Expected learning outcomes of the program

A. Knowledge and Understanding

A1. Clarify the basic concepts of mechanical systems and their applications in engineering and industrial fields.

A2. Acquiring knowledge in designing mechanical parts and trying to apply them in practice and solving industrial problems.

A3. Identifying mechanical parts and metal testing methods and their suitability for engineering uses.

A4. Studying mechanical systems and identifying how to conduct designs calculations according to standard specifications.

B. Subject-specific skills

B1. Designing simple and complex mechanical systems through the computer and performing design calculations.

B2. Gaining experience in manufacturing mechanical parts and testing their suitability for engineering uses.

B3. Gaining experience in writing scientific and engineering reports and how to read designs and engineering drawings.

B4. Keeping abreast of development and modernity in metal manufacturing processes and using modern mechanical designs.

C. Thinking Skills

C1. Interest: Arousing students' attention through questions during the lecture.

C2. Response: Follow up on the student's interaction with the material displayed on the screen.

C3. Attention: Follow up on the interest of the student who interacted the most with the presented material.

C4. Forming the direction: meaning that the student is sympathetic to the presentation and may have an opinion about the direction of the presented topic and defend it.

C5. Formation of value behavior: meaning that the student reaches the top of the emotional ladder so that he has a stable level in the lesson and does not become lazy or fidgety.

D. General and Transferable Skills (other skills relevant to employability and personal development)

D1. Develop the student's ability to deal with technical means.
D2. Develop the student's ability to deal with the Internet.
D3. Develop the student's ability to deal with multiple media.

D4. Develop the student's ability to dialogue and discussion.

9. Teaching and Learning Strategies

1. Explanation and clarification through lectures and increasing understanding through laboratories.
2. The method of displaying scientific materials on display devices, data shows, smart boards, plasma screens for tablets.
3. Self-learning by homework.
4. The weekly discussion of the subject and the solution of some additional questions for the subject.

10. Evaluation methods

1. Short exams (Quiz).
2. Homework.
3. Semester and final exams for theoretical subjects.
4. Interaction within the lecture and student attendance.

Assessment methods

1. Effective participation in the classroom is evidence of the student's commitment and responsibility.
2. Commitment to the deadline specified in submitting the duties and research required of the student to submit them.
3. The quarterly and final exams express commitment and cognitive and skill achievement.

11. Faculty										
	Faculty Member	Highest Degree Earned, Field and Year.	Scientific Rank	Type of Academic Appointment [2] PS or TS[2]	Experience			Level of activity H ,M ,L		
					Total Faculty	This Institution	Work & Other	Professional organization	Professional Development	Consulting work in industry
1	Ameen Ahmed Nassar	Ph.D., Cranfield University, UK, Applied, Mechanics 1999.	P	PS	32	32	2	H	H	H
2	Abdul Kareem Flaih Hassan	Ph.D., University of Basrah, Applied Mechanics,	P	PS	42	42	5	H	H	H
3	Salman Hasham Hamady	Ph.D., University of Basrah, Heat Transfer, 2007.	P	PS	30	30	2	H	H	H
4	Muneer Abdul Jaleel Ismael	Ph.D., University of Basrah, Heat Transfer, 2007.	P	PS	22	22	2	H	H	H
5	Falah Ahsy Abood	Ph.D., University of Basrah, Heat Transfer, 2007.	ASP	PS	30	30	2	H	H	H
6	Nathera Abdelhassan Salah	Ph.D., University of Basrah, Applied Mechanics, 2007.	ASP	PS	31	31	1	H	H	H
7	Hussein Sadeq Sultan	Ph.D., University of Basrah, Heat Transfer, 2011.	ASP	PS	22	22	3	H	H	H
8	Rafil Mahmood Laftah	Ph.D., University of Basrah, Applied Mechanics, 2007.	ASP	PS	22	22	2	H	H	H
9	Qusai Talib Abdel Wahab	Ph.D., University of Basrah, Applied Mechanics, 2004.	ASP	PS	22	22	1	H	H	H

10	Jafer Kalef Ali	Ph.D., University of Basrah, Applied Mechanics, 2012.	P	PS	21	21	1	H	H	H
11	Khaled Baker Saleem	Ph.D., University of Basrah, Heat Transfer, 2009.	ASP	PS	22	22	2	H	H	H
12	Haider Khazal Mihbas	Ph.D., University of Basrah, Applied Mechanics, 2013.	ASP	PS	18	18	1	H	H	H
13	Hassanein Ibraheem Khalaf	Ph.D., University of Basrah, Applied Mechanics, 2015.	ASP	PS	21	19	2	H	H	H
14	Murtadha Abbas Jabber	Ph.D., University of Basrah, metallurgical engineering, 2010.	ASP	PS	22	22	3	H	H	H
15	Raheem Khazal Musawel	Ph.D., University of Basrah, Applied Mechanics, 2014.	ASP	PS	22	22	2	H	H	H
16	Abdulbaseer Shari Bahedh	Ph.D., University of Basrah, Applied Mechanics, 2016.	ASP	PS	17	17	3	H	H	H
17	Mohammed Khairullah Kadhim	Ph.D.,Cardiff University, UK, Heat Transfer, 2017.	ASP	PS	18	18	3	H	H	H
18	Haider Mahdy Laeth	Ph.D., University of Basrah, Applied Mechanics, 2013.	ASP	PS	18	18	3	H	H	H
19	Imad Abdul-Kadhem Kheioon	Ph.D., University of Basrah, Applied Mechanics, 2013.	ASP	PS	24	24	3	H	H	H
20	Ali Habel Zaibel	Ph.D., University of Basrah, Applied Mechanics, 2000.	L	PS	21	21	1	H	H	H
21	Emad Abdullah Khazal	Ph.D., University of Basrah, Fluid Mechanics, 2011.	L	PS	22	22	2	H	H	H
22	Raad Jamal Jassim	Ph.D., University of Basrah, Applied Mechanics, 2013.	ASP	PS	21	21	3	H	H	H
23	Ali Hasan Abedaali	Ph.D., University of Basrah, Applied Mechanics, 2013.	L	PS	22	22	1	H	H	H
24	Basil Shenain Munahi	Ph.D., University of Basrah, Applied	L	PS	21	21	1	H	H	H

		Mechanics, 2014.								
25	Mahmood Shaker Jamel	Ph.D., University Tenaga Nasional, Malaysia, Heat Transfer, 2014.	L	PS	22	22	3	H	H	H
26	Usama Jasim Naeem	Ph.D., Huazhong University, China, Applied Mechanics, 2013.	L	PS	19	19	2	H	H	H
27	Alaa Hlejy Mohammed	Ph.D., University of Basrah, Heat Transfer, 2016.	L	PS	16	16	5	H	H	H
28	Asma Aassy Kawy	Ph.D., University of Basrah, Applied Mechanics, 2016.	L	PS	22	22	1	H	H	H
29	Sana Mahdy Shrama	Ph.D., University of Basrah, Heat Transfer, 2016.	L	PS	22	22	1	H	H	H
30	Ali Kadem Hady	Ph.D., Lund University, Sweden, Heat Transfer, 2016.	L	PS	21	21	2	H	H	H
31	Ahmad Abdulkareem Mahdi	Ph.D., Salford University, UK, Heat Transfer, 2017.	L	PS	16	16	2	H	H	H
32	Sana Jaafar Yaseen	Ph.D., University of Basrah, Heat Transfer, 2018.	L	PS	20	20	2	H	H	H
33	Rafed Jabbar Mohammed	Ph.D., University of Basrah, Applied Mechanics, 2020.	L	PS	21	21	2	H	H	H
34	Qahtan Adnan Jawad	Ph.D., University of Basrah, Applied Mechanics, 2020.	L	PS	12	12	2	H	H	H
35	Mohammed Baker Mehsen	Ph.D., Cardiff University, UK, Heat Transfer, 2017.	L	PS	18	18	2	H	H	H
36	Yahya Mohammed Ameen	Ph.D., University of Basrah, Applied Mechanics, 2021.	L	PS	25	12	4	H	H	H
37	Ehsan Nadehm Jawad	Ph.D., University of Basrah, Heat Transfer, 2022.	L	PS	14	14	1	H	H	H

38	Hasanain Sami Abdulhadi	Ph.D., Wright State University, USA, Applied Mechanics, 2020.	L	PS	16	16	2	H	H	H
39	Rana Lateef Netoosh Dawood	MSc, University of Basrah, Heat Transfer, 2002.	L	PS	22	22	1	H	H	H
40	Zainab Kareem Rady	MSc, University of Basrah, Heat Transfer, 2002.	L	PS	22	22	2	H	H	H
41	Huda Abedallha Abedalkreem	MSc, University of Basrah, Heat Transfer, 2010.	L	PS	14	14	1	H	H	H
42	Feras Moter Khlaf	MSc, University of Basrah, Heat Transfer, 2010.	ASL	PS	14	14	2	H	H	H
43	Safaa Hafedh Hayder,	MSc, 2020. Southern Technical University, Fuel and Energy.	ASL	PS	7	7	1	H	H	H
44	Nagham Muhammed Abdul-Kareem	MSc, University of Basrah, 2018.	ASL	TS	4	4	1	H	H	H

(1) Code: P = Professor, ASP = Assistant Professor, L = Lecturer, ASL = Assistant Lecturer and O = Other.
(2) Code: PS = Permanent Staff, TS = Temporary Staff.

Professional Development

Mentoring new faculty members

The department places great emphasis on guiding new faculty members by familiarizing them with its mission and educational objectives, and by providing them with the necessary orientation on effective teaching strategies, modern assessment methods, and the integration of technology into the teaching and learning process.

In addition, orientation sessions and training workshops are organized to support new faculty members in adapting to the academic environment and to clarify their teaching, research, and administrative responsibilities. These initiatives also strengthen communication between new faculty members and their more experienced colleagues through mentoring and professional guidance programs.

Thus, the department's efforts go beyond merely supporting new faculty at the beginning of their academic careers. They aim to build a strong base of qualified teaching staff capable of developing curricula, improving teaching methodologies, and making effective contributions to both research and community service.

Professional development of faculty members

Professional development for faculty members is considered one of the fundamental pillars upon which the department relies to achieve its academic and research objectives. This is accomplished through a variety of activities and programs, such as:

1. Training workshops on modern teaching methods and active learning techniques.
2. Developmental courses in the use of e-learning tools and digital technologies to support the educational process.
3. Mentoring and academic supervision programs to exchange experiences between new faculty members and senior academic staff.
4. Encouraging scientific research and publication in reputable journals through supporting both individual and collaborative research projects.
5. Participation in conferences and scientific seminars at the local and international levels to promote knowledge exchange and professional networking.

12. Acceptance Criterion

1. Rate: greater than 90 %.

2. Age: less than 25 years old.

3. Number: about 70 students annually.

13. The most important sources of information about the program

1. The websites of Iraqi and foreign universities.

2. The workshops are held by the Ministry of Higher Education in addition to the Ministry's standards.

3. The Accreditation Board for Engineering and Technology program (ABET).

14. Program Development Plan

The Department of Mechanical Engineering seeks to continuously improve its academic program through:

- Updating the curriculum to include emerging topics such as renewable energy and artificial intelligence.
- Enhancing teaching and assessment methods by integrating e-learning and providing continuous training for faculty members.
- Supporting scientific research and strengthening collaboration with industry.
- Upgrading infrastructure and laboratory facilities.
- Expanding student and community services through surveys, training workshops, and partnerships with institutions

Curriculum Skills Map																			
please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed																			
Programme Learning Outcomes																			
Year / Level	Course Code	Course Title	Core Title or Option	Knowledge and understanding				Subject-specific skills				Thinking Skills				General and Transferable Skills (or) Other skills relevant to employability and personal development			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
First year first semester	BEM111	Mathematics I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM112	Engineering Mechanics-Static	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM113	Engineering Drawing I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM114	Applied Science	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB103	Computer I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB102	Human Rights and Democracy	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB104	Arabic Language I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
First year second semester	BEM121	Mathematics II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM122	Engineering Mechanics-Dynamic	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM123	Engineering Drawing II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM124	Electrical Engineering	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM125	Production Engineering	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB101	English Language	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second year first semester	BEM211	Engineering Mathematics I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM212	Fluid Mechanics	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM213	Strength of Materials	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

	UOB203	Computer II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB205	Crimes of Uprooted Baath Party	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB204	Arabic Language II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Second year second semester	BEM221	Engineering Mathematics II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM222	Thermodynamics	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM223	Engineering Metallurgy	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM224	Mechanical Drawing	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	BEM225	Electrical Machines	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	UOB201	English Language II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Third year First Semester	E311	Engineering Analysis	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME312	Heat Transfer I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME313	Theory of Mechanisms	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME314	Internal Combustion Engines I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME315	Gas Dynamics	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME316	Electrical Machines I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME317	Manufacturing Processes I	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Third year Second Semester	E321	Numerical Analysis	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME322	Heat Transfer II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME323	Theory of Machines	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME324	Internal Combustion Engines II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME325	Turbo Machinery	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ME326	Electrical Machines II	Essential	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Mathematics I**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM111**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Mohammed Bakir Mohsen		**e-mail**	mohammed.mohsen@uobasrah.edu.iq	
Module Leader's Acad. Title		Lecture	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	This course provides a fundamental study of calculus and is intended for engineering students. It is intended to provide an understanding of fundamental concepts, and lay the foundation for more advanced courses in calculus and mathematics in general. Topics covered include a brief overview of functions, followed by a discussion of limits, derivatives, and practical applications of differential calculus in real-world problem solving contexts. The course ends with an introduction to integration supplemented by a brief overview of transcendental functions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Illustration of the calculus principle. 2. Mastery of differentiation techniques. 3. Improving the ability to apply derivative to analyze and solve engineering problems. 4. Providing proficient integration skills for solving problems related to accumulation. 5. Understanding fundamental theorems of calculus and their implications in solving engineering problems, including the interpretation of definite integrals and antiderivatives. 6. Learning the basicl skills for analyzing and modeling industrial problems. 7. Developing the ability to interpret the results of solving real-world problems. 8. Writing scientific reports.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- The Cartesian Plane and Functions : The distance formula, lines, The slope and the equation of a line, Parallel and perpendicular lines, circles domain and range, Functions and their graphs, The Trigonometric Functions and Graphs of Trigonometric Functions, Graphs of Trigonometric Functions . [6 hrs] 2- The Limits and Continuity ; Calculating Limits Using the Limit Laws, Properties of Limits, Limits of Trigonometric Function, Special Trigonometric Limits, L-Hopital's Rule, Continuity, Properties of Continuous Function. [6 hrs] 3- Differentiation : Definition of the Derivative, Differentiation Rules Definition of the Derivative, Differentiation Rules, Derivatives of Trigonometric Functions, The Chain Rule, Implicit Differentiation, Related Rates. [10 hrs] 4- Applications of Differentiation : The First Derivative Test, Concavity and the Second Derivative Test, The First Derivative Test, Concavity and the Second Derivative Test, Curve Sketching, Optimization Problems, The mean value Theorem. [6 hrs] 5- Integration : The Definite Integral, Basic Integration Rules, Integration of Trigonometric Functions, The Area under the Curve, The Natural Logarithmic Function, The Derivative and Integration of Natural Logarithmic Function, First Law of Calculus, and The mean value Theorem for Integral, First Law of Calculus, and The mean value Theorem for Integral. [12 hrs] 6- Inverse Functions : Exponential Functions, Rules and Properties of the Exponential Functions, The Derivative and Integration of Exponential Function, Exponential Functions, Rules and Properties of the Exponential Functions, The Derivative and Integration of Exponential Function, The Exponential Function for Bases other Than (e) (a^x and $\log_a{}^x$), Derivative and Integration the Exponential Function for Bases other Than (e)products. Equations of lines and planes in the space, Inverse Trigonometric Functions, Derivative and Integration of Trigonometric Functions, and Hyperbolic Function. [14 hrs].

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Reading and self-learning. • Training and activities during lecture. • Homework. • Suggesting websites for extra reading. • Discussions and case studies.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	10% (10)	4, 8, 11, 14	LO # 2, 3, 4, 5, 6, and 7
	Assignments	2	10% (10)	7 , 12	LO # 2, 3, 4, 5, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 6, 7 and 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	The distance formula, lines, The slope and the equation of a line, Parallel and perpendicular lines, circles domain and range
Week 2	Functions and their graphs, The Trigonometric Functions and Graphs of Trigonometric Functions.
Week 3	Graphs of Trigonometric Functions. Calculating Limits Using the Limit Laws, Properties of Limits,
Week 4	Limits of Trigonometric Function, Special Trigonometric Limits
Week 5	L-Hopital's Rule, Continuity, Properties of Continuous Function. Definition of the Derivative, Differentiation Rules Definition of the Derivative, Differentiation Rules
Week 6	Derivatives of Trigonometric Functions, The Chain Rule.
Week 7	Implicit Differentiation, Related Rates.
Week 8	The First Derivative Test, Concavity and the Second Derivative Test, The First Derivative Test, Concavity and the Second Derivative Test, Curve Sketching,
Week 9	Optimization Problems, The mean value Theorem. The Definite Integral, Basic Integration Rules,
Week 10	Integration of Trigonometric Functions, The Area under the Curve
Week 11	The Natural Logarithmic Function, The Derivative and Integration of Natural Logarithmic Function, First Law of Calculus, and The mean value Theorem for Integral.
Week 12	First Law of Calculus, and The mean value Theorem for Integral. Exponential Functions, Rules and Properties of the Exponential Functions, The Derivative and Integration of Exponential Function
Week 13	Exponential Functions, Rules and Properties of the Exponential Functions, The Derivative and Integration of Exponential Function
Week 14	The Exponential Function for Bases other Than (e) (a^x and $\log_a{}^x$), Derivative and Integration the Exponential Function for Bases other Than (e)products. Equations of lines and planes in the space.
Week 15	Inverse Trigonometric Functions, Derivative and Integration of Trigonometric Functions, and Hyperbolic Function

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thomas' Calculus I Maurice D. Weir, Joel Hass, George B. Thomas.-12th ed.	Yes
Recommended Texts	Advanced Engineering Mathematics, By Erwin Kreyszig, 1999, John Wiley & Sons, Inc	Yes
Websites	Khan Academy, Paul's Online Math Notes.	

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	**Engineering Mechanics-Statics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM112**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		1	**Semester of Delivery**		1
Administering Department		MECHANICAL	**College**	Engineering College	
Module Leader	Dr. Raad Jamal Jassim		**e-mail**	Raad.jassim@uobasrah.edu.iq	
Module Leader's Acad. Title		lecture	**Module Leader's Qualification**		Ph.D.
Module Tutor	Raheem Khazal Al-Sabur		**e-mail**	raheem.musawel@uobasrah.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		01/10/2024	**Version Number**		2.0

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 Aims أهداف المادة الدراسية	1. Develop a solid understanding of the fundamental principles of static equilibrium. 2. Introduce and apply the conditions for static equilibrium in two and three dimensions. 3. Investigate the effects of forces on structures and mechanical components. 4. Apply moment analysis to solve engineering problems involving torque and rotational equilibrium. 5. Apply statics principles to assess the stability and internal forces in trusses, frames, and machines. 7. Calculate frictional forces and explore their impact on the design and analysis of mechanical systems. 8. Explore the concepts of the center of gravity and centroids for simple and composite bodies.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define and explain the fundamental principles of static equilibrium and Recognize and apply the conditions for static equilibrium in two and three dimensions. 2. Apply vector addition and subtraction to analyze force systems. 3. Calculate moments and couples about specified axes. 4. Create clear and accurate free-body diagrams for simple and complex structures. 5. Apply equations of equilibrium to analyze trusses, frames, and machines. 6. Analyze determinate and indeterminate structures using equilibrium principles. 7. Understand the principles of friction and its effects on static equilibrium.

	8. Apply concepts of center of gravity to analyze stability.
Indicative Contents المحتويات الإرشادية	1. Definition of statics and its importance in mechanical engineering. 2. Resultant and equilibrium of force systems. 3. Analysis of coplanar force systems. 4. Couples and their effects on rigid bodies. 5. Trusses and frames: analysis and member forces. 6. Equilibrium analysis in three dimensions. 7. Types of friction and their characteristics. 8. Definition and calculation of the center of gravity.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Learning Strategies Conduct interactive lectures using visual aids, examples, and demonstrations to explain theoretical concepts. Encourage student participation through questions and discussions. Allocate dedicated time for problem-solving sessions to reinforce theoretical concepts. Learning Strategies: Implement active learning techniques, such as think-pair-share, concept mapping, and peer teaching, to engage students in the learning process. Encourage students to ask questions and seek clarification. Practical Demonstrations: Use practical demonstrations, physical models, or interactive apps to illustrate statics principles. Connect theoretical concepts to tangible examples for better comprehension.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	58	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.86
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**	2	10% (10)	5, 10	LO #2, 3, 5, and 7
	Assignments	2	10% (10)	2, 12	LO # 4 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 4, 7 and 8
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-5
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Newton's Three Laws of Motion, Units of Measurement (General Principles)
Week 2	Vector Operations (Force Vectors)
Week 3	Vector Addition of Forces, Addition of a System of Coplanar Forces(Force Vectors)
Week 4	Condition for the Equilibrium of a Particle (Equilibrium of a Particle)
Week 5	The Free-Body Diagram, Coplanar Force Systems (Equilibrium of a Particle)
Week 6	Moment of a Force -Scalar Formulation (Force System Resultants)
Week 7	Principle of Moments, Moment of a Couple, Conditions for Rigid-Body Equilibrium (Force system Resultants)
Week 8	Free-Body Diagrams, Equations of Equilibrium (Equilibrium of a Rigid Body)
Week 9	Condition for the Equilibrium of a Particle (Equilibrium of a Particle)
Week 10	Characteristics of Dry Friction (Friction)
Week 11	Problems Involving Dry Friction (Friction)
Week 12	Center of Gravity, Center of Mass, and the Centroid of a Body (Center of Gravity and Centroid)

Week 13	Composite Bodies (Center of Gravity and Centroid)
Week 14	Definition of Moments of Inertia for Areas, Parallel-Axis Theorem for an Area (Moments of Inertia)
Week 15	Radius of Gyration of an Area, Moments of Inertia for Composite Areas (Moments of Inertia)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Vector Mechanics for Engineers, Static FOR Beer	Yes
Recommended Texts	Vector Mechanics for Engineers, Static for HLBBELER	No
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.

6MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Drawing I**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**BEM113**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Sana Mahdi Shrama		**e-mail**	sana.mahdi@uobasrah.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. Preparing and qualifying specialized engineers to meet the requirements of the labor market in the private and public sectors in mechanical engineering through diversifying the methods of learning and teaching and training students to apply the acquired knowledge and skills to solve real problems. 2. Providing distinguished academic programs in the field of mechanical engineering, both theoretical and practical, and international rules of academic quality that meet the needs of the labor market. 3. Encouraging and developing scientific research in the fields of mechanical engineering. 4. Preparing a stimulating environment for faculty members to develop their knowledge and educational and research skills
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. An understanding of the principles of engineering drawing and the importance of clear and accurate communication between engineers, designers, and manufacturers. 2.Use different types of drafting tools, such as drawing boards, pencils, compasses, and rulers. 3.Use appropriate line types and thicknesses for different elements in a drawing (e.g., object lines, hidden lines, centerlines) 4. Engineering operations refer to the various activities and tasks involved in the design, production, and maintenance of engineering systems, equipment, and processes. 5. Acquire the skills to draw different shapes (pentagram, hexagon, oval, etc) 6.Create multiview drawings and understand the importance of orthographic projection. 7.Understand and apply different types of views, such as plan views, elevation views, section views, and detail views, to accurately represent object features. 8. Understand the role of engineering drawings in the design process and how they are used in manufacturing and construction.
Indicative Contents المحتويات الإرشادية	• Readings, self-learning, panel discussions. • Exercises and activities in the lecture. • Homework. • Directing students to some websites to benefit and develop capabilities. • Conducting seminars to explain and analyze a specific issue and find solutions to it.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Explanation and clarification through lectures. 2. The method of displaying scientific materials on display devices: data show, smart boards, and plasma screens. 3. Self-learning through homework and mini-projects within the lectures. 4. Halls of application for engineering drawing 5. Graduation projects. 6. Summer training through the application in the design department

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO # 3,4,5,6 and 7
	Assignments	2	10% (10)	2, 12	LO # 4,5 and 6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 4 and 6
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 3-5
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري الكورس الاول	
	Material Covered
Week 1	Principles of engineering drawing + duties
Week 2	Principles of engineering drawing + duties
Week 3	Engineering Operations(divide the line and angle into equal number of parts+ draw the parallel lines)+Duties
Week 4	Engineering Operations(draw pentagram shape)+ Duties
Week 5	Engineering Operations (draw hexagram shape)+ Duties
Week 6	Engineering Operations (draw an arc touching two given lines+ an arc tangent an arc and line)+ Duties
Week 7	Engineering Operations (draw an arc tangent to two circles)+ Duties
Week 8	Engineering Operations (draw ellipse shape)+ Duties
Week 9	Drawing projections + duties
Week 10	Drawing projections + duties
Week 11	Drawing projections + duties
Week 12	Drawing missed views + Duties
Week 13	Drawing missed views + Duties
Week 14	Drawing missed views + Duties
Week 15	Drawing missed views + Duties

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	الرسم الهندسي / عبد الرسول الخفاف	Yes
Recommended Texts	1- Textbook of Engineering Drawing Second Edition, K. Venkata Reddy 2-mechine drawing, 3rd edition, Dr. K.L.Narayana, Dr.P.Kannaiah , and K. Venkata Reddy	internet
Websites	websites & YouTube	

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	**Applied Science**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM114**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Mechanic	**College**	Enginering	
Module Leader	Hayder Abdulhasan Abbood		**e-mail**	Hayder.abood@uobasrah.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**		2.0

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 Aims أهداف المادة الدراسية	The objective of the Applied Science is to acquaint the students with the basic phenomenon/concepts of chemistry and physics, the student face during course of their study in the industry and Engineering field. The student with the knowledge of the basic chemistry and physics , will understand and explain scientifically the various chemistry and physics related problems in the industry/engineering field. The student will able to understand the new developments and breakthroughs efficiently in engineering and technology. The introduction of the latest (R&D oriented) topics

	will make the engineering student upgraded with the new technologies. 1. To appreciate the need and importance of engineering chemistry and physics for industrial and domestic use. 2. To gain the knowledge on existing and future upcoming materials used in device fabrication. 3. To impart basic knowledge related to material selection and the techniques for material analysis. 4. To impart knowledge of green chemical technology and its applications. 5. To provide an insight into latest (R&D oriented) topics, to enable the engineering student upgrade the existing technologies and pursue further research. 6. To enhance the thinking capabilities in line with the modern trends in engineering and technology.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After the completion of the course, the learner will be able to: **A part 1** A1-Understand the causes of corrosion, its consequences and methods to minimize corrosion to improve industrial designs. A2- Equipped with basic knowledge of polymer reinforced composites, applications of semiconductor photochemistry in energy harnessing and optical sensors. A3- Understand the principle of nuclear reactions. A4-Acquire Basic knowledge of Nanochemistry to appreciate its applications in the field of Medicine, data storage devices and electronics. **B PART 2** B1. Understand the constraints facing the engineer in making the right decision B2. Basic Mathematics and Science B3. Techniques used B4- physics ideas and concepts
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Physics Units & Numbers, One-Dimensional Kinematics, Free Fall 2D Motion, , Newton's Laws of Motion, Friction, Work, Kinetic Static Fluids Buoyant Forces, Bernouli.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Explanation and clarification through lectures. 2- Display scientific materials with projectors: data show, smart boards, plasma screens. 3- Self-learning through homework and mini-projects within the lectures. 4- Laboratories. 5- Graduation projects. 6- Scientific visits.

	7- Seminars held in the department. 8- Summer training. Assessment methods 1- Short exams (Quiz). 2- Homework. 3- Semester and final exams for theoretical and practical subjects. 4- Small projects within the lesson. 5- Interaction within the lecture. 6- Reports.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	113	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7.53
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Atomic structure and octet theorem, valance bond theory and Molecular orbital theory
Week 2	Corrosion and its causes+ Potential electrodes and electrochemical cells
Week 3	Types of corrosion cells ,Corrosion treatment methods Cathodic and Anodic protection

Week 4	Types of polymers and methods of polymerization and Chemical
Week 5	mechanical properties of polymers +Polymer manufacturing methods
Week 6	Types of cement and its applications Chemical composition and Mechanical properties and cement industry
Week 7	Nuclear reactions and their types
Week 8	Nanochemistry
Week 9	Physics Units & Numbers one One-Dimensional Kinematics, Free Fall
Week 10	2D Motion, Projectiles , Newton's Laws of Motion
Week 11	Frictionamd Work, Kinetic and Potential Energy
Week 12	Static Fluids , Buoyant Forces, Bernouli Mid-term Exam + Conservation of Mechanical Energy
Week 13	Ideal Gases and Kinetic Theory, Heat: Temperature Changes
Week 14	Thermodynamics Vibrations; Simple Harmonic Motion
Week 15	Wave properties of light
Week 16	Sound, Intensity and Level **Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	- Engineering Chemistry: Fundamentals and Applications, Cambridge University Press; 2 edition (2019) -Halliday & Resnick & Walker, Fundamental of Physics,10th edition.	Yes
Recommended Texts	- Bharathi Kumari, "Engineering Chemistry", VGS Book .Links, 10th Edition, 2018 -Raymond A. Serway, John W. Jewett, Jr. , PHYSICS for Scientists and Engineers with Modern Physics,7 th edition.	No
Websites	https://www.jove.com/education/chem https://www.physicsclassroom.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
	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	**Computer I**			**Module Delivery**	
Module Type	Support			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOB103				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Zainab Karim Radhi		**e-mail**	Zainab.radhi@uobasrah.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		MSc
Module Tutor	Zainab Karim Radhi		**e-mail**	Zainab.radhi@uobasrah.edu.iq	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	The theoretical foundations of computer engineering have expanded substantially in recent years. The objective of this course is to introduce students to this fundamental area of computer science which enables students to focus on the study of programming languages. These languages allow the students to assess what could be achieved through computing when they are using it to solve problems in science and engineering. The course exposes students to the programming with C++, as well as to its usage for problem solving. The course introduces basic programming instructions and their properties, and the necessary mathematical libraries to develop different software applications. Upon completion of this course the students are expected to become proficient in key topics of C++ programming, and to have the opportunity to explore the current topics in this area.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the importance of using algorithm and process flowcharts as an introduction to understanding programming 2. Clarify the basic concepts of programming in C++ through a set of programming instructions. 3. Gain skills in handling programming problems and issues. 4. Acquiring basic skills as an introduction to building large and applied programs. 5. Ability to program and design application programs. 6. The ability to think about addressing a particular problem or issue. 7. Writing scientific reports. 8. The ability to gain experience in dealing with programmed systems.
Indicative Contents المحتويات الإرشادية	1. Readings, self-learning, panel discussions. 2. Exercises and activities in the lecture. 3. Homework. 4. Directing students to some websites to benefit and develop capabilities. 5. Conducting seminars to explain and analyze a specific issue and find solutions to it.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Explanation and clarification through lectures. 2. The method of displaying scientific materials on display devices: data show, smart boards, and plasma screens. 3. Self-learning through homework and mini-projects within the lectures. 4. Laboratories. 5. Graduation projects. 6. Scientific visits. 7. Seminars held in the department. 8. Summer training

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	13	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.86
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2,3,4,6
	Assignments	2	10% (10)	2, 12	LO # 1, 2,3,4,5,6
	Projects / Lab.	1	10% (10)	Continuous	All
	Lab.	1	10% (10)	13	LO # 1, 2,3,4,5,6
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction-Algorithms-Example of Algorithms
Week 2	Flowcharts-Symbols and Idiomatic Forms in Flowcharts- Types of Flowcharts
Week 3	Completing the topic of Flowcharts type-Example of Flowcharts
Week 4	Basics of programming in C++ language program parts- language components (language codes, special words, variables)
Week 5	Office functions, types of variables, logical expressions
Week 6	Arithmetic tools- priority of arithmetic and logical operations- illustrative examples
Week 7	Input and output order- Directing characters- Formatted console for input and output operations

Week 8	Completing the Formatted console for input and output operations- illustrative examples
Week 9	Conditional Statements (if statement- if-else statement-if-else-if statement-Compound if)
Week 10	Conditional Statements (switch statement-Conditional Ternary Operator- illustrative examples)
Week 11	Loop Statements (for-statement, while-statement- do-while statement-illustrative examples)
Week 12	Loop Statements (Nested Loop Statements- illustrative examples)
Week 13	One-Dimensional Arrays-illustrative examples
Week 14	Two- Dimensional Arrays- Operations on Arrays
Week 15	Completing the topic of operations on Arrays-illustrative examples
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Steps to create, compile and implement a program using Microsoft visual C++ 6.0
Week 2	Lab 2: Implement programs for conditional statements (if-statement)
Week 3	Lab 3: Implement programs for conditional statements (switch-statement)
Week 4	Lab 4: Implement programs for Loop statements (for-statement)
Week 5	Lab 5: Implement programs for conditional statements (while-statement, do-while-statement)
Week 6	Lab 6: Implement programs for Array (one dimension)
Week 7	Lab 7: Implement programs for Array (two-dimension)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		
Recommended Texts	أسس نفسك في البرمجة بأستخدام لغة C++	No
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.

2MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Human Rights and Democracy**			**Module Delivery**	
Module Type	**Basic**			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOB102**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Depart. of Mech. Eng.	**College**	College of Engineering	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Hussian		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**		2.0

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 Aims أهداف المادة الدراسية	1. To provide an understanding of the fundamental concepts and principles of freedom and human rights. 2. To explore the different aspects of freedom, including intellectual, cultural, political, economic, and social freedoms. 3. To examine the relationship between human rights, democracy, and the Universal Declaration of Human Rights. 4. To analyze the various types of democracy and their applications. 5. To address the challenges and future prospects of public freedoms and democracy.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamental concepts and principles of freedom and human rights. 2. Analyze the different dimensions of freedom, including intellectual, cultural, political, economic, and social freedoms. 3. Evaluate the significance of the Universal Declaration of Human Rights in promoting human rights globally. 4. Examine the intersection of freedom and democracy, including the concept of democracy in Islam. 5. Compare and contrast different types of democracy and their practical applications. Critically analyze the challenges and opportunities related to public freedoms and democracy.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction to Human Rights and Democracy: Overview of the course objectives and structure, Introduction to fundamental concepts of freedom and human rights, Fundamental Freedoms: Intellectual freedom and cultural freedom, Freedom in Politics: Political freedom, Overview of different political systems and their impact on human rights (6hrs) • Economic and Social Freedom: Economic freedom, Social freedom, The Future of Public Freedoms: Emerging challenges and opportunities in the context of public freedoms, Universal Declaration of Human Rights and Freedoms: Overview of the Universal Declaration of Human Rights and its significance, Freedom in Islam: Examination of the concept of freedom in Islamic teachings (6hrs) • Types of Democracy: Introduction to different types of democracy, Democracy and its Application: Analysis of the practical implementation of democracy in various contexts, Administrative and Financial Corruption: Examination of the impact of corruption on human rights and democracy, Democracy in Islam: Exploration of the concept of democracy within Islamic

	principles (8 hrs) • Challenges to Democracy: Analysis of the challenges faced by democratic systems, Protection of Human Rights:, Strategies and mechanisms for the protection of human rights, Democratic Governance: Understanding the principles and practices of democratic governance, Conclusion and Future Perspectives: Review of key concepts and discussions on the future prospects of human rights and democracy(8hrs)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Here are some suitable learning and teaching strategies for the course "Human Rights and Democracy": Lectures: Conduct engaging lectures to introduce and explain the fundamental concepts of freedom, human rights, and democracy. Use multimedia resources, case studies, and real-life examples to illustrate the practical applications and challenges related to human rights and democracy. Encourage student participation through interactive discussions, questions, and debates to promote critical thinking and deeper understanding of the topics. Group Discussions and Debates: Organize group discussions and debates to encourage students to critically analyze and evaluate different perspectives on human rights and democrcy

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Human Rights and Democracy: • Overview of the course objectives and structure • Introduction to fundamental concepts of freedom and human rights
Week 2	Fundamental Freedoms: • Intellectual freedom and cultural freedom
Week 3	Freedom in Politics: • Political freedom • Overview of different political systems and their impact on human rights
Week 4	Economic and Social Freedom: • Economic freedom • Social freedom
Week 5	The Future of Public Freedoms: • Emerging challenges and opportunities in the context of public freedoms

Week 6	Universal Declaration of Human Rights and Freedoms: • Overview of the Universal Declaration of Human Rights and its significance
Week 7	Freedom in Islam: • Examination of the concept of freedom in Islamic teachings
Week 8	Types of Democracy: • Introduction to different types of democracy
Week 9	Democracy and its Application: • Analysis of the practical implementation of democracy in various contexts
Week 10	Administrative and Financial Corruption: • Examination of the impact of corruption on human rights and democracy
Week 11	Democracy in Islam: • Exploration of the concept of democracy within Islamic principles
Week 12	Challenges to Democracy: • Analysis of the challenges faced by democratic systems
Week 13	Protection of Human Rights: • Strategies and mechanisms for the protection of human rights
Week 14	Democratic Governance: • Understanding the principles and practices of democratic governance
Week 15	Conclusion and Future Perspectives: • Review of key concepts and discussions on the prospects of human rights and democracy
Week 16	**Preparatory week before the final Exam**

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		
	Text	**Available in the Library?**
Required Texts	"Human Rights: Politics and Practice" by Michael Goodhart	No
Recommended Texts		
Websites	https://www.ohchr.org/en/ohchr_homepage	

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.

2MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Arabic Language I**			**Module Delivery**	
Module Type	**Basic**			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOB104**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Depart. of Mech. Eng.	**College**	College of Engineering	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. العمل على النهوض باللغة العربية والمحافظة عليها من الخطأ 2. معرفة الطالب جمالية الاسلوب القرأني واعجازه البلاغي ليكون النموذج الامثل في الصياغة والتعبير 3. تنمية مهارات الطالب الاملائية 4. مساعدة الطالب على معرفة الطريقة الصحيحة في كتابة الاعداد وقراءتها وكتابة الهمزة بانواعها 5. مراجعة قواعد اللغة العربية لتجنب وقوع الطالب في الخطأ النحوي 6. تنمية مهارات الطالب على تذوق جمال التعبير الادبي ومحاكاة النصوص الجميلة في الكتابة 7. مساعدة الطالب على تمييز الاغلاط اللغوية الشائعة وارشاده الى تصويبها 8. تنمية مهارة الحفظ والالقاء
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. حب الطالب للغة العربية والاعتزاز بها 2. اكتساب الطالب القدرة على فهم الاعجاز اللغوي في النصوص القرأنية والاحساس بجماليتها 3. معرفة الطالب طريقة التفريق بين انواع الهمزة الاولية والمتوسطة والمنتهية والقدرة على كتابتها بالشكل الصحيح دون الوقوع في الخطأ 4. قدرة الطالب على التفريق بين الظاء والضاد وعدم الوقوع في اشكالية الخلط بينهما 5. قدرة الطالب على الكتابة دون الوقوع في الخطأ الاملائي والنحوي 6. تمكن الطالب من قراءة النصوص الادبية بلغة فصحى صحيحة ومضبوطة بالحركات 7. القدرة على التعبير الادبي بلغة جميلة سليمة 8. تمكن الطالب من معرفة اكثر من خمسين خطأ شائعاً ومعرفة تصويبها
Indicative Contents المحتويات الإرشادية	**1.**مقدمة • أهمية تعلم اللغة العربية. • التعريف بأهداف المادة ودورها في تنمية مهارات التواصل. **2.**المحتويات الأساسية أ .الحروف والأصوات • التعرف على الحروف الهجائية (28 حرفًا). • تمارين نطق الحروف. • أنشطة للتفرقة بين الأصوات المتشابهة. ب .المفردات الأساسية • كلمات تتعلق بالأسرة (أفراد العائلة). • أسماء الأشياء اليومية (الألوان، الأشكال، الأعداد). • أفعال بسيطة تعبر عن الأنشطة اليومية. ج .القراءة والكتابة • قراءة نصوص بسيطة (قصص قصيرة، أبيات شعرية). • تمارين كتابة الحروف والكلمات. • أنشطة ربط الصور بالكلمات المكتوبة.

	د .الاستماع والتحدث • أنشطة استماع لمواقف حياتية (مثل: التسوق، المدرسة). • تمارين محادثة (تعريف النفس، الحديث عن الهوايات). • استخدام الألعاب والدراما لتعزيز مهارات التحدث. **3.**استراتيجيات التدريس • التعلم من خلال اللعب (ألعاب لغوية وتفاعلية). • استخدام الوسائط المتعددة (فيديوهات، مقاطع صوتية). • العمل الجماعي والفردي لتشجيع التفاعل. **4.**التقييم والمتابعة • تقويم مستمر من خلال الملاحظات اليومية. • امتحانات قصيرة في نهاية كل وحدة. • مشاريع بسيطة تعكس ما تم تعلمه. **5.**الأنشطة المكملة • زيارات ميدانية (مكتبة، متحف). • ورش عمل فنية (كتابة القصص، رسم الشخصيات). • حفلات قراءة للطلاب لتعزيز الثقة بالنفس. **6.**الوسائل التعليمية • بطاقات تعليمية. • قصص مصورة. • مواد سمعية بصرية تدعم التعلم. ملاحظات ختامية • يشدد على أهمية المشاركة الفعالة للطلاب في العملية التعليمية. • ينبغي للمعلمين تعديل الأنشطة وفقاً لاحتياجات الطلاب ومستوياتهم. هذا المحتوى الإرشادي يهدف إلى توفير توجيهات واضحة لمعلمي اللغة العربية في المستوى الأول، ويعزز من تجربة التعلم لدى الطلاب

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**1.**التعلم النشط • **التعلم من خلال اللعب :**استخدام الألعاب التعليمية لتشجيع الطلاب على المشاركة والتفاعل مع المحتوى.

- **المشاريـع الجماعية :**تنظيم أنشطة جماعية مثل كتابة قصة قصيرة أو تمثيل مشهد درامي.

2.التعلم بالاستكشاف

- **التعلم القائم على الاستفسار :**تشجيع الطلاب على طرح الأسئلة والبحث عن الإجابات من خلال الأنشطة الموجهة.
- **استكشاف البيئة :**القيام بزيارات ميدانية لمواقع قريبة لتعزيز فهم المفردات المتعلقة بالبيئة المحيطة.

3.التعلم التعاوني

- **المجموعات الصغيرة :**تقسيم الطلاب إلى مجموعات صغيرة للعمل على مهام معينة، مما يعزز التعاون والتفاعل.
- **التبادل اللغوي :**تشجيع الطلاب على التحدث مع بعضهم البعض ومشاركة الأفكار والمفردات.

4.التقنيات الحديثة

- **استخدام الوسائط المتعددة :**توظيف الفيديوهات، والتطبيقات التعليمية، والألعاب الإلكترونية لتعزيز التعلم.
- **المحتوى الرقمي :**استخدام القصص الصوتية والمحتوى التعليمي الإلكتروني لتعزيز مهارات الاستماع والقراءة.

5.التعلم القائم على المشاريـع

- **مشاريـع فنية :**مثل رسم شخصيات من قصص تم قراءتها أو إنشاء ملصقات تعبر عن موضوعات معينة.
- **كتابة القصص :**يشجع الطلاب على كتابة قصص قصيرة باستخدام المفردات الجديدة.

6.التغذية الراجعة المستمرة

- **التقييم الذاتي :**تشجيع الطلاب على تقييم تقدمهم من خلال أوراق العمل والنشاطات.
- **التغذية الراجعة الفورية :**تقديم ملاحظات فورية للطلاب بعد الأنشطة لضمان الفهم الصحيح.

7.التفاعل الاجتماعي

- **المناقشات الصفية :**تنظيم مناقشات حول المواضيع التي تم تناولها لتعزيز مهارات التعبير الشفوي.
- **القصص المشتركة :**دعوة الطلاب لمشاركة تجاربهم الشخصية من خلال سرد القصص.

ملاحظات ختامية

- يجب أن تكون الأنشطة مرنة وقابلة للتكيف مع احتياجات ومستويات الطلاب.
- ينبغي أن تعزز استراتيجيات التعليم الشعور بالثقة والقدرة على التعبير لدى الطلاب.

تساعد هذه الاستراتيجيات في خلق بيئة تعليمية تفاعلية تعزز من مهارات اللغة العربية لدى الطلاب في المستوى الأول.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	درس بيان اهمية اللغة العربية بصورة عامة واهميتها لطلاب غير التخصص
Week 2	اقسام الكلام والمعرب والمبني من الاسماء والافعال

Week 3	المثنى والملحق به
Week 4	انواع الجموع وما يلحق به
Week 5	الاسماء الخمسة
Week 6	كتابة الاعداد
Week 7	الهمزة الاولية – همزتا القطع والوصل
Week 8	الهمزة المتوسطة والمنتهية
Week 9	الاعجاز اللغوي في القران الكريم نماذج وتطبيقات
Week 10	الاسماء الخمسة
Week 11	الافعال الخمسة
Week 12	الاغلاط اللغوية الشائعة
Week 13	كتابة الظاء والضاد والتاء المربوطة والهاء
Week 14	درس التعبير ونماذج من اساليب اشهر الكتاب الادبية
Week 15	قصيدة لشاعر قديم ولشاعر حديث
Week 16	التحضير للامتحان النهائي

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		
	Text	**Available in the Library?**
Required Texts	النحو الواضح/ علي حازم لمسات بيانية/ فاضل السامرائي منهج اللغة العربية للاقسام غير الاختصاص	لا
Recommended Texts	معجم الاخطاء اللغوية والنحوية الشائعة/ خضر ابو العينين معاني النحو/ فاضل السامرائي الاعمال الشعرية الكاملة/ نازك الملائكة/ المعلقات	لا
Websites	https://ketabpedia.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
	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	**Mathematics II**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM121**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Mohammed Bakir Mohsen		**e-mail**	mohammed.mohsen@uobasrah.edu.iq	
Module Leader's Acad. Title		Lecture	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	The primary goal of this course is to teach the students many things they need to know about the use mathematical techniques to solve problems of different types of functions, use of direct integration and differentiation by many kinds of techniques. A review of fundamental mathematical methods and calculus of a different types of functions, derivatives of function, techniques of integrations. In Cartesian and polar coordinates. From general information, formulate a mathematical model. Students should also be able to validate results and draw conclusions. That will allow students to understand and solve problems that come up in the applied sciences.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Clarify the fundamental concepts of mathematics, science, and engineering and their applications in social and industrial fields. 2- Acquiring skills to design an integrated system and its various components and processes, within realistic economic, environment, social, political, ethical, health and safety, manufacturability, and sustainability constraints. 3 - The ability to identify and analyze engineering problem and to apply the fundamental mathematics, science, and engineering concepts to solve it. 4- an ability to outline and conduct experiments as well as analyze and interpret data. 5 - an understanding of the responsibility of engineers to practice in a professional and ethical manner at all times. 6-Use mathematical techniques to solve problems of different types of functions. 7-Use of direct integration and differentiation by many kinds of techniques. 8-From general information, formulate a mathematical model. Students should also be able to validate results and draw conclusions. 9. Writing scientific reports.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- **Applications of Integration :** Area Between two curves, The Volume by using the Disk Method, The Volume by using Washer method, Volumes by Cylindrical Shells, Solids with Known Cross Sections, Lengths of Plane Curves, Areas of Surfaces of Revolution. [20 hrs] 2- **Integration Techniques:** Basic Integration Formulas, Integration by Parts, Trigonometric Integrals, Trigonometric Substitutions, Integration of Rational Functions by Partial Fractions. [24 hrs] 3- **Numerical Integration :** The Trapezoidal Rule, The Simpson's Rule. [8 hrs] 4- **Polar Coordinate :** Graphing in Polar Coordinates, Areas and Lengths in Polar Coordinates. [8 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Reading and self-learning. • Training and activities during lecture.

	• HomeWorks. • Suggesting some websites for extra reading. Discussions and workshops.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Area Between two curves, The Volume by using the Disk Method,
Week 2	The Volume by using Washer method, Volumes by Cylindrical Shells
Week 3	Solids with Known Cross Sections,
Week 4	Lengths of Plane Curves
Week 5	Areas of Surfaces of Revolution.

Week 6	Basic Integration Formulas
Week 7	Integration by Parts
Week 8	Trigonometric Integrals,
Week 9	Trigonometric Substitutions
Week 10	Trigonometric Substitutions
Week 11	Integration of Rational Functions by Partial Fractions.
Week 12	The Trapezoidal Rule.
Week 13	The Simpson's Rule.
Week 14	Graphing in Polar Coordinates
Week 15	Areas and Lengths in Polar Coordinates.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas' Calculus I Maurice D. Weir, Joel Hass, George B. Thomas.-12th ed.	Yes
Recommended Texts	Advanced Engineering Mathematics, By Erwin Kreyszig, 1999, John Wiley & Sons, Inc	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Mechanics Dynamics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MEB122**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name D. Raad Jamal Jassim		**e-mail**	Raad.jassim@uobasra.edu.iq	
Module Leader's Acad. Title		Assistant Prof.	**Module Leader's Qualification**		
Module Tutor	M.Sc. Huda Abdullah Abdulkareem		**e-mail**	Huda.abdulalkareem@uobasra.edu.iq	
Peer Reviewer Name		Name	**e-mail**		
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	The theoretical foundations of *Engineering Mechanics Dynamic ha*ve expanded substantially in recent years. The objective of this course is to introduce students to this fundamental area of *Engineering Mechanics Dynamic* which enables students to focus on the Kinematics of Particles. The course exposes students to the knowing POSITION, VELOCITY, AND ACCELERATION as well as determination of motion of particles, motion of several particles and Dependent Motions. The course introduces basic of Newton's Second Law in Rectangular Components and Tangential and Normal Components and Energy and Momentum Methods and PRINCIPLE OF WORK AND ENERGY, POTENTIAL ENERGY, CONSERVATION OF ENERGY. Upon completion of this course the students are expected to become proficient in *Engineering Mechanics Dynamic*, and to have the opportunity to explore the current topics in this area.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Knowledge and Understanding A1- Clarify the basic concepts of kinetic mechanics. A2- Acquisition of problem-solving skills. A3 - Acquisition of basic skills as an introduction to kinetic mechanics and intertwined in practical applications. A4- Gain a basic understanding of how kinetic mechanics is linked in various industrial applications
Indicative Contents المحتويات الإرشادية	B. Subject-specific skills B - Skills objectives of the course. B1 - The ability to analyze the problem and write the steps for the solution in a simpler way. B2 - The ability to think about addressing a particular problem or issue. B3 - Writing scientific reports. B4 - The ability to gain experience in dealing with complex mechanical systems. .

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Readings, self-learning, panel discussions. • Exercises and activities in the lecture. • Homework. • Directing students to some websites to benefit and develop capabilities. • Conducting seminars to explain and analyze a specific issue and find solutions to it.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - Rectilinear motion of particle
Week 2	Determination of motion of particle
Week 3	Motion of several particles
Week 4	Dependent motion
Week 5	In the case of the motion projectile /Rectangular components of velocity and acceleration
Week 6	Tangential and normal components
Week 7	Introduction to Kinetics of particles
Week 8	Newton's Second law Equations of motion
Week 9	Rectangular components

Week 10	Work of a force , Energy and momentum methods
Week 11	Applications of the principle of work and energy
Week 12	Potential energy
Week 13	Direct and oblique central impact
Week 14	Kinematics of rigid bodies
Week 15	Acceleration in plain motion
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Engineering mechanics Dynamics R.C.HIBBELER	NO
Recommended Texts	VECTOR MECHANICS FOR ENGINEERING BEER/JOHNSTION/MAZUREK/EISENBERG	YES
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

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	**Engineering Drawing II**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	**BEM123**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Sana Mahdi Shrama		**e-mail**	sana.mahdi@uobasrah.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. Preparing and qualifying specialized engineers to meet the requirements of the labor market in the private and public sectors in mechanical engineering through diversifying the methods of learning and teaching and training students to apply the acquired knowledge and skills to solve real problems. 2. Providing distinguished academic programs in the field of mechanical engineering, both theoretical and practical, and international rules of academic quality that meet the needs of the labor market. 3. Encouraging and developing scientific research in the fields of mechanical engineering. 4. Preparing a stimulating environment for faculty members to develop their knowledge and educational and research skills
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Knowledge and Understanding A1. Clarify the basic concepts of engineering drawing and the use of AutoCAD in social and industrial fields A2. Acquire the skills to solve the problems. B. Subject-specific skills B1 - The ability to design in the completion of work B2 - The ability to think about the visualization of shapes according to the topics related to the drawing B 3 - The purpose of the engineering drawing is to be used as a guide for the manufacture or implementation of the drawn shape.
Indicative Contents المحتويات الإرشادية	• Readings, self-learning, panel discussions. • Exercises and activities in the lecture. • Homework. • Directing students to some websites to benefit and develop capabilities. • Conducting seminars to explain and analyze a specific issue and find solutions to it.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Explanation and clarification through lectures. 2. The method of displaying scientific materials on display devices: data show, smart boards, and plasma screens. 3. Self-learning through homework and mini-projects within the lectures. 4. Halls of application for engineering drawing 5. Graduation projects. 6. Summer training through the application in the design department

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	38	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.53
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري الكورس الثاني	
	Material Covered
Week 1	sections + duties
Week 2	sections + duties
Week 3	sections + duties
Week 4	sections +dimensions+ duties
Week 5	sections +dimensions+ duties
Week 6	sections +dimensions+ duties
Week 7	
Week 8	Mid-term Exam + Drawing projections + duties
Week 9	Pictorial drawing +Duties

Week 10	Pictorial drawing +Duties
Week 11	Pictorial drawing +Duties
Week 12	Pictorial drawing +Duties
Week 13	Pictorial drawing +dimensions+ Duties
Week 14	Pictorial drawing +dimensions+ Duties
Week 15	Pictorial drawing +dimensions+ Duties
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	الرسم الهندسي / عبد الرسول الخفاف	Yes
Recommended Texts	1- Textbook of Engineering Drawing Second Edition, K. Venkata Reddy 2-mechine drawing, 3rd edition, Dr. K.L.Narayana, Dr.P.Kannaiah , and K. Venkata Reddy	internet
Websites	websites & YouTube	

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	**Electrical Engineering**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM124**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Mechanical Engineering		**College**	Engineering	
Module Leader	Alaa Jasim Majid		**e-mail**	alaa.jasim@uobasrah.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	M.Sc	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/10/2024		**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. AC circuits – Time dependent signals, average and RMS values. energy storage elements, simple AC steady-state sinusoidal analysis. Phasor diagrams, AC circuit analysis with complex numbers. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	58	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.86
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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Modern electron theorem
Week 2	SI units
Week 3	Resistance and resistivity
Week 4	Effect of temperature on resistance
Week 5	Kirchhoff's lows
Week 6	Type of DC circuits
Week 7	Sources of energy
Week 8	Maxwell's circulating current
Week 9	Nodal analysis

Week 10	Superposition theorem
Week 11	Thevenin's theorem
Week 12	Norton's theorem
Week 13	Generation of AC Voltage
Week 14	Average value and effective value
Week 15	Generation of AC Voltage

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Measurement of current, potential difference and resistance
Week 2	Lab 2: An investigation of Ohm's and Kirchhoff's laws
Week 3	Lab 3: Measurements in resistors and continuous feeding circuits
Week 4	Lab 4: Thevenin and Superposition theorem
Week 5	Lab 5: Maximum power transfer theorem
Week 6	Lab 6: Oscilloscope
Week 7	Lab 7: Resonance in alternating current circuits

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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	**Production Engineering**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM125**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		1	**Semester of Delivery**		2
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Raheem Khazal Al-Sabur		**e-mail**	raheem.musawel@uobasrah.edu.iq	
Module Leader's Acad. Title		Asst Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. To provide an understanding of the classification, properties, and testing methods of engineering materials. 2. To explore the production processes of ferrous and non-ferrous metals, plastics, ceramics, and powder metallurgy. 3. To introduce the principles and analysis of cold and hot working processes, including rolling, extrusion, drawing, and welding technologies. 4. To familiarize students with various casting techniques and the principles of the casting sandy process.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Classify engineering materials and describe their mechanical properties. 2. Conduct destructive and non-destructive tests on engineering materials. 3. Explain the production processes of cast iron, steel, copper, aluminum, zinc, lead, tin, plastics, ceramics, and powder metallurgy. 4. Understand the principles and analyze force requirements in hot rolling, hot extrusion, and hot drawing processes. 5. Identify different welding processes and their applications. 6. Describe the types and analyze the force requirements in various hot and cold working processes. 7. Explain the principles and processes involved in various casting techniques.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Engineering materials included classification of engineering materials, mechanical properties of materials, destructive and non-destructive tests such as tensile test and impact test, and hardness test (8hrs) • Ferrous and non-ferrous metal production, which is covered iron ores, blast furnace, iron production, steel production, Besmer convertor, open hearth, oxygen converter, open hearth furnace, electric-arc steelmaking furnace, extraction of aluminum, copper ores, copper extraction, lead production, zinc production, tin production (20 hrs) • Plastic production, properties of plastics, structure of polymers, thermo-plastics, thermo-setting plastics, extrusion of plastic, injection molding, structural foam molding, blow molding, reaction injection molding, rotational molding, thermoforming (8hrs) • Ceramics production, ceramics classification, properties of ceramic, ceramic manufacturing equipment, main steps for ceramic manufacturing (4hrs) • Cold and hot working included metal forming, recrystallisation temperature, purpose of cold working, advantages of cold working, disadvantages of cold working, advantages of hot working, disadvantages of hot working (4hrs) • Hot working process, hot rolling, principles of rolling processes, rolling types, force analysis in rolling, hot extrusion, principles of extrusion processes,

	extrusion types, force analysis in extrusion, drawing process, types of hot drawing, wire drawing, deep drawing, tube drawing (12hrs) • Welding process, welding joints, welding positions, classification of welding processes, oxy-acetylene welding, shielded metal arc welding, gas metal arc welding, tungsten inert gas welding, submerged arc welding, resistance welding, friction welding (4hrs) • Powder metallurgy, advantages of powder metallurgy, limitations of powder metallurgy, production of metal powders, characteristic of metal powders (4hrs)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to provide a comprehensive understanding of the materials and processes involved in production engineering. The goal is to engage students and foster their critical thinking skills through interactive and practical learning experiences. Here are some suitable learning and teaching strategies for the various topics: 1. Engineering Materials: • Lecture-based sessions to introduce the classification and mechanical properties of engineering materials. • Group discussions and case studies to explore real-world applications and challenges related to materials selection. • Laboratory sessions to demonstrate destructive and non-destructive tests on materials, allowing hands-on experience. 2. Ferrous Metal Production and Non-Ferrous Metal Production: • Combination of theoretical lectures and visual presentations to explain the production processes of cast iron, steel, copper, aluminum, zinc, lead, and tin. • Guest lectures or industry visits to provide practical insights and showcase real-world applications of these metal production techniques. 3. Plastic Industry and Ceramic Industry: • Lectures and multimedia presentations to cover the properties, classification, and production processes of plastics and ceramics. • Demonstrations of plastic molding and ceramic shaping techniques to provide students with a practical understanding of the manufacturing processes. 4. Cold and Hot Working, Hot Rolling, Hot Extrusion, and Drawing Process: • Interactive lectures with visual aids to explain the principles and types of cold and hot working processes, as well as the force analysis involved. • Hands-on activities, such as laboratory experiments or workshops, to

	simulate rolling, extrusion, and drawing processes, allowing students to understand the practical aspects and challenges. 5. Welding Technology: • Demonstrations of different welding processes and techniques, accompanied by explanations of their applications and advantages. • Practical sessions where students can practice welding under the supervision and guidance of experienced instructors. • Guest lectures by industry professionals to share their expertise and provide insights into the welding industry. 6. Casting and Powder Metallurgy: • Multimedia presentations and visual demonstrations to explain the different casting techniques and the principles of the casting sandy process. • Group projects or case studies where students can design and simulate casting processes for specific components. • Practical sessions or workshops to demonstrate the principles and applications of powder metallurgy, allowing students to handle and analyze powdered materials.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	122	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Engineering Materials: Classification of engineering materials, Mechanical properties of materials
Week 2	Engineering Materials: Destructive and non-destructive tests
Week 3	Ferrous Metal Production: Production of cast iron
Week 4	Ferrous Metal Production: Steel production
Week 5	Non-Ferrous Metal Production: Copper metal production
Week 6	Non-Ferrous Metal Production: Aluminum metal production
Week 7	Non-Ferrous Metal Production: Zinc, lead, and tin production
Week 8	Plastic Industry: Properties and classification of plastics
Week 9	Plastic Industry: Plastics production
Week 10	Ceramic Industry: Classification of ceramics, Ceramics production
Week 11	Cold and Hot Working: Principles of cold and hot working processes
Week 12	Hot Rolling: Principles of rolling processes, Rolling types, Force analysis in rolling
Week 13	Drawing Process: Types of hot drawing, Drawing analysis
Week 14	Hot Extrusion: Types of hot extrusion, Force analysis in extrusion
Week 15	Powder Metallurgy: Principles of powder metallurgy, Powder metallurgy production Casting: Casting types, Casting sandy process
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: workshop of sharper machine
Week 2	Lab 2: workshop of drilling machine
Week 3	Lab 3: workshop of lathe machine
Week 4	Lab 4: workshop types of Files Tools
Week 5	Lab 5: workshop of Plumber
Week 6	Lab 6: workshop of Milling
Week 7	Lab 7: workshop of Carpentry
Week 8	Lab 8: workshop of Casting
Week 9	Lab 9: workshop of welding

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Introduction to Basic Manufacturing Processes and Workshop Technology Book by Rajender Singh https://blogpuneet.files.wordpress.com/2013/07/introduction-to-basic-manufacturing-processes-and-workshop-technology.pdf	No
Recommended Texts		
Websites	https://www.aboutmech.com/ https://faculty.uobasrah.edu.iq/faculty/en/1660/teaching	

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	**English Language I**	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOB101**		
ECTS Credits	**2**		
SWL (hr/sem)	**50**		

Module Level	1	**Semester of Delivery**	2
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Ameen Ahmed Nassar	**e-mail**	Ameen.nassar@uobasrah.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/10/2024	**Version Number**	2.0

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 Aims أهداف المادة الدراسية	1. To develop understanding of English Language 2. To understand Grammar of the English Language 3. This course deals with the basic concept of English Language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how Grammar of English Language work. 2. List the various terms associated with English Language. 3. Summarize what is meant by Technical English. .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Nouns, Pronouns, Adjectives, Determiners, Verb & Tenses, Auxiliary Verbs, Verbs and Adverbs Phrases, Preposition and Prepoitional Phrases, Conjunctions, Sentenses, Direct and Indirect Speech, Punicutios, Presents Continous for Future Use, Linking words, Tips for Learning Irregular Verbs, [30 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple conversations involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Nouns
Week 2	Pronouns
Week 3	Adjectives
Week 4	Determiners
Week 5	Verbs & Tenses
Week 6	Auxiliary Verbs
Week 7	Adverbs and Adverbs Phrases
Week 8	*Prepositions and Prepositional Phrases*
Week 9	*Conjunctions*
Week 10	*Sentences*
Week 11	*Direct and Indirect Speech*
Week 12	*Punctuation*
Week 13	Presents Continuous for Future Use
Week 14	Linking words
Week 15	Tips for Learning Irregular Verbs
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Basic English Grammar, Book 2, SADDLEBACK,.	Yes
Recommended Texts	Free English Grammar, Level 2, Ebook.	yes
Websites	Available online. https://preply.com/en/learn	

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	**Engineering Mathematics I**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM211**				
ECTS Credits	6				
SWL (hr/sem)	**150**				
Module Level		2	**Semester of Delivery**		3
Administering Department			**College**		
Module Leader	Yahya Muhammed Ameen		**e-mail**	yahya.ameen@uobasrah.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		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	The main objectives of this course is to teach the students the basics of matrices and vector analysis and their applications in mechanical engineering. The student also teaches vector analysis by studying several topics such as the basics of vectors and algebraic operations that can be performed on vectors and applying these topics in calculating vector functions such as directional derivatives, divergence and curl and thus applying them in calculating line, surface and volume integrals and then the student will be able to apply it in various topics related to mechanical engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Knowledge and Understanding: By the end of the course, the student will be able to: A1. Use mathematical methods to solve engineering problems. A2. Use linear algebra tools to solve systems of linear equations. A3. Use vector analysis to solve many engineering problems. B. Subject-specific skills: The ability to solve engineering problems and how to deal with them mathematically and choosing the appropriate methods for solving.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Unit I - Matrices Properties of matrices, matrices types, Operations on matrices determinants, inverse of matrices, solution of linear simultaneous equations. [20 hrs.] Unit II – Vector Calculus Forms of a curve equation in space, parametric equations, unit tangent vectors, curvature, radius of curvature, motion along a curve, velocity, acceleration and speed, normal and tangential components of acceleration. [12 hrs.] Unit III – Vector Valued Functions Scalars and vectors, components of a vector, rules of vector arithmetic, norm of a vector, normalizing of vectors, dot product, cross product, product of three or more vectors, equations of lines and planes in 3-space. [16 hrs.] Unit IV – Multiple Integrals Double integrals, areas and volumes, double integrals in polar coordinates, surface area. [12 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and some activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.86
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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hrs.	10% (10)	7	LO # 1-7
	Final Exam	2 hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Properties of Matrices, Types of Matrices
Week 2	Operations on Matrices (Algebra of Matrices), Partitioning of Matrices
Week 3	Determinants
Week 4	Inverse of Matrix
Week 5	Linear Equations systems
Week 6	Vectors Calculus
Week 7	Dot (or Scalar) Product
Week 8	Cross (or Vector) Product
Week 9	Lines and Planes in 3-Space
Week 10	Unit Tangent Vectors and Unit Normal Vectors
Week 11	Directional Derivative
Week 12	Divergence and Curl
Week 13	Double Integrals
Week 14	Triple Integrals
Week 15	Polar Coordinates in Double and Triple Integrals
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Advanced Engineering Mathematics, Dennis G. Zill, Loyola Marymount University. Sixth edition.	No
Recommended Texts	Thomas' Calculus, Maurice D. Weir, Joel Hass, George B. Thomas.-12th ed.	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Fluid mechanics			**Module Delivery**	
Module Type	Core			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	BEM212				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level		2	**Semester of Delivery**		3
Administering Department		Mechanical Engineering	**College**	College of Engineering	
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. Giving a preliminary idea of fluids' most important mechanical properties and introducing their laws. 2. Introducing the student to the laws of calculating forces on the surfaces of reservoirs, ships, dams, and others. 3. Preparing and qualifying specialized engineers to meet the labour market requirements in the private and public sectors in mechanical engineering. This is through diversifying learning methods and education and training students to apply the acquired knowledge and skills to solve real problems. 4. Helping the student to understand the important equations that control the movement of fluids (continuity equation, energy equation, Euler equation, Bernoulli equation) and the different applications of these equations. 5. Definition of the types of flow. 6. Definition of velocity distribution and calculation of shear stress in pipes. 7. Definition of pipe connection systems. 8. Definition of the external flow and the boundary layer.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The learner can understand the behavior of fluids according to their properties and use them appropriately. 2. Familiarize students with different pressure measurements. 3. Enabling students to measure the level of liquids in containers. 4. The student should know the differences between different pressures and how to measure them. 5. The student should know the forces generated by fluids when they flow and how to calculate these forces. 6. Gain experience in hydraulic systems. 7. Enabling the student to derive mathematical relationships based on laboratory experiments. 8. The student should mention, for example, the properties of physical fluids. 9. The student should know the difference between the types of fluid flow. 10. To distinguish between the equations of flow and their applications. 11. The student should know the difference between static and flowing liquid.
Indicative Contents المحتويات الإرشادية	Types of fluid, law of continuum, properties of fluid, viscosity, Newton's law of viscosity, velocity profile, surface tension, cohesion & adhesion, capillarity/bulk modulus compressibility, compressibility, vaporability & vapor pressure, cavitation, specific density and specific weight, perfect gas law. [15 hr] Defining the absolute and gauge pressures, pressure direction, pressures at a point, and pressure variation with the elevation. [10 hr] Determining the resultant force acting on a submerged plane surface and the vertical and horizontal components on a curved submerged bodies. [15 hr]

	Definition of the buoyancy force and its application in floating bodies. Determining the stabilities of the floating bodies by metacentre. [10 hr] The acceleration in linear and rotational motion. [15 hr] Defining the important dimensionless numbers- The methods of collecting multi variables in a single dimensionless relation. [10 hr] Fluid in motion- Flow lines: pathline, streamline, streakline- flow visualization-The definition of control volume and basic derivatives of the equations of conservation (conservation of mass, momentum and energy)- Euler and Bernoulli equations-Applications of momentum equation of stationary and moving blades. [15 hr] Laminar and turbulent fully developed flow between parallel plates and inside pipes-Friction factor and its relations with Reynolds number and with pipe roughness-Minor losses in fittings such as valves, reduces, expanders, filters, elbows -the overall losses-Multipipes systems. [15 hr] The definition of boundary layer flow, boundary layer thickness, displacement thickness, and momentum thickness-Laminar and turbulent boundary layer over a flat plate, Von Karman theory. [15 hr]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Knowing the questions and inquiries distinguished by depth and accuracy. 2- Simulating the student towards understanding the cause and reason. 3- Increasing the digital sense of expression. 4- Intellectual development.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	137	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	9.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	4, 10	LO #1, 2, and 3
	Tutorials	2	10% (10)	2, 12	LO # 3, 4, 5 and 6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 7, 8 and 9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-11
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General Introduction- Definition of Fluid
Week 2	Pressure acting on a point-Pressure variation with depth
Week 3	Forces on Immersed plane Surfaces
Week 4	Buoyancy & Stability in immerged Bodies
Week 5	Stability in floating Bodies
Week 6	Linear motion with constant acceleration
Week 7	Rotational motion with constant acceleration
Week 8	Dimensionless Analysis & Similarity
Week 9	Introduction to Fluid Motion
Week 10	Applications of Bernoulli Equation
Week 11	Viscous Flow-Entrance Length
Week 12	Laminar flow between Parallel plates & inside a circular pipe
Week 13	Major friction losses for Turbulent Flow- Losses in Noncircular conduits
Week 14	Multiple Piping Systems
Week 15	External flow- Boundary layer

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Hydrostatic pressure
Week 2	Lab 2: Flowlines visualization
Week 3	Lab 3: Verification of Bernoulli Equation
Week 4	Lab 4: Friction Losses in Smooth Pipes
Week 5	Lab 5: Flow Measurement & Energy Losses

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fluid Mechanics" Frank. M. White, 6th edition	Yes
Recommended Texts	Fundamentals of Fluid Mechanics" 5th edition B. R. Munson et al. - John Wiley and Sons.	No
Websites	https://faculty.uobasrah.edu.iq/faculty/287/teaching	

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	**Strength of Materials**		**Module Delivery**		
Module Type	**Core**		☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**		
Module Code	**BEM213**				
ECTS Credits	**9**				
SWL (hr/sem)	**225**				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/10/2024		**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. This course deals with the basic concept of forces and other external stress effects and their effects on the mechanical part. This knowledge is very essential for an engineer, to enable him to design all types of structures and machines. 2. To provide the basic concepts and principles of mechanics of materials and to give the ability to analyze a given problem simply. 3. To give the ability to calculate stresses and deformations of objects under external forces. 4. To give the ability to apply the knowledge of mechanics of materials to engineering applications and design problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Knowledge and Understanding: 1. Clarify the basic concepts of mechanics of materials. 2. Acquire skills in dealing with engineering problems and topics related to mechanical design. 3. Acquisition of basic skills as an introduction to the construction and calculations of mechanical parts and their dimensions. 4. Understand the deformations that occur in the dimensions of mechanical systems as a result of applying forces and moments. B- Subject-specific skills: 1. The ability to calculate various types of stresses. 2. The ability to think about the analysis of a mechanical part subjected to a group of external effects. 3. Writing scientific reports. 4. The ability to gain experience in dealing with mechanical parts to prepare the student for the design subject. C- General and Transferable Skills: 1. Develop the student's ability to perform the duties and deliver them on time. 2. Logical and engineering thinking to find solutions and accounts for different mechanical systems and parts. 3. Develop the student's ability in dialogue and discussion. 4. Develop the student's ability to deal with modern technology, especially the Internet.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **<u>Part I – Mechanics of Materials</u>** **Simple Stress and Strain:** Types of Loads, Mechanical Properties, Stress and Strain, Direct or normal stress and Strain, Stress – Strain Curve, Poisson's Ratio, Shear stress and Strain Compound Bars. [6 hrs] **Shear Force and Bending Moment Diagrams:** Types of Loading, Types of Support, Definition and Sign Convention of Shearing Force and Bending Moment, Shearing Force and Bending Moment for Different Cases, Relationship Between Shear Force (Q),

	Bending Moment (M) and Intensity of Loading (W). [12 hrs] **Bending Stress of Beam:** Simple Theory of Bending, Neutral Axis and Section Modulus, Combined Bending and Direct Stress Eccentric loading. [6 hrs] **Shear Stress Distribution:** Distribution of shear stress due to bending, Applications on the Different Sections. [6 hrs] **Slope and Deflection of Beams:** Direct integration method (Double Integration), Macaulay's method, Mohr's "Area-Moment" Method, Continuous Beams-Clapeyron's "Three-Moment" Equation, Built in Beam (Fixed-Fixed). [12 hrs] **<u>Part II – Strength of Materials</u>** **Torsion:** Simple torsion theory, Polar Second Moment of Area and Polar Section Modulus Composite Shafts, Combined Stress Systems, Combined Bending and Torsion, Combined Bending, Torsion and Direct Thrust, Shafts with Bolt Coupling, Torsion of Non-Circular. [6 hrs] **Stress and Strain Analysis:** Stress Analysis, Stresses on Oblique Planes, Direct Stress, Material Subjected to Pure Shear, Material Subjected to Two Mutually Perpendicular Direct Stresses, Material subjected to combined direct and shear stresses, Principal plane inclination in terms of the associated principal stress, Graphical solution-Mohr's stress circle Strain Analysis, Linear strain for bi-and tri-axial stress state, Principal strains in terms of stresses, Bulk modulus K and Volumetric strain, Relationship between the elastic constants E, G, K and v, Strains on an oblique plane (direct and shear), Principal strain-Mohr's strain circle, Relationship between Mohr's stress and strain circles. [18 hrs] **Strain Energy:** Strain energy for different kind of loading, Suddenly applied loads, Castigliano's first theorem for deflection. [6 hrs] **Thin Cylinders and Shells:** Thin cylinders under internal pressure, Hoop or circumferential stress, Longitudinal stress, Changes in dimensions, Thin spherical shell under internal pressure, Change in internal volume, Vessels subjected to fluid pressure, Cylindrical vessel with hemispherical ends, Wire-wound thin cylinders. [6 hrs] **Thick Cylinders:** Development of the Lam6 theory, Thick cylinder - internal pressure only, Longitudinal stress, Change of cylinder dimensions, Compound cylinders. [6 hrs] **Struts:** Euler's theory, Euler "validity limit", Rankine or Rankine-Gordon formula. [6 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation and acquire skills dealing with engineering problems and topics related to mechanical design. In addition to developing the student's ability in dialogue and discussion and logical and engineering thinking to find solutions and accounts for different mechanical systems and parts. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ 15 اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	137	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	9.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.86
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	225		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10 % (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10 % (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10 % (10)	Continuous	All
	Report	1	10 % (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10 % (10)	7	LO # 1-7
	Final Exam	2hr	50 % (50)	16	All
Total assessment			100 % (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Simple Stress and Strain**: Types of Loads, Mechanical Properties, Stress and Strain, Direct or normal stress and Strain, Stress – Strain Curve, Poisson's Ratio, Shear stress and Strain Compound Bars.
Week 2	**Shear Force and Bending Moment Diagrams:** Types of Loading, Types of Support, Definition and Sign Convention of Shearing Force and Bending Moment, Shearing Force and Bending Moment for Different Cases, Relationship Between Shear Force (Q), Bending Moment (M) and Intensity of Loading (W).
Week 3	
Week 4	**Bending Stress of Beam:** Simple Theory of Bending, Neutral Axis and Section Modulus, Combined Bending and Direct Stress Eccentric loading.
Week 5	**Shear Stress Distribution:** Distribution of shear stress due to bending, Applications on the Different Sections.
Week 6	**Slope and Deflection of Beams:** Direct integration method (Double Integration), Macaulay's method, Mohr's "Area-Moment" Method, Continuous Beams-Clapeyron's "Three-Moment" Equation, Built in Beam (Fixed-Fixed).
Week 7	
Week 8	**Torsion:** Simple torsion theory, Polar Second Moment of Area and Polar Section Modulus Composite Shafts, Combined Stress Systems, Combined Bending and Torsion, Combined Bending, Torsion and Direct Thrust, Shafts with Bolt Coupling, Torsion of Non-Circular.
Week 9	**Stress and Strain Analysis:** Stress Analysis, Stresses on Oblique Planes, Direct Stress, Material Subjected to Pure Shear, Material Subjected to Two Mutually Perpendicular Direct Stresses, Material subjected to combined direct and shear stresses, Principal plane inclination in terms of the associated principal stress, Graphical solution-Mohr's stress circle Strain Analysis, Linear strain for bi-and tri-axial stress state, Principal strains in terms of stresses, Bulk modulus K and Volumetric strain, Relationship between the elastic constants E, G, K and v, Strains on an oblique plane (direct and shear), Principal strain-Mohr's strain circle, Relationship between Mohr's stress and strain circles.
Week 10	
Week 11	
Week 12	**Strain Energy:** Strain energy for different kind of loading, Suddenly applied loads, Castigliano's first theorem for deflection.
Week 13	**Thin Cylinders and Shells:** Thin cylinders under internal pressure, Hoop or circumferential stress, Longitudinal stress, Changes in dimensions, Thin spherical shell under internal pressure, Change in internal volume, Vessels subjected to fluid pressure, Cylindrical vessel with hemispherical ends, Wire-wound thin cylinders.
Week 14	**Thick Cylinders:** Development of the Lam6 theory, Thick cylinder - internal pressure only, Longitudinal stress, Change of cylinder dimensions, Compound cylinders.
Week 15	**Struts:** Euler's theory, Euler "validity limit", Rankine or Rankine-Gordon formula.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Lab 1:** Impact Test
Week 2	**Lab 2:** Tensile Test
Week 3	**Lab 3:** Bending Test
Week 4	**Lab 4:** Torsion Test
Week 5	**Lab 5:** Curved Beam Test
Week 6	**Lab 6:** Thin Cylinder Test
Week 7	**Lab 7:** Buckling Test

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Mechanics of Materials I - E. J. Hearn	Yes
Recommended Texts	Strength of Materials - Ferdinand L. Singer and Andrew Pytel	Yes
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering www.mathalino.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
	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	**Computer II**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOB203**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level		2	**Semester of Delivery**		3
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	RANA LATEEF		**e-mail**	rana.natush@uobasrah.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.S.C
Module Tutor	RANA LATEEF NATOOSH		**e-mail**	rana.natush@uobasrah.edu.iq	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	The theoretical foundations of computer engineering have expanded substantially in recent years. The objective of this course is to introduce students to this fundamental area of computer science which enables students to focus on the study of programming languages. These languages allow the students to assess what could be achieved through computing when they are using it to solve problems in science and engineering. The course exposes students to the programming with MATLAB, as well as to its usage for problem solving. The course introduces basic programming instructions and their properties, and the necessary mathematical libraries to develop different software applications. Upon completion of this course the students are expected to become proficient in key topics of MATLAB language programming the opportunity to explore the current topics in this area
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Clarify the basic concepts of programming in MATLAB language through a set of programming instructions. 2. Gain skills in handling programming problems and issues. 3. Acquiring basic skills as an introduction to building large and applied programs. 4. Gain a basic understanding of how programmed systems work in various industrial applications. 5.Ability to program and design application programs. 6. The ability to think about addressing a particular problem or issue. 7. Writing scientific reports. 8.The ability to gain experience in dealing with programmed systems..
Indicative Contents المحتويات الإرشادية	1. Readings, self-learning, panel discussions. 2. Exercises and activities in the lecture. 3. Homework. 4. Directing students to some websites to benefit and develop capabilities. 5. Conducting seminars to explain and analyze a specific issue and find solutions to it.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Explanation and clarification through lectures. 2. The method of displaying scientific materials on display devices: data show, smart boards, and plasma screens. 3. Self-learning through homework and mini-projects within the lectures.

	4. Laboratories. 5. Graduation projects. 6. Scientific visits. 7. Seminars held in the department. 8. Summer training

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	13	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.86
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Matlab language and writing symbols with use it
Week 2	Types of constants , variables and arithmetic sentences
Week 3	Write a simple matrix and how to address it to find any element in it
Week 4	Write a regular matrices and how to address it to find any element in it
Week 5	Standard matrices unit, zeroes and eye matrices
Week 6	operations on arrays
Week 7	Arithmetic operations between a matrix and a singular number or between matrices
Week 8	Searching for a partial matrix and using prompts to find the sum of the elements of the matrix or the largest or smallest element in it
Week 9	Input and output sentences
Week 10	Comparative and logical operators If-else-end form switch-case-otherwise form
Week 11	Rotation and repetition statements
Week 12	Formula for storing variables and for loading them from a file
Week 13	Dealing with files
Week 14	Instructing plot and partial graphs
Week 15	Greate function that deal with one or with several variables with input and one variable with output
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Steps to create, compile and implement a program using Matlab languge
Week2	Lab 2: Implement programs for Array (one and two dimensions)
Week 3	Lab 3: Implement programs for conditional statements (if-statement)
Week 4	Lab 4: Implement programs for conditional statements (switch-statement)
Week 5	Lab 5: Implement programs for Loop statements (for-statement)
Week 6	Lab 6: Implement programs for plot and partial graphs
Week 7	Lab 7: Implement programs for function that deal with one or with several variables

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		
Recommended Texts	تعليم البرمجة بلغة ماتلاب بالأمثلة الشاملة	No
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	**Crimes of Baath Party**			**Module Delivery**	
Module Type	**Basic**			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOB205**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		2	**Semester of Delivery**		3
Administering Department		Depart. of Mech. Eng.	**College**	College of Engineering	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Zanab		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**		2.0

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 Aims أهداف المادة الدراسية	1. To provide an understanding of the fundamental concepts and principles of freedom and human rights. 2. To explore the different aspects of freedom, including intellectual, cultural, political, economic, and social freedoms. 3. To examine the relationship between human rights, democracy, and the Universal Declaration of Human Rights. 4. To analyze the various types of democracy and their applications. 5. To address the challenges and future prospects of public freedoms and democracy.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamental concepts and principles of freedom and human rights. 2. Analyze the different dimensions of freedom, including intellectual, cultural, political, economic, and social freedoms. 3. Evaluate the significance of the Universal Declaration of Human Rights in promoting human rights globally. 4. Examine the intersection of freedom and democracy, including the concept of democracy in Islam. 5. Compare and contrast different types of democracy and their practical applications. Critically analyze the challenges and opportunities related to public freedoms and democracy.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Introduction to Human Rights and Democracy: Overview of the course objectives and structure, Introduction to fundamental concepts of freedom and human rights, Fundamental Freedoms: Intellectual freedom and cultural freedom, Freedom in Politics: Political freedom, Overview of different political systems and their impact on human rights (6hrs) • Economic and Social Freedom: Economic freedom, Social freedom, The Future of Public Freedoms: Emerging challenges and opportunities in the context of public freedoms, Universal Declaration of Human Rights and Freedoms: Overview of the Universal Declaration of Human Rights and its significance, Freedom in Islam: Examination of the concept of freedom in Islamic teachings (6hrs) • Types of Democracy: Introduction to different types of democracy, Democracy and its Application: Analysis of the practical implementation of democracy in various contexts, Administrative and Financial Corruption: Examination of the impact of corruption on human rights and democracy, Democracy in Islam: Exploration of the concept of democracy within Islamic

	principles (8 hrs) • Challenges to Democracy: Analysis of the challenges faced by democratic systems, Protection of Human Rights:, Strategies and mechanisms for the protection of human rights, Democratic Governance: Understanding the principles and practices of democratic governance, Conclusion and Future Perspectives: Review of key concepts and discussions on the future prospects of human rights and democracy(8hrs)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Here are some suitable learning and teaching strategies for the course "Human Rights and Democracy": Lectures: Conduct engaging lectures to introduce and explain the fundamental concepts of freedom, human rights, and democracy. Use multimedia resources, case studies, and real-life examples to illustrate the practical applications and challenges related to human rights and democracy. Encourage student participation through interactive discussions, questions, and debates to promote critical thinking and deeper understanding of the topics. Group Discussions and Debates: Organize group discussions and debates to encourage students to critically analyze and evaluate different perspectives on human rights and democrcy

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Human Rights and Democracy: • Overview of the course objectives and structure • Introduction to fundamental concepts of freedom and human rights
Week 2	Fundamental Freedoms: • Intellectual freedom and cultural freedom
Week 3	Freedom in Politics: • Political freedom • Overview of different political systems and their impact on human rights
Week 4	Economic and Social Freedom: • Economic freedom • Social freedom
Week 5	The Future of Public Freedoms: • Emerging challenges and opportunities in the context of public freedoms

Week 6	Universal Declaration of Human Rights and Freedoms: • Overview of the Universal Declaration of Human Rights and its significance
Week 7	Freedom in Islam: • Examination of the concept of freedom in Islamic teachings
Week 8	Types of Democracy: • Introduction to different types of democracy
Week 9	Democracy and its Application: • Analysis of the practical implementation of democracy in various contexts
Week 10	Administrative and Financial Corruption: • Examination of the impact of corruption on human rights and democracy
Week 11	Democracy in Islam: • Exploration of the concept of democracy within Islamic principles
Week 12	Challenges to Democracy: • Analysis of the challenges faced by democratic systems
Week 13	Protection of Human Rights: • Strategies and mechanisms for the protection of human rights
Week 14	Democratic Governance: • Understanding the principles and practices of democratic governance
Week 15	Conclusion and Future Perspectives: • Review of key concepts and discussions on the prospects of human rights and democracy
Week 16	**Preparatory week before the final Exam**

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		
	Text	**Available in the Library?**
Required Texts	"Human Rights: Politics and Practice" by Michael Goodhart	No
Recommended Texts		
Websites	https://www.ohchr.org/en/ohchr_homepage	

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.

2MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Arabic Language II**			**Module Delivery**	
Module Type	**Basic**			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOB204**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		2	**Semester of Delivery**		3
Administering Department		Depart. of Mech. Eng.	**College**	College of Engineering	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. العمل على النهوض باللغة العربية والمحافظة عليها من الخطأ 2. معرفة الطالب جمالية الاسلوب القرأني واعجازه البلاغي ليكون النموذج الامثل في الصياغة والتعبير 3. تنمية مهارات الطالب الاملائية 4. مساعدة الطالب على معرفة الطريقة الصحيحة في كتابة الاعداد وقراءتها وكتابة الهمزة بانواعها 5. مراجعة قواعد اللغة العربية لتجنب وقوع الطالب في الخطأ النحوي 6. تنمية مهارات الطالب على تذوق جمال التعبير الادبي ومحاكاة النصوص الجميلة في الكتابة 7. مساعدة الطالب على تمييز الاغلاط اللغوية الشائعة وارشاده الى تصويبها 8. تنمية مهارة الحفظ والالقاء
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. حب الطالب للغة العربية والاعتزاز بها 2. اكتساب الطالب القدرة على فهم الاعجاز اللغوي في النصوص القرأنية والاحساس بجماليتها 3. معرفة الطالب طريقة التفريق بين انواع الهمزة الاولية والمتوسطة والمنتهية والقدرة على كتابتها بالشكل الصحيح دون الوقوع في الخطأ 4. قدرة الطالب على التفريق بين الظاء والضاد وعدم الوقوع في اشكالية الخلط بينهما 5. قدرة الطالب على الكتابة دون الوقوع في الخطأ الاملائي والنحوي 6. تمكن الطالب من قراءة النصوص الادبية بلغة فصحى صحيحة ومضبوطة بالحركات 7. القدرة على التعبير الادبي بلغة جميلة سليمة 8. تمكن الطالب من معرفة اكثر من خمسين خطأ شائعاً ومعرفة تصويبها
Indicative Contents المحتويات الإرشادية	**1.**مقدمة • أهمية تعلم اللغة العربية. • التعريف بأهداف المادة ودورها في تنمية مهارات التواصل. **2.**المحتويات الأساسية أ .الحروف والأصوات • التعرف على الحروف الهجائية (28 حرفًا). • تمارين نطق الحروف. • أنشطة للتفرقة بين الأصوات المتشابهة. ب .المفردات الأساسية • كلمات تتعلق بالأسرة (أفراد العائلة). • أسماء الأشياء اليومية (الألوان، الأشكال، الأعداد). • أفعال بسيطة تعبر عن الأنشطة اليومية. ج .القراءة والكتابة • قراءة نصوص بسيطة (قصص قصيرة، أبيات شعرية). • تمارين كتابة الحروف والكلمات. • أنشطة ربط الصور بالكلمات المكتوبة.

	د .الاستماع والتحدث • أنشطة استماع لمواقف حياتية (مثل: التسوق، المدرسة). • تمارين محادثة (تعريف النفس، الحديث عن الهوايات). • استخدام الألعاب والدراما لتعزيز مهارات التحدث. **3.**استراتيجيات التدريس • التعلم من خلال اللعب (ألعاب لغوية وتفاعلية). • استخدام الوسائط المتعددة (فيديوهات، مقاطع صوتية). • العمل الجماعي والفردي لتشجيع التفاعل. **4.**التقييم والمتابعة • تقويم مستمر من خلال الملاحظات اليومية. • امتحانات قصيرة في نهاية كل وحدة. • مشاريع بسيطة تعكس ما تم تعلمه. **5.**الأنشطة المكملة • زيارات ميدانية (مكتبة، متحف). • ورش عمل فنية (كتابة القصص، رسم الشخصيات). • حفلات قراءة للطلاب لتعزيز الثقة بالنفس. **6.**الوسائل التعليمية • بطاقات تعليمية. • قصص مصورة. • مواد سمعية بصرية تدعم التعلم. ملاحظات ختامية • يشدد على أهمية المشاركة الفعالة للطلاب في العملية التعليمية. • ينبغي للمعلمين تعديل الأنشطة وفقاً لاحتياجات الطلاب ومستوياتهم. هذا المحتوى الإرشادي يهدف إلى توفير توجيهات واضحة لمعلمي اللغة العربية في المستوى الأول، ويعزز من تجربة التعلم لدى الطلاب

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**1.**التعلم النشط • **التعلم من خلال اللعب :**استخدام الألعاب التعليمية لتشجيع الطلاب على المشاركة والتفاعل مع المحتوى.

- **المشاريـع الجماعية :**تنظيم أنشطة جماعية مثل كتابة قصة قصيرة أو تمثيل مشهد درامي.

2.التعلم بالاستكشاف

- **التعلم القائم على الاستفسار :**تشجيع الطلاب على طرح الأسئلة والبحث عن الإجابات من خلال الأنشطة الموجهة.
- **استكشاف البيئة :**القيام بزيارات ميدانية لمواقع قريبة لتعزيز فهم المفردات المتعلقة بالبيئة المحيطة.

3.التعلم التعاوني

- **المجموعات الصغيرة :**تقسيم الطلاب إلى مجموعات صغيرة للعمل على مهام معينة، مما يعزز التعاون والتفاعل.
- **التبادل اللغوي :**تشجيع الطلاب على التحدث مع بعضهم البعض ومشاركة الأفكار والمفردات.

4.التقنيات الحديثة

- **استخدام الوسائط المتعددة :**توظيف الفيديوهات، والتطبيقات التعليمية، والألعاب الإلكترونية لتعزيز التعلم.
- **المحتوى الرقمي :**استخدام القصص الصوتية والمحتوى التعليمي الإلكتروني لتعزيز مهارات الاستماع والقراءة.

5.التعلم القائم على المشاريـع

- **مشاريـع فنية :**مثل رسم شخصيات من قصص تم قراءتها أو إنشاء ملصقات تعبر عن موضوعات معينة.
- **كتابة القصص :**يشجع الطلاب على كتابة قصص قصيرة باستخدام المفردات الجديدة.

6.التغذية الراجعة المستمرة

- **التقييم الذاتي :**تشجيع الطلاب على تقييم تقدمهم من خلال أوراق العمل والنشاطات.
- **التغذية الراجعة الفورية :**تقديم ملاحظات فورية للطلاب بعد الأنشطة لضمان الفهم الصحيح.

7.التفاعل الاجتماعي

- **المناقشات الصفية :**تنظيم مناقشات حول المواضيع التي تم تناولها لتعزيز مهارات التعبير الشفوي.
- **القصص المشتركة :**دعوة الطلاب لمشاركة تجاربهم الشخصية من خلال سرد القصص.

ملاحظات ختامية

- يجب أن تكون الأنشطة مرنة وقابلة للتكيف مع احتياجات ومستويات الطلاب.
- ينبغي أن تعزز استراتيجيات التعليم الشعور بالثقة والقدرة على التعبير لدى الطلاب.

تساعد هذه الاستراتيجيات في خلق بيئة تعليمية تفاعلية تعزز من مهارات اللغة العربية لدى الطلاب في المستوى الأول.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	درس بيان اهمية اللغة العربية بصورة عامة واهميتها لطلاب غير التخصص
Week 2	اقسام الكلام والمعرب والمبني من الاسماء والافعال

Week 3	المثنى والملحق به
Week 4	انواع الجموع وما يلحق به
Week 5	الاسماء الخمسة
Week 6	كتابة الاعداد
Week 7	الهمزة الاولية – همزتا القطع والوصل
Week 8	الهمزة المتوسطة والمنتهية
Week 9	الاعجاز اللغوي في القران الكريم نماذج وتطبيقات
Week 10	الاسماء الخمسة
Week 11	الافعال الخمسة
Week 12	الاغلاط اللغوية الشائعة
Week 13	كتابة الظاء والضاد والتاء المربوطة والهاء
Week 14	درس التعبير ونماذج من اساليب اشهر الكتاب الادبية
Week 15	قصيدة لشاعر قديم ولشاعر حديث
Week 16	التحضير للامتحان النهائي

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		
	Text	**Available in the Library?**
Required Texts	النحو الواضح/ علي حازم لمسات بيانية/ فاضل السامرائي منهج اللغة العربية للاقسام غير الاختصاص	لا
Recommended Texts	معجم الاخطاء اللغوية والنحوية الشائعة/ خضر ابو العينين معاني النحو/ فاضل السامرائي الاعمال الشعرية الكاملة/ نازك الملائكة/ المعلقات	لا
Websites	https://ketabpedia.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
	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 Information
معلومات المادة الدراسية

Module Title	**Engineering Mathematics II**	**Module Delivery**	
Module Type	**Support**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM221**		
ECTS Credits	4		
SWL (hr/sem)	**100**		
Module Level	2	**Semester of Delivery**	4
Administering Department		**College**	
Module Leader	Yahya Muhammed Ameen	**e-mail**	yahya.ameen@uobasrah.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	01/10/2024	**Version Number**	2.0

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 Aims أهداف المادة الدراسية	In this course the student teaches different methods (including Laplace transformation) to solve ordinary deferential equations. The fundamentals of series and sequences also will be provided.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Knowledge and Understanding: By the end of the course the student will be able to: A1. Use different mathematical methods to solve ordinary differential equations (and then many engineering problems). B. Subject-specific skills: The ability to solve engineering problems and how to deal with them mathematically and choosing the appropriate methods for solving.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Unit I : DIFFERENTIAL EQUATIONS (i) First-Order DEs: Fundamental definitions. Solutions of First-Order DEs. Separation of variables. Exact, linear, and Bernoulli equations. (ii) Second and higher Order DEs: D-operator. Linear equation with constant coefficients. Linear homogeneous equations with constant coefficients. Non-homogenous equations. Solving of non-homogenous equations: Undetermined coefficients and variation of parameters methods. Higher-order linear equations with constant coefficients, Cauchy equation. [28 hrs.] Unit II: LAPLACE TRANSFORMATION Definition and basic properties of the Laplace Transformation. The Laplace Transformation of elementary functions. The Laplace Transform of e^{at} f (t), and $t^n f(t)$. Inverse Laplace transforms. Solution of differential equations using Laplace Transforms. [20 hrs.] Unit III: INFINITE SEQUENCES AND SERIES Introduction. Convergence and Divergence Tests. Geometric series and partial sum. Integral. Comparison, ratio and root tests. Alternating series. Power Series. Taylor and Maclaurin series. Applications of power series. [12 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and some activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	38	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.53
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hrs.	10% (10)	7	LO # 1-7
	Final Exam	2hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Fundamental Definitions. Solution of a Differential Equation (DE). Solutions of The First-Order DEs: 1- Separation of Variable in First-Order DEs.
Week 2	2- Homogeneous First-Order DEs. 3- Exact First-Order DEs and Integrating Factors.
Week 3	4- Linear DEs and Bernoulli Equation.
Week 4	Solutions of The Second-Order DEs: 1- Second-Order Differential Equations Reducible to First-Order.
Week 5	2- Second-Order Homogeneous Linear DEs. 3- Second-Order Nonhomogeneous Linear DEs.
Week 6	Particular Solution Methods: 1- Undetermined Coefficients. 2- Variations of Parameters.
Week 7	Solutions of The Higher-Order DEs: 1- Higher-Order Homogeneous Linear DEs. 2- Higher-Order Nonhomogeneous Linear DEs.
Week 8	Definition and basic properties of the Laplace Transformation.
Week 9	The Laplace Transformation of elementary functions. The Laplace Transform of $e^{at} f(t)$.

Week 10	The Laplace Transform of $t^n f(t)$. Inverse Laplace transforms. Properties of inverse Laplace Transform.
Week 11	Inverse Laplace Transforms using partial fractions.
Week 12	Solution of DEs using Laplace Transforms.
Week 13	Introduction to sequences. Convergence and divergence.
Week 14	Infinite series. Converges and diverges tests of infinite series.
Week 15	Power series. Taylor and Maclaurin series.
Week 16	Preparatory week before the final Exam.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Advanced Engineering Mathematics, Dennis G. Zill, Loyola Marymount University. Sixth edition.	No
Recommended Texts	Thomas' Calculus, Maurice D. Weir, Joel Hass, George B. Thomas.-12th ed.	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Thermodynamics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM222**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	BEM		**College**	BEM	
Module Leader	Mohammed K Kadhim		**e-mail**	E-mail mohameed.kado@uobasrah.edu.iq	
Module Leader's Acad. Title	Asst Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/10/2024		**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	In this Module, the study of thermodynamics concepts, principles and analysis techniques is made relatively easy for the reader by inclusion of most of the reference data, in form of excerpts, within the discussion of each case study, exercise and self-assessment problem solutions. This is in an effort to facilitate quick study and comprehension of the material without repetitive search for reference data in other.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Better understanding of thermodynamics terms, concepts, principles, laws, analysis methods, solution strategies and computational techniques. 2. Greater confidence in interactions with thermodynamics design engineers and thermodynamics experts. Summarize what is meant by the Thermodynamics. 3. Skills and preparation necessary for succeeding in thermodynamics portion of various certification and licensure exams, i.e. CEM, FE, PE, and many other trade certification tests. Describe power, heat, and vapor. 4. A better understanding of the thermodynamics component of heat related energy projects. 5. A compact and simplified thermodynamics desk reference.
Indicative Contents المحتويات الإرشادية	Content includes the following. <u>Part A</u> Phases of Water and Associated Thermodynamics [10 hrs] Thermodynamics I [12 hrs] THE WORKING FLUID. [10 hrs] Reversible Processes (Non-Flow & Steady Flow). [10 hrs] THERMODYNAMIC II [12 hrs] Revision problem classes [5 hrs] <u>Part B -</u> The heat engine Cycles. [12 hrs] The Simple Rankin Cycle. [8 hrs] Positive Displacement Compressors Reciprocating Machines The Conditions For Minimum Work Isothermal Efficiency & Volumetric Efficiency

	Multi – Stage Compression. [12 hrs] Mixtures Dalton's Law and Gibbs – Dalton Law Volumetric Analysis of a Gas Mixture Molecular Weight Gas Constant and Specific Heat of Gas Mixture Adiabatic Mixing of Gas Mixture[10 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Certain thermodynamic concepts and terms explain more than once as these concepts appear in different segments of this text; often with a slightly different perspective. This approach is a deliberate attempt to make the study of some of the more abstract thermodynamics topics more fluid; allowing the reader continuity, and precluding the need for pausing and referring to segments where those specific topics were first introduced.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	122	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	4, 10	LO #1, 2, and 3
	Tutorials	2	10% (10)	2, 12	LO # 3, 4, 5 and 6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 7, 8 and 9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-11
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	BASIC CONCEPTS OF THERMODYNAMICS
Week 2	PROPERTIES OF PURE SUBSTANCES
Week 3	FIRST LAW OF THERMODYNAMICS
Week 4	IDEAL AND REAL GASES
Week 5	Application of First Law to Steady Flow Process
Week 6	AVAILABILITY AND IRREVERSIBILITY
Week 7	SECOND LAW OF THERMODYNAMICS AND ENTROPY
Week 8	Limitations of First Law of Thermodynamics and Introduction to Second Law
Week 9	Performance of Heat Engines and Reversed Heat Engines 5.3. Reversible Processes Statements of Second Law of Thermodynamics
Week 10	GAS POWER CYCLES
Week 11	REFRIGERATION CYCLES
Week 12	Mid-term Exam
Week 13	VAPOUR POWER CYCLES
Week 14	Limitations of First Law of Thermodynamics and Introduction to Second Law
Week 15	GASES AND VAPOUR MIXTURES
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1:calibration of gas pressure gauge
Week 2	Lab 2: calibration of temperature gauge
Week 3	Lab 3: study of Carnot cycle
Week 4	Lab 4: study of compressor cycle
Week 5	Lab 5: study of heat engine cycle
Week 6	Lab 6: ranking cycle
Week 7	Lab 7: gas turbine cycle

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals Of Mechanical Engineering Thermodynamics true Theory Of Machines And Strength Of Materials 2Nd Ed. (G. S. Sawhney) (z-lib.org)	yes
Recommended Texts	ENGINEERING THERMODYNAMIC T HIRD EDITION SI Units Version R. K. Rajput	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/mechanical-engineering	

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	**Engineering Metallurgy**			**Module Delivery**	
Module Type	**Core learning activity**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM223**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr. Haider Mahdi Lieth		**e-mail**	haider.lieth@uobasrah.edu.iq	
Module Leader's Acad. Title	Assistant Prof.		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Dr. Haider Mahdi Lieth		**e-mail**	haider.lieth@uobasrah.edu.iq	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/10/2024		**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. The objective of the course is to provide the background necessary to make informed decisions and recommendations concerning the suitability of metals and alloys for engineering applications. It explores the way in which alloys are used and the way in which production and fabrication routes influence their fitness for purpose. 2. The first segment of the course considers the principal properties of engineering alloys that are of major importance for the practicing mechanical engineer, namely properties such as strength, toughness, stiffness, and ductility. 3. To help in understanding the chemical make-up and different macroscopic and microscopic structure. 4. To understand process of extraction, refining and production of different metals, ferrous and non-ferrous alloys. 5. The microstructure of a metal, the structural features that are control to observation under a microscope. 6. Microstructure determines mechanical properties of the metal, including their elastic and plastic behavior when applying the force. 7. Chemical composition is the relative content of a particular element within an alloy, usually expressed as a percent weight. Metals and their alloys are widely used in our daily live
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Clarify the engineering materials classifications and their divisions. 2. Identify ferrous materials and their properties 3. Identifying non-ferrous materials and their classifications and addressing their properties 4.Understand the structures, properties and applications of metals, 5. Understand causes of environmental pollution due to processing of engineering materials and environmental cost of corrosion of materials and propose their control. 6. Apply the acquired knowledge to make appropriate materials selection for engineering applications.
Indicative Contents المحتويات الإرشادية	• Readings, self-learning, panel discussions. • Exercises and activities in the lecture. • Homework. • Directing students to some websites to benefit and develop capabilities. • Conducting seminars to explain and analyze a specific issue and find solutions to it.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures for explanation and clarification. 2. The exhibition of scientific materials using display technologies such as data projectors, smart boards, and plasma panels. 3. Self-study via homework and mini-projects inside lectures. 4. Laboratories. 5. Projects for graduation. 5.Visits to scientific institutions. 6.Seminars are held in the department.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	107	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.53
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	4, 10	LO #1, 2, and 3
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 5 and 6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 7, 8 and 9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-11
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	classifications of materials, Mechanical properties, The Periodic Table
Week 2	CRYSTALSTRUCTURES , Points, Directions, and Planes in the Unit Cell, Imperfections in the Atomic Arrangements, Dislocations
Week 3	Solidification, Cooling Curves, Nucleation, Equilibrium Diagrams
Week 4	Thermal Equilibrium diagrams, Substitution solid solution, Interstitial solid solution, BINARY ISOMORPHOUS SYSTEMS
Week 5	Ferrous materials, The Iron-Carbon Phase Diagram, Properties and application of plain steel carbon
Week 6	Heat Treatment of Steel, Types of Heat Treatment Processes, Annealing
Week 7	Normalizing, Hardening, Tempering, Nitriding, Carburising, Case hardening or surface hardening
Week 8	Alloy Steel, Manganese Steel, stainless steel
Week 9	Austenitic steels, ferritic steels, Martensitic steels, Duplex stainless steels, Precipitation-hardening stainless steel, Tool steel
Week 10	Mechanical properties, Tension Tests, Compression Tests, Shear and Torsional Tests, STRESS–STRAIN BEHAVIOR
Week 11	Plastic Deformation, TRUE STRESS AND STRAIN, Hardness, Relationship between hardness and the flow curve
Week 12	Cast Irons, Types of Cast Iron, Grey cast iron, White cast iron, Nodular cast iron
Week 13	Malleable cast iron, Compacted Graphite Iron, Alloy cast iron
Week 14	non-ferrous metals, classification of non-ferrous metals, Light metals: Aluminum, Magnesium, Titanium, Beryllium
Week 15	Heavy metals: Copper, Zinc, Lead, Tin, Refractory metals: Tungsten, Nickel, Molybdenum, Chromium, Precious metals: Gold, Silver, Platinum
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Preparation of Metallographic Specimens
Week 2	Lab 2: Hardness Tests
Week 3	Lab 3: Impact Test

Week 4	Lab 4: Creep Test
Week 5	Lab 5: Heat Treatment for Ferrous Alloys

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1-Materials Science and Engineering: An Introduction, 10th Edition, William D. Callister Jr., January 2018. 2-Selection and Use of Engineering Materials by J. A. Charles, F. A. A. Crane, and J. A. G. Furness, Third Edition 2001. 3-The Science and Engineering of Materials by D. R. Askeland, and P. Phule Fourth Edition 2003.	Yes
Recommended Texts	Concepts of Materials Science, By Adrian P. Sutton · 2021	No
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	**Mechanical Drawing**	**Module Delivery**	
Module Type	Core	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM224**		
ECTS Credits	**4**		
SWL (hr/sem)	**100**		

Module Level	2	**Semester of Delivery**	4
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Dr. Asmaa Aassy Kawy	**e-mail**	Asmaa.kawy@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	Dr. Asmaa Aassy Kawy	**e-mail**	Asmaa.Kawy@uobasrah.edu.iq
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/10/2024	**Version Number**	2.0

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 Aims أهداف المادة الدراسية	1- Understand the importance of mechanical drawing for the engineer and its applications 2- Recognizing the basics of representing the various mechanical parts in engineering drawing and the student's awareness of mechanical drawing as one of the scientific bases for working in the implementation of mechanical works. 3- Teaching the student the important role of drawing in achieving solutions to technical problems in designing machines, machines, devices, tools, and implementing and manufacturing mechanical parts. 4- Teaching the student the principles of assembling and dismantling mechanical systems, methods of connecting parts, the foundations of welding, and how to write their symbols 5- The student learned how to write and read mechanical drawing boards in general.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Knowledge and Understanding A1. Acquisition of skills in drawing mechanical parts and knowledge of engineering symbols and terms and standard specifications in engineering and mechanical drawing with the necessary skill to read and write industrial drawings. A2- Acquiring basic skills as an introduction to design programs such as AutoCAD and other programs that are applied in practical applications. A3- Gain a basic understanding of how to draw simple and complex assembled mechanical parts in practical life A4- Informing the student of the role of engineering drawing and its relationship to the production of various industrial products and drawing them in all their fine details. B. Subject-specific skills B1. The student acquires the skill to read and understand the schematics of mechanical parts and systems resulting from their assembly B 2- Representation of the individual mechanical parts and the resulting systems from their assembly by mechanical drawing . B 3- Acquiring the skill of connecting mechanical parts and the foundations of assembling and dismantling mechanical systems. B4- Read and represent all the minute details of the surfaces and properties of metals and the methods of connecting mechanical systems.
Indicative Contents المحتويات الإرشادية	A- Knowledge and Understanding A1. Acquisition of skills in drawing mechanical parts and knowledge of engineering symbols and terms and standard specifications in engineering and mechanical drawing with the necessary skill to read and write industrial drawings. A2- Acquiring basic skills as an introduction to design programs such as AutoCAD and other programs that are applied in practical applications. A3- Gain a basic understanding of how to draw simple and complex assembled mechanical parts in practical life A4- Informing the student of the role of engineering drawing and its relationship to

	the production of various industrial products and drawing them in all their fine details. B. Subject-specific skills B1. The student acquires the skill to read and understand the schematics of mechanical parts and systems resulting from their assembly B 2- Representation of the individual mechanical parts and the resulting systems from their assembly by mechanical drawing . B 3- Acquiring the skill of connecting mechanical parts and the foundations of assembling and dismantling mechanical systems. B4- Read and represent all the minute details of the surfaces and properties of metals and the methods of connecting mechanical systems.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- The lectures and their inclusion of various methods such as pictures, drawings and models as means of clarification to explain and draw topics in detail. 2- Asking questions and inquiries that are distinguished by depth and accuracy. 3- Directing the student towards the many practical questions of the subject. 4- Develop the digital sense of expression. 5- Brainstorming.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	38	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.53
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	4, 10	LO #1, 2, and 3
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 5 and 6
	Projects / pr	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 7, 8 and 9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-11
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	A review of drawing lines and projections in the first and third projection angles and free drawing + Screw threads
Week 2	Screw fastening and nuts + Rivets and rivets joints
Week 3	Keys, cotter- joints and pin joints + Shaft coupling
Week 4	Welded joints + Detail drawing (part drawing)
Week 5	Engen parts/ pistons + stuffing box & crossheads
Week 6	Cranks and Connecting rod + Eccentric
Week 7	Assembly drawing + Shaft Bearings
Week 8	Pulleys
Week 9	Welded joints
Week 10	Spur Gears
Week 11	Fits, limits and Tolerance
Week 12	Surface finishing
Week 13	Valves
Week 14	Drawing analysis
Week 15	Drawing analysis
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1-Mechanical Drawing /Shri N.D Bhat	Yes
Recommended Texts	2-Mechanical Drawing / K.L. Narayana	No
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	**Electrical Machines**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM225**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Ali Kadhim Abdulabbas		**e-mail**	ali.abdulabbas@uobasrah.edu.iq	
Module Leader's Acad. Title	Ass. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/10/2024		**Version Number**	2.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Electrical Engineering	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Identifying the machine's (continuous and alternating) installation and derivation of the E.M.F equation and the equivalent circuit of the motors 2. Identify the types of generators and their features. 3. Identify the types of motors and their features. 4. Learn about the applications of generators and motors. 5. Identify electrical transformers and derive the E.M.F equation. and its equivalent circuit. 6. Learn how synchronous machines work and features 7. Learn how semiconductors work 8. Learn how to measure electrical and non-electrical quantities.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learn how DC and AC generators work and their features. 2. Learn how DC and AC motors work and the features 3. Explain the basic principles of the work of generators and synchronous motors and link them to practical applications. 4. Explain the basic principles of semiconductor work 5. Explanation of the basic principles of the work of relays and circuit breakers 6. Explanation of the basic principles of the mechanism of measuring electrical and non-electrical quantities 7. Allocating lectures to solve theoretical issues and discuss basic concepts. 8. Directing students to each other to benefit from systematic training for the third stage.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – D.C.machine theory and induction motor</u> DC machine construction– E.M.F. Equation and output equation and commutation, Types of dc generators DC Motor types Dc generators characteristics, Starting of dc motors Speed control, Principle of action E.M.F. equation, leakage reactions [15 hrs] equivalent circuit, voltage regulation and efficiency, open circuit ,and short circuit tests. Production of rotating magnetic field –[15 hrs] induction motor - Production of rotating magnetic field,synchronous speed and slip, equivalent circuit – torque / speed curve, – starting of cage and slip – ring induction motors , speed control and reversal of direction. . [10 hrs] Revision problem classes [21 hrs]

	Part B – Synchronous machine and power system E.M.F. equation – armature reaction, synchronous impedance voltage regulation – synchronization, Synchronous motor– principle of operation, starting methods V. curves application of synchronous motors. [15 hrs] Semiconductor diodes – Rectifiers, Different types of Bridge circuits, Transistors – Power Amplifiers measurement of non – electrical parameters pressure, velocity, flow, temperature, etc [7 hrs] SCRs and their applications., Means of industrial power supply – Factory layouts for distribution and sub. – stations – protection schemes – relays and circuit breakers, power factor corrections., [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - DC machine construction Magnetic Circuit
Week 2	E.M.F. Equation and output equation and commutation-Types of dc generators DC Motor types Dc generators characteristics
Week 3	Test of dc generators DC motor characteristic-Starting of dc motors Speed control.
Week 4	Principle of action E.M.F. equation- leakage reactions
Week 5	equivalent circuit-voltage regulation and efficiency
Week 6	open circuit and short circuit tests- Production of rotating magnetic field
Week 7	synchronous speed and slip-equivalent circuit – torque / speed curve
Week 8	starting of cage and slip – ring induction motors- speed control and reversal of direction.
Week 9	E.M.F. equation – armature reaction- synchronous impedance voltage regulation – synchronization.
Week 10	starting methods, V curves application of synchronous motors- Semiconductor diodes – Rectifiers
Week 11	Different types of Bridge circuits- Transistors – Power Amplifiers-
Week 12	SCRs and their applications. Means of industrial power supply – Factory layouts for distribution and sub.
Week 13	stations – protection schemes – relays and circuit breakers-Illumination and heating designs

Week 14	power factor corrections- Measurement of current, voltage and power – recording of energy consumption
Week 15	voltage divider extension of instrument range
Week 16	**A preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to D.C machine
Week 2	Lab 2: Magnetization curve
Week 3	Lab 3: the test of separately-excited D.C. machine.
Week 4	Lab 4: the test of shunt-excited D.C. machine.
Week 5	Lab 5: Test of open and short of induction machine
Week 6	Lab 6: Test of synchronous machine.
Week 7	Lab 7: Transmission line.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Edward Hughes - Hughes electrical and electronic technology [electronic resource]-Pearson Education (2012).pdf	Yes
Recommended Texts	Electrical technology by Hindmarch	yes
Recommended Texts	Electrical Technology by Theraja	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-machines.	

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	**English Language II**	**Module Delivery**	
Module Type	**Basic**	☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOB202**		
ECTS Credits	**2**		
SWL (hr/sem)	**50**		
Module Level	2	**Semester of Delivery**	4
Administering Department	Type Dept. Code	**College**	Type College Code
Module Leader	Ameen Ahmed Nassar	**e-mail**	Ameen.nassar@uobasrah.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/10/2024	**Version Number**	2.0

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 Aims أهداف المادة الدراسية	1. To develop understanding of English Language 2. To understand Grammar of the English Language 3. This course deals with the basic concept of English Language.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how Grammar of English Language work. 2. List the various terms associated with English Language. 3. Summarize what is meant by Technical English. .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Nouns, Pronouns, Adjectives, Determiners, Verb & Tenses, Auxiliary Verbs, Verbs and Adverbs Phrases, Preposition and Prepoitional Phrases, Conjunctions, Sentenses, Direct and Indirect Speech, Punicutios, Presents Continous for Future Use, Linking words, Tips for Learning Irregular Verbs, [30 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple conversations involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Nouns
Week 2	Pronouns
Week 3	Adjectives
Week 4	Determiners
Week 5	Verbs & Tenses
Week 6	Auxiliary Verbs
Week 7	Adverbs and Adverbs Phrases
Week 8	*Prepositions and Prepositional Phrases*
Week 9	*Conjunctions*
Week 10	*Sentences*
Week 11	*Direct and Indirect Speech*
Week 12	*Punctuation*
Week 13	Presents Continuous for Future Use
Week 14	Linking words
Week 15	Tips for Learning Irregular Verbs
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Basic English Grammar, Book 2, SADDLEBACK,.	Yes
Recommended Texts	Free English Grammar, Level 2, Ebook.	yes
Websites	Available online. https://preply.com/en/learn	

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	**Engineering Analysis**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM311**				
ECTS Credits	**5**				
SWL (hr/sem)	125				
Module Level		3	**Semester of Delivery**		5
Administering Department		ME	**College**	ENGINEERING	
Module Leader	Jaafar Khalaf Ali		**e-mail**	jaafar.ali@uobasrah.edu.iq	
Module Leader's Acad. Title		Ass. Prof.	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**		2.0

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 Aims أهداف المادة الدراسية	1. Preparing and qualifying engineers to meet the requirements of the labor market in the private and public sectors in mechanical engineering. 2. Providing distinguished academic programs in the field of mechanical engineering, both theoretical and practical, that comply with international standards of academic quality and meet the needs of the labor market. 3. Developing and improving scientific research in the fields of mechanical engineering, writing programs for solving differential equations and complex functions, data processing, digital signal analysis and control. 4. Preparing a stimulating environment for faculty members to develop their knowledge and educational and research skills. 5. Building and developing partnerships with the governmental and private sectors and the community with all its various institutions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**A. Knowledge and Understanding** A1- Clarify the basic concepts of Engineering Analysis and their applications in social and industrial fields. A2- Acquiring the skill in dealing with and addressing problems through the acquired sciences in this field. A3- Acquisition of basic skills to solve engineering problems. A4- Gaining experience in describing engineering problems mathematically and finding related equations to solve them. **B. Subject-specific skills** B1 - The ability to solve mathematical equations. B 2 - The ability to think about addressing problems according to the algorithms and methods of their work. B 3 - Writing scientific reports, reading charts, and analyzing digital data.
Indicative Contents المحتويات الإرشادية	**Complex variables (50 hrs.)** Complex number and variable operations, derivative and analytic functions, Cauchy Riemann equation, geometry of analytic function. Complex integration Line integral in the complex plane, Cauchy's integral theorem, Cauchy's integral formula, derivatives of analytic functions. **Fourier series (40 hrs.)** Periodic functions, Fourier series, even and odd functions, half range expansion, complex Fourier series, Fourier integral, Fourier cosine and sine transforms, Fourier transform. **Laplace Transform of Special Functions and Cases (20 hrs.)** Laplace Transform of Special Functions such as unit step, periodic function and Cases

	Inverse Laplace Transform **Partial Differential Equations (40 hrs.)** Basic concept, modeling vibrating string, wave equation, heat equation, separation of variables, D'Alembert solution of the wave equation, modeling of membrane 2D wave equation, rectangular membrane , Laplacian in polar coordinate, solution by Laplace transform.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Teaching and Learning Methods** 1. Explanation and clarification through lectures. 2. Using data show, smart boards, and plasma screens. 3. Self-learning through homework and mini-projects within the lectures. 4. Laboratories. 5. Graduation projects. 6. Scientific visits. 7. Seminars held in the department. 8. Mid-term and summer training. **Assessment methods** 1. Short exams (quizzes). 2. Homework. 3. Semester and final exams for theoretical and practical subjects. 4. Small projects within the lesson. 5. Interaction within the lecture. 6. Reports

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Complex Functions
Week 2	Special Complex Functions
Week 3	Continuity and Differentiation
Week 4	Cauchy-Riemann Equations
Week 5	Complex Integration
Week 6	Fourier Series
Week 7	Complex Fourier Series
Week 8	Laplace Transform of Special Functions and Cases
Week 9	Inverse Laplace Transform
Week 10	Ordinary Differential Equations
Week 11	Solution of ODE
Week 12	Partial Differential Equation
Week 13	Using Separation of Variables to Solve PDE (Solution of 1-Dim wave equation)
Week 14	Solution of 1-Dim Diffuse Equation
Week 15	Solution of 2-Dim Laplace Equation

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		
	Text	**Available in the Library?**
Required Texts	1.Advanced Engineering Mathematics, Wylie, McGraw Hill Books Company. 2.Advanced Engineering Mathematics, Kreyszig, Jon Wylie and Sons. 3.Mathematical Methods for Engineers and Scientists, K. T. Tang	Yes
Recommended Texts		
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	**Gas Dynamics & Turbomachines**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM312**				
ECTS Credits	8				
SWL (hr/sem)	**200**				
Module Level		3	**Semester of Delivery**		5
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Dr. Muneer A. Ismael		**e-mail**	Muneer.ismael@uobasrah.edu.iq	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Dr. Muneer A. Ismael	Dr. Muneer A. Ismael		**e-mail**	Muneer.ismael@uobasrah.edu.iq	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. Understanding the basics of compressible flow and its application to gas and compressed air transmission systems. 2. Understanding the basics of the work of rocket and jet engines. 3. Avoiding the problems of shocks and expansion waves on sonic and supersonic airplanes. 4. Understanding the principles of water turbines 5. Understanding the principles of pumps, their connection, and the problem of cavitation. 6. Understanding the principles of axial flow compressors and how to design multi-stages compressors.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Clarify the basic concepts of compressible flow. 2. Acquisition of skills in dealing with problems and issues related to compression flow. 3. Shock and expansion waves on aircraft and wedges. 4. Acquisition of basic skills as an introduction to the study of flow around aircraft. 5. Gain a basic understanding of how jet propulsion engines work. 6. The ability to gain experience in dealing with jet engines. 7. Clarify the basic concepts of fluid machinery. 8. Acquisition of basic skills in studying pump problems. 9. Gain a basic understanding of how axial gas compressors work. 10. The ability to know the types of water turbines and choose the most appropriate type according to the available water column. 11. The ability to gain experience in dealing with pumps and their problems
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Dynamics of Gases</u> Compressible flow – definition of compressible flow and how is differ from incompressible flow, Flow through variable area ducts, unusual phenomenon in compressible flow, the critical area of compressible flow [15 hrs] Solution Assist – How to use tables in solving the problems of compressible flow, how to use charts in solving the problems of shock and expansion waves. [10 hrs] Applications I – The application of compressible flow in rocket engines. [10 hrs] Applications II – The application of compressible flow in turbojet engines. [15 hrs] <u>Part B - Turbomachinery</u> Fundamentals: The role of momentum equation in studying the turbomachinery issues [10 hr]

	The importance of water turbines in renewable energy [15 hrs] The importance of pumps in industrial applications [15 hrs] The importance of axial compressor in aircraft applications [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Explanation and clarification through lectures. 2. The method of displaying scientific materials with display devices: data projectors, smart boards, and plasma screens. 3. Self-learning through homework and mini-projects within the lectures. 4. Laboratories. 5. Graduation projects. 6. Scientific visits. 7. Seminars held in the department. 8. Summer training.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	122	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 4, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 2, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 4, 9 and 11

Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction on gas dynamic and isentropic flow
Week 2	Mach number and Mach cone and flow through variable area duct
Week 3	flow cases in c-d nozzle and flow cases in a converging nozzle
Week 4	normal and oblique shock waves
Week 5	expansion wave and Prandtl Mayer function
Week 6	rocket engine and turbojet engine
Week 7	fuel consumption in turbojet engine twin-spool turbojet engine
Week 8	introduction on fluid power and impulse turbine-Pelton wheel
Week 9	reaction turbine, reaction turbine-Francis turbine
Week 10	principles and components of axial turbines, velocity diagrams in Kaplan turbine
Week 11	Similarity rules
Week 12	centrifugal pumps and pumps connection
Week 13	Cavitation in pumps
Week 14	Axial flow compressor
Week 15	Pressure ratio in axial flow compressor and the degree or reaction
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-2	Lab 1: Chocking phenomenon in compressible flow
Week 3-4	Lab 2: Efficiency of Francis turbine
Week 5-6	Lab 3: Effect of guide vanes angle on the Francis turbine

Week 7-8	Lab 4: Characteristics of centrifugal fans
Week 9-10	Lab 5: Performance of centrifugal pumps
Week 11-12	Lab 6: Series and parallel connections of centrifugal pumps
Week 13-14	Lab 7: Visualization of cavitation in pumps

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Fundamentals of Fluid Mechanics 7th Edition by Bruce R. Munson 2. Fundamentals of Gas Dynamics 3. Gas Turbine Theory by H. Cohen et al.	Yes
Recommended Texts	1. Gas dynamics by James E A John	No
Websites	https://aerospaceweb.org/design/scripts/compress.shtml	

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	**Manufacturing Processes**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM313**				
ECTS Credits	**9**				
SWL (hr/sem)	**225**				
Module Level		3	**Semester of Delivery**		5
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Rafid Jabbar Mohammed		**e-mail**	rafid.mohammed@uobasrah.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**		2.0

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 Aims أهداف المادة الدراسية	1. Preparing and qualifying specialized engineers to meet the requirements of the labor market in the private and public sectors in mechanical engineering through diversifying the methods of learning and teaching and training students to apply the acquired knowledge and skills to solve real problems. 2. Providing distinguished academic programs in the field of manufacturing processes engineering, both theoretical and practical, to comply with international standards of academic quality and meet the needs of the labor market. 3. Encouraging and developing scientific research in the fields of manufacturing processes engineering in general. 4. Preparing a stimulating environment for faculty members to develop their knowledge and educational and research skills. 5. Building and developing partnership with the governmental and private sectors and society in all its various institutions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Knowledge and Understanding A1- Clarify the basic concepts of mechanical manufacturing processes and their applications in industrial fields. A2- Acquiring the skill in dealing with manufacturing problems and solving them through mechanical calculations and mathematical models. A3- Acquisition of basic skills for the manufacture of mechanical parts. A4- Gaining experience in industrial systems and designing according to the calculation of the loads applied during the manufacturing operations. A 5- The ability to treat or avoid defects in the product during the manufacturing and production processes. B. Subject-specific skills B1 - The ability to design various manufacturing machines through knowledge of the applied loads. B2 - The ability to think and address defects that arise during manufacturing processes. B 3 - Writing scientific reports on manufacturing operations. B 4 - Choosing and determining the appropriate manufacturing process for each product according to the required specifications and product quality.
Indicative Contents المحتويات الإرشادية	**Manufacturing Processes: Introduction** **Casting fundamentals:** Casting processes characteristics**,** Casting techniques. **Sand casting:** Molding sand, Sand testing**,** Patterns, Molding machines, foundry furnaces, Cleaning and inspection of casting. **Die casting methods:** Pressure die casting methods. **Other casting methods:** Centrifugal casting , Lost-wax casting, Shell molding process, Continuous casting.

	Metal forming: Hot working of metal, Cold working of metal. **Hammering /Forging:** Types of forging processes, Hand forging tools, Automatic hammer forging, Die forging machines. **Rolling:** Types of Rolling machines, Calculation the angle of contact, Hot and cold Rolling processes. **Extrusion:** Methods of Extrusion, Tube Extrusion, Impact Extrusion. **Drawing:** Wire drawing machines, Tube drawing machines, Metal preparation for drawing. **Sheet metal work:** Processes of sheet metal forming, Joining of sheet metal, Soldering. **Metal cutting:** Chiseling steel metal, Filing steel metal, Sawing steel metal. **Turning operations:** Types of turning machines, Parts of turning machines, The lath as a general purpose machine. **Shaping operations:** Classification of shapers. **Milling operations:** Types of milling machines. **Drilling operations:** Drills, Reamers, Drilling machines, Boring machines. **Grinding operations:** Types of grinding machines, Grinding tools. **Welding:** Electric Arc Welding, Metal Arc Welding, Tungsten and Metal Inert gas welding, Plasma welding. **Fusion welding:** Oxy acetylene welding, Thermit welding, Electron beam welding, Laser welding, Ultrasonic welding, Diffusion welding, Projection welding, Flash welding. **Soldering and Brazing:** Brazing and Soldering metals and alloys, The factors that the process depends on. **Solid-state welding and other types of welding:** Electric resistance welding, Friction welding, Explosion welding. **CNC machines:** NC definition and comparison, Traditional tool machines and CNC machines comparison, Financial advantages and disadvantages of CNC, DNC- Direct numerical control CAD/CAM-Hierarchical NC. **Non Traditional machining:** Ultrasonic machining, Chemical machining, Electro chemical machining, Electro spark machining, Electron beam machining, Laser machining, Electron grinding machining

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time

	refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	137	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	9.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.86
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	225		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Manufacturing Processes; definitions, classification of engineering material, classification of manufacturing processes.

Week 2	Casting processes; definitions, calculations of solidification time and pouring time, riser design calculations, shrinkage phenomena, chill types, types of casting processes, pattern types.
Week 3	expendable mold casting, sand casting, shell casting, investment casting, evaporative-foam casting, permanent mold casting, low pressure casting, die casting, centrifugal casting, continuous casting, casting quality.
Week 4	Metal forming processes; definitions, stress-strain curve, mechanical material properties, flow stress, average flow stress, stain rate, behavior of materials at elevated temperature.
Week 5	Rolling processes; calculations of force, torque and power at cold and hot rolling, types of rolling machines, types of rolling processes
Week 6	Extrusion processes; calculations of pressure, force and power at cold and hot extrusion, types of extrusion processes, defects of extrusion processes
Week 7	Drawing processes; calculations of stress, force and power at cold drawing, types of drawing machines, nonconventional drawing processes, dieless drawing processes
Week 8	Forging processes; calculations of forging force, types of forging processes, Sheetmetal working processes; sheetmetal cutting, sheetmetal bending, sheetmetal deep drawing
Week 9	Machining processes; conventional machining processes; turning processes, milling processes, drilling processes, sawing processes, broaching processes, shaping processes, abrasive processes.
Week 10	Non-conventional machining processes; ultrasonic machining, water jet cutting, electrochemical machining, electrical discharge machining, laser beam machining, electron beam machining, plasma torch cutting, oxyfuel cutting, chemical machining.
Week 11	Calculations of cutting force and power in conventional machining, calculation of cutting time in conventional machining, optimization of cutting speed in conventional machining
Week 12	Welding processes; fusion welding processes, arc welding processes, resistance welding processes
Week 13	Solid-state welding processes, weld quality, design considerations in welding, soldering and brazing processes, mechanical assembly processes
Week 14	Manufacturing systems; manufacturing automation, manufacturing control systems,
Week 15	CNC Manufacturing; analysis of NC positioning systems, precision on NC positioning, NC part programming.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: welding test
Week 2	Lab 2: turning test
Week 3	Lab 3: drilling test
Week 4	Lab 4: shaping test
Week 5	Lab 5:
Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	FUNDAMENTALS OF MODERN MANUFACTURING: Materials, Processes and Systems, Mikel P. Groover, 4th edition, John Wiley & Sons, Inc, 2010.	Yes
Recommended Texts	FUNDAMENTALS OF MODERN MANUFACTURING: Materials, Processes and Systems, Mikel P. Groover, 4th edition, John Wiley & Sons, Inc, 2010.	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Internal Combustion Engines**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM314**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		3	**Semester of Delivery**		5
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Dr. Alaa Hlaichi Mohammed		**e-mail**	Alaa.mohammed@uobasrah.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Dr. Alaa Hlaichi Mohammed		**e-mail**	Alaa.mohammed@uobasrah.edu.iq	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. Graduating engineering cadres specialized in the fields of mechanical engineering in line with the progress made in the field of Internal Combustion Engines 2. Providing the labor market with cards that have the ability to deal with modern Internal Combustion Engines in the fields of mechanical engineering. 3. Work in scientific research in the field of Internal Combustion Engines and analysis of data in laboratory and practical results. 4. Coordination of work with researchers in Internal Combustion Engines as groups in order to advance the reality of scientific research in this field. 5. Producing projects, targeted and applicable research, and marketing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A. Knowledge and Understanding A1- Establishing the basic principles of Internal Combustion Engines. A2- Building advanced models for modern Internal Combustion Engines. A3- Designing Internal Combustion Engines for devices and equipment. A4- Maintenance of Internal Combustion Engines. A5- Developing old Internal Combustion Engines. A6 - Explanation and clarification of modern Internal Combustion Engines. A 7- Use of artificial intelligence techniques in Internal Combustion Engines. B. Subject-specific skills B1 - The possibility of studying Internal Combustion Engines in modern devices. B2 - Gaining high confidence in the ability to design modern Internal Combustion Engines. B3 - Publishing research articles in the field of measuring engineering variables..
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Basic Engine types and Their Operation</u> Introduction to reciprocating engine. Familiarization basic engine nomenclature. Engine classification by cylinder arrangement. Spark ignition engine (4 – stroke and 2 – stroke cycle). Compression ignition engine (4 – stroke and 2 – stroke cycle). Fundamental differences between SI and CI Engines. Energy flow through a reciprocating engine. Rotary engines. The continuous – combustion gas turbine. The Wankel engine. [15 hrs] Engine Power and Performance: Basic power measurements. Indicated Mean effective pressure, Indicated power. Brake power. Friction power. Mean effective power. Specific fuel consumption.. [15 hrs] Thermodynamics of I.C. Engine: The Air– Cycle approximation: importance of thermal efficiency. Theoretical cycles. Air – cycle approximations. Air – cycle calculations. Air –

	cycle efficiency. Effect of engine variables. The Fuel – Air Cycle Approximation: use of the fuel – air cycle. Scope of the fuel – air cycle. Effect of engine variables. The Actual Engine Cycle: Time required for combustion. Effect of engine variable on flame speed. Other actual – cycle losses. Power and efficiency of the actual cycle. [10 hrs]. Supercharged Engines and Their Performance:Definitions. Reasons for supercharging. Supercharging of S.I. Engine. Supercharging of Diesel Engines. Performance computations. Effects of operating variables on supercharged engines. [15 hrs] The Wankel Engine Comparison between Wankel Engine and reciprocating engine. Trochoid. Hypo – Trochoid. Wankel Engine Performance. [6 hrs] <u>Part B - Fuels of I.C. engines and Combustion</u> Fuels of I.C. engines and Combustion Calculations. Heating value of fuels. Ratings of SI Engine Fuels. Important Qualities of SI Engine Fuels. Qualities and Ratings CI Engine fuels. Combustion Calculations.. [15 hrs] Carbureting and Carburetors. Main metering system. The simple carburetor. Variables metering carburetor performance. Mixture control, carburetor types. The injection carburetor. [10 hrs] Spark Ignition. Ignition system requirements. Battery ignition system. Magneto ignition system. Spark plugs. Ignition timing. [15 hrs] General combustion theory. Normal combustion and flame front propagation. Factors affecting flame speed. Rate of pressure rise. Abnormal combustion. Engine operation variables affecting detonation. Combustion chamber design. The Compression Ignition Engine and Fuel Injection. General information pertaining to the C.I. Engine characteristics of the CI Engine. Types of CI Engines. Fuel supply and injection systems. Typical solid injection systems. The injector nozzle. [15 hrs] Combustion in the CI Engine. Ignition delay. Combustion knock in the CI Engine. Variables affecting ignition delay. General functions and characteristics of the combustion chamber. Comparison of some basic design of CI Engine combustion chamber. ([10 hrs] Cooling of IC Engine. Liquid cooling systems. Air cooling system. Engine cooling problems. Lubrication of IC Engines. Mechanism of lubrication. Types of bearings used in IC Engines. Properties of lubricating oils. Additives. Lubricating systems. Engine Design. Preliminary Analysis, cylinder number, size and arrangement. Detailed design procedure. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Use of recorded video clips. 2. Direct attendance lectures. 3. Laboratories and practical experiments. 4. Practical projects. 5. Using modern display methods such as smart screens. 6. Scientific visits. 7. Seminars held in the department. 8. Preparing lectures using modern programs.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	122	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 4, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 2, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 4, 9 and 11
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to reciprocating engine. Familiarization basic engine nomenclature.
Week 2	Engine classification by cylinder arrangement. Spark ignition engine (4 – stroke and 2 – stroke cycle). Compression ignition engine (4 – stroke and 2 – stroke cycle).
Week 3	Fundamental differences between SI and CI Engines. Energy flow through a reciprocating engine. Rotary engines. The continuous – combustion gas turbine. The Wankel engine.
Week 4	Engine Power and Performance : Basic power measurements. Indicated Mean effective pressure, Indicated power.
Week 5	Brake power. Friction power. Mean effective power. Specific fuel consumption.
Week 6	The Air – Cycle approximation: importance of thermal efficiency. Theoretical cycles.
Week 7	Mid-term Exam + Air – cycle approximations. Air – cycle calculations. Air – cycle efficiency.
Week 8	Effect of engine variables. The Fuel – Air Cycle Approximation: use of the fuel – air cycle. Scope of the fuel – air cycle. Effect of engine variables.
Week 9	The Actual Engine Cycle: Time required for combustion. Effect of engine variable on flame speed. Other actual – cycle losses. Power and efficiency of the actual cycle.
Week 10	Definitions. Reasons for supercharging. Supercharging of S.I. Engine. Supercharging of Diesel Engines. Performance computations. Effects of operating variables on supercharged engines.
Week 11	Comparison between Wankel Engine and reciprocating engine. Trochoid. Hypo – Trochoid. Wankel Engine Performance.
Week 12	Fuels of I.C. engines and Combustion Calculations. Heating value of fuels. Ratings of SI Engine Fuels. Important Qualities of SI Engine Fuels.Qualities and Ratings CI Engine fuels. Combustion calculations.
Week 13	Carbureting and Carburetors. Main metering system. The simple carburetor. Variables metering carburetor performance. Mixture control, carburetor types. The injection carburetor.
Week 14	Ignition system requirements. Battery ignition system. Magneto ignition system. Spark plugs. Ignition timing. Combustion in S.I. Engines.General combustion theory. Normal combustion and flame front propagation. Factors affecting flame speed. Rate of pressure rise. Abnormal combustion. Engine operation variables affecting detonation. Combustion chamber design.
Week 15	General information pertaining to the C.I. Engine characteristics of the CI Engine. Types of CI Engines. Fuel supply and injection systems. Typical solid injection systems. The injector nozzle. Combustion in the CI Engine. Combustion in the CI Engine. Ignition delay. Combustion knock in the CI Engine. Variables affecting ignition delay. General functions and characteristics of the combustion chamber. Comparison of some basic design of CI Engine combustion chamber.
Week 16	Liquid cooling systems. Air cooling system. Engine cooling problems. Lubrication of IC Engines Mechanism of lubrication. Types of bearings used in IC Engines. Properties of lubricating oils. Additives. Lubricating systems. Engine Design.Preliminary Analysis, cylinder number, size and arrangement. Detailed design procedure.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to IC Engine
Week 2	Lab 2: Perkins engine
Week 3	Lab 3: Ricardo engine
Week 4	Lab 4: Peter Diesel Engine
Week 5	Lab 5: Calculation of volumetric Engine
Week 6	Lab 6: Gas turbine

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Engineering Fundamentals of the Internal Combustion Engine by Willard W. Pulkrabek.	Yes
Recommended Texts	Internal Combustion Engines Fundamentals by .B. Heywood	No
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	**Numerical Analysis**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM321**				
ECTS Credits	**6**				
SWL (hr/sem)	150				
Module Level		3	**Semester of Delivery**		6
Administering Department		ME	**College**	ENGINEERING	
Module Leader	Jaafar Khalaf Ali		**e-mail**	jaafar.ali@uobasrah.edu.iq	
Module Leader's Acad. Title		Ass. Prof.	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**		2.0

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 Aims أهداف المادة الدراسية	1. Preparing and qualifying engineers to meet the requirements of the labor market in the private and public sectors in mechanical engineering. 2. Providing distinguished academic programs in the field of mechanical engineering, both theoretical and practical, that comply with international standards of academic quality and meet the needs of the labor market. 3. Developing and improving scientific research in the fields of mechanical engineering, writing programs for numerical solution of differential equations and complex functions, data processing, digital signal analysis and control. 4. Preparing a stimulating environment for faculty members to develop their knowledge and educational and research skills. 5. Building and developing partnerships with the governmental and private sectors and the community with all its various institutions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**A. Knowledge and Understanding** A1- Clarify the basic concepts of Numerical Analysis and their applications in social and industrial fields. A2- Acquiring the skill in dealing with and addressing problems through the acquired sciences in this field. A3- Acquisition of basic skills to solve engineering problems. A4- Gaining experience in describing engineering problems numerically and finding related equations to solve them. **B. Subject-specific skills** B1 - The ability to solve mathematical equations numerically. B 2 - The ability to think about addressing problems according to the algorithms and methods of their work. B 3 - Writing scientific reports, reading charts, and analyzing digital data.
Indicative Contents المحتويات الإرشادية	**Roots of equations (10 hrs.)** introduction, bisection, Newton's Raphson, modified Newton's method, The secant Method, root solving as inverse interpolation **Interpolation and extrapolation (20 hrs.)** Gregory Newton interpolation, central differences, non-equally spaced data , Lagrange Polynomials, cubic spline functions, extrapolation. **Finite Difference calculus (20 hrs.)** Forward and backward Differences, higher order expressions, central differences, differences and polynomials. **Solution of algebraic equations (20 hrs.)** Gauss and Gauss-Jordan Elimination, Gauss siedel iteration

	Curve fitting (30 hrs.) Least squares curve fitting of discrete points, the approximation of continuous function. **Numerical Integral (10 hrs.)** Trapezoidal rule, Simpson's rule, Gauss Quadrature, dealing with singularities. **Solution of ordinary differential equations (20 hrs.)** General initial value problem, euler method, truncation error, convergence and stability, runge-kutta type formulas, predictor-corrector methods, the solution of sets of simultaneous first order differential equations. **Solution of partial differential equations (20 hrs.)** Solution of Laplace equations, Poisson's equations, 1-Dim Wave equations and 1-Dim Diffusion equation

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Teaching and Learning Methods** 1. Explanation and clarification through lectures. 2. Using data show, smart boards, and plasma screens. 3. Self-learning through homework and mini-projects within the lectures. 4. Laboratories. 5. Graduation projects. 6. Scientific visits. 7. Seminars held in the department. 8. Mid-term and summer training. **Assessment methods** 1. Short exams (quizzes). 2. Homework. 3. Semester and final exams for theoretical and practical subjects. 4. Small projects within the lesson. 5. Interaction within the lecture. 6. Reports

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	58	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.86
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**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Fixed-point, Newton-Raphson
Week 2	Iteration method
Week 3	Gauss Elimination method
Week 4	Gauss-Jordan method
Week 5	Forward, Backward and Central differences
Week 6	Newton Interpolation
Week 7	Lagrange Interpolation
Week 8	Polynomial fitting

Week 9	Exponential and Power Fitting
Week 10	Trapezoidal and Simpson methods
Week 11	Euler method, Runge-Kutta method
Week 12	Runge-Kutta Second Order method
Week 13	Solution of Laplace Equation
Week 14	Solution of the Wave Equation
Week 15	Solution of Diffuse Equation

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Finding roots of equations
Week 2	Solution of Simultaneous Equations
Week 3	Finite Difference and Interpolation
Week 4	Lagrange Interpolation
Week 5	Curve Fitting
Week 6	Solution of Ordinary Differential Equations
Week 7	Solution of Partial Differential Equations

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. An Introduction to Numerical Analysis. Endre Suli. 2. Advanced Engineering Mathematics, Kreyszig, Jon Wylie and Sons. 3. Mathematical Methods for Engineers and Scientists, K. T. Tang	Yes

	4. Numerical Methods, Robert W. Hornbeck, Quantum Publishers Inc.	
Recommended Texts		
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	**Heat Transfer**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM322**				
ECTS Credits	**9**				
SWL (hr/sem)	**225**				
Module Level		3	**Semester of Delivery**		6
Administering Department		Mechanical Engineering Department	**College**	College of Engineering	
Module Leader	Falah A. Abood & Ali K. Hadi		**e-mail**	E-mail	
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	Falah.abood@uobasrah.edu.iq	
Peer Reviewer Name		Name	**e-mail**	Ali.k.hadi@uobasrah.edu.iq	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	The Heat Transfer Module is used by product designers, developers, and scientists who use detailed geometric models to study the influence of heating and cooling in devices and processes. It contains modeling tools for the simulation of all mechanisms of heat transfer including conduction, convection, and radiation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students learn the fundamental principles of heat transfer and how they can use them to solve engineering problems, in particular in heat exchanger applications. The course, which nicely blends physical and mathematical concepts, provides an excellent support to the students for expanding/developing the analytical skills built on previous knowledge of mathematics and physics. On completion, students will demonstrate sufficient skills to enable them for their future careers, and the potential for future self-directed study in this area such as, 1. Explain the basic law of heat transfer with conduction and its applications. 2. Describe fundamental rule of conduction. 3. Apply the steady state heat transfer at on a flat wall constructed in series. 4. Derive one dimensional heat flow at constant surface temperature. 5. Derive expressions related to the heat flow in fluids and analyze a heat exchanger. 6. Calculate overall heat transfer coefficient for a heat exchanger. 7. Explain heat transfer to fluids for different flow regimes without phase change. 8. Derive the equations of heat transfer by forced convection in laminar flow. 9. Derive the equations of heat transfer by forced convection in turbulent flow. 10. Derive the equations of heat transfer in transition region between laminar and turbulent flow. 11. Explain the basic rules of heat transfer to fluids with phase change. 12. Design shell and tube heat exchangers. 13. Derive the general equation of plate type heat exchangers. 14. Explain the basic rules of radiation heat transfer.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Conduction heat transfer</u> Introduction to Heat Transfer / Basics of Heat Transfer, Methods of Heat Transfer / Conduction , Convection and Radiation, One Dimensional Steady State Heat Conduction/ plane wall, One Dimensional Steady State Heat Conduction / Cylindrical and Spherical Coordinates, Thermal Resistance Concept, Multilayer Plane Walls, Multilayered/ Cylinder Sphere, Critical Radius of Insulation, Extended Surface Heat Transfer, Two-Dimensional, Steady-State Conduction, Transient Conduction, Lumped Capacity Method, The semi-infinite solid, and Heisler Charts.

	Part B – Convection Heat Transfer Introduction to Convection Heat Transfer, The Convection Boundary Layers, Local and Average Convection Coefficients, Laminar and Turbulent Flow, The Boundary Layer Equations, Physical Interpretation of the Dimensionless Parameters, External Flow, Internal Flow, Free Convection, Boiling and Condensation, and Heat Exchangers. Part C – Radiation Heat Transfer Radiation: Processes and Properties

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Strategies: 1. Collaborative Learning. 2. Technology-Based Learning. 3. Socializing with Students Before and After Class. 4. Mixing a Variety of Instructional Strategies

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	137	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	9.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.86
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	225		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Heat Transfer / Basics of Heat Transfer
Week 2	Methods of Heat Transfer / Conduction , Convection and Radiation
Week 3	One Dimensional Steady State Heat Conduction/ plane wall
Week 4	One Dimensional Steady State Heat Conduction / Cylindrical and Spherical Coordinates
Week 5	Extended Surface Heat Transfer
Week 6	Two-Dimensional, Steady-State Conduction
Week 7	Transient Conduction
Week 8	Introduction to Convection Heat Transfer
Week 9	External Flow
Week 10	Internal Flow
Week 11	Cross Flow
Week 12	Free Convection
Week 13	Boiling and Condensation
Week 14	Heat Exchangers
Week 15	Radiation heat transfer
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Calibration of Thermocouple
Week 2	Lab 2: Cross-Flow Heat Exchanger
Week 3	Lab 3: Natural Convection Heat Transfer
Week 4	Lab 4: Forced Convection Heat Transfer
Week 5	Lab 5: Radiation Heat Transfer
Week 6	Lab 6: Boiling Heat Transfer

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals_of_Heat_and_Mass_Transfer BY: Frank P. Incropera	Yes
Recommended Texts	Heat Transfer: A Practical Approach By: Yunus A. Cengel	No
Websites	https://eng.uobasrah.edu.iq/mechanical-engineering-department	

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	**Theory of Machine**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM323**				
ECTS Credits	8				
SWL (hr/sem)	**200**				
Module Level		3	**Semester of Delivery**		6
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Mr. Murtadha Q. Dinar		**e-mail**	Pgs2337@uobasrah.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	**Module Leader's Qualification**		MSc.
Mr. Murtadha Q. Dinar	Mr. Murtadha Q. Dinar		**e-mail**	Pgs2337@uobasrah.edu.iq	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. Understanding the Sub-divisions of Theory of Machines and review for units, scalars and vectors. 2. Study the instantaneous centre method for finding the velocity and acceleration of various points in the mechanisms to draw the space, velocity and acceleration diagram. 3. Understanding the classification of Followers and cams, motion of the follower, displacement diagrams and construction of cam profile. 4. Understanding the principles of gyroscope and their effect on ships and aircraft. 5. Understanding the principles flywheel (Benefits and details) and study the Turning moment diagram. 6. Study the Introduction to clutches, types of clutches, instruction and its equations. 7. Understanding the principles types, applications and equation of belt drive. 8. Understanding the principles of governors (Watt, porter, Proell and Hartenall gov.) in addition to Equations & details. 9. Study the Balance of rotating masses which include: equations and details of (Static and dynamic Balance for the Same plane and different planes in Balance of rotating masses). 10. Study the Introduction to gear, types, Define, drive and its equations. 11. Understanding the automatic control of machines which include Equations of control systems (Overall Transfer Function for a system with viscous Damped Output).
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Clarify the basic concepts of theory of machines. 2. Gaining skills in graphing to solve problems and issues related to velocity and acceleration diagrams. 3. Acquisition of basic skills as an introduction to the study of Followers and cams. 4. Gain a basic understanding of how gyroscope effect on ships and aircraft. 5. The ability to gain experience in dealing flywheel and turning moment diagram. 6. Clarifying the basic concepts of clutches and belt drives in terms of types, working principle and equations. 7. Acquisition of basic skills in the study of control by means of mechanical machines (governors) of all kinds. 8. Gain a basic understanding of how to balance rotating masses. 9.The ability to know the types of gears and choose the appropriate type according to the available speed. 10. Clarify the basic concepts of automatic control of machines.

Indicative Contents المحتويات الإرشادية	• Readings, self-learning, panel discussions. • Exercises and activities in the lecture. Homework. • Directing students to some websites to benefit and develop capabilities. • Conducting seminars to explain and analyze a specific issue and find solutions to it.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Explanation and clarification through lectures. 2. The method of displaying scientific materials with display devices: data projectors, smart boards, and plasma screens. 3. Self-learning through homework and mini-projects within the lectures. 4. Laboratories. 5. Graduation projects. 6. Scientific visits. 7. Seminars held in the department. 8. Summer training.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	122	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 4, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 2, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 4, 9 and 11
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction on theory of machine and velocity diagram (Simple crank mech).
Week 2	Velocity diagram (slider and slot). Acceleration diagram (Simple crank mech).
Week 3	Acceleration diagram (slider and slot).
Week 4	cams and followers, cam and follower strokes (Uniform velocity and SHM).
Week 5	Cam and follower diagrams two scale.
Week 6	Gyroscopic and gyroscopic applications.
Week 7	Flywheels and Turning moment diagrams (benefits, details, equations and applications)
Week 8	Clutches (Types and equations).
Week 9	Belt drive (Introductions for types, applications and equations).
Week 10	Governors (Introductions for types and applications). Watt and porters gov.
Week 11	Proell and Hartenall governors.
Week 12	Balance of rotating masses (Static and dynamic balance of rotating masses)
Week 13	Same and different planes in balance of rotating masses
Week 14	Introductions for types and applications of Gear
Week 15	Automatic control of machines.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-2	Simple crank mechanism
Week 3-4	Cams and Follower
Week 5-6	Flywheel
Week 7-8	Gyroscope
Week 9-10	Governor
Week 11-12	Balances of rotating masses
Week 13-14-15	Practical test for students in one of the experiments
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Theory of machines. London, E. Arnold.	Yes
Recommended Texts	Theory of Machines by RS Khurmi and JK Gupt	No
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	**Design of Machine Elements I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	BEM 324				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		3	**Semester of Delivery**		6
Administering Department			**College**		
Module Leader	Ali H. Zaibel		**e-mail**	Ali.zaibel@uobasrah.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Ali H. Zaibel		**e-mail**	Ali.zaibel@uobasrah.edu.iq	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		01/10/2024	**Version Number**		2.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Strength of material	**Semester**	3
Co-requisites module	Engineering mechanics -statics	**Semester**	1

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Provide an education that builds within students a solid foundation in mechanical engineering principles 2. Prepares graduates who have the motivation and ability for lifelong growth in their professional careers 3. Understand the mechanical engineering design elements enough to commit to major designs and create a career plan 4. To teach students how to apply mechanical engineering design theory to identify and quantify machine elements in the design of commonly used mechanical systems
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Clarify the basic concepts in the design of machines through the design of mechanical elements and components. 2. Acquisition of skills in dealing with engineering problems and issues. 3. Acquisition of basic skills as introductions to building mechanical designs. 4. Gain a basic understanding of how mechanical systems work in various industrial applications. 5 The ability to design applied mechanical problems. 6 The ability to think about solving a specific engineering problem or problem. 7 Writing scientific reports. 8 The ability to gain experience in dealing with mechanical systems
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Stress analysis: Stress types, Mohr circle and definition of Principal stresses Curved beams: Neutral axis calculation and Calculation of maximum stresses Static loading: Basic definition and Failure theories: 1. ductile materials: Rankine, Tresca and Von- Mises theories 2. brittle materials: Rankine, Mohr and modified Mohr theories Fatigue loading: 1. basic definition, concept of Fatigue test, S-N curve and endurance limit. 2. Modification factors: Correction of endurance limit for real environmental conditions 3. Failure theories for dynamic loading: Goodman diagram and Calculation of safety factors. Spring :

	1. spring types, Basic definitions and terminology. 2. Stress analysis: maximum Shear stress, spring stiffness, spring materials and strengths 3. dynamic loading, Estimate spring life and safety factor.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	107	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	68	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.53
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 4, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 2, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 4, 9 and 11
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Stress analysis, Stress types, Mohr circle
Week 2	Stress analysis, Principal stresses
Week 3	Curved beams, Neutral axis calculation
Week 4	Curved beams, Calculation of maximum stresses
Week 5	Static loading, basic definition
Week 6	Failure theories, ductile materials: Rankine, Tresca and Von- Mises theories
Week 7	Failure theories, brittle materials: Rankine, Mohr and modified Mohr theories
Week 8	Fatigue loading: basic definition
Week 9	Fatigue test, S-N curve and endurance limit
Week 10	Modification factors: Correction of endurance limit for real environmental conditions
Week 11	Failure theories: Goodman diagram and Calculation of safety factors
Week 12	Spring types, Basic definitions and terminology

Week 13	Stress analysis: max. Shear stress, spring stiffness
Week 14	Spring materials and strengths
Week 15	Springs: dynamic loading, Estimate spring life and safety factor
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: deflection of undetermined beams
Week 2	Lab 2: deflection of continuous beams
Week 3	Lab 3: deflection of curved beams
Week 4	Lab 4: Fatigue test
Week 5	Lab 5: thick cylinders
Week 6	Lab 6: thin cylinders
Week 7	Lab 7: application of strain gauges

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Shigley's Mechanical Engineering Design 10th Edition by Richard Budynas and Keith Nisbett	Yes
Recommended Texts	An Introduction to Mechanical Engineering 4th Edition by Jonathan Wickert and Kemper Lewis	No
Websites	https://nptel.ac.in/courses/112/105/112105124/	

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	**Design of Machine Elements II**	**Module Delivery**	
Module Type	**Core**	☒ **Theory** ☒ **Lecture** ☐ **Lab** x **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	BEM 411		
ECTS Credits	**4**		
SWL (hr/sem)	**100**		
Module Level	4	**Semester of Delivery**	7
Administering Department		**College**	
Module Leader	Ali H. Zaibel	**e-mail**	Ali.zaibel@uobasrah.edu.iq
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	Ali H. Zaibel	**e-mail**	Ali.zaibel@uobasrah.edu.iq
Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	01/10/2024	**Version Number**	2.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**Semester**	
Co-requisites module		**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Provide an education that builds within students a solid foundation in mechanical engineering principles 2. Prepares graduates who have the motivation and ability for lifelong growth in their professional careers 3. Understand the mechanical engineering design elements enough to commit to major designs and create a career plan 4. To teach students how to apply mechanical engineering design theory to identify and quantify machine elements in the design of commonly used mechanical systems
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Clarify the basic concepts in the design of machines through the design of mechanical elements and components. 2. The ability to gain experience in dealing with mechanical elements 3. Acquisition of basic skills as introductions to building mechanical designs. 4. Gain a basic understanding of how mechanical systems work in various industrial applications. 5. The ability to design applied mechanical problems. 6. The ability to think about solving a specific engineering problem or problem. 7. Writing scientific reports. 8. The ability to gain experience in dealing with mechanical systems
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to screws and fasteners Power screw: efficiency of power screws Bolted joints in tension: Load ratio between bolt and members Bolted joints in shear- eccentric, Calculation of load carried by each bolt Dynamic loading in tensile joints, Load safety factor and separation safety factor Introduction to welding: Welding codes and types Welding joints: analysis in shear stress Welding joints: analysis in bending stress Introduction to gears: Gear types and definitions Gears interaction, definition of gear train, Conjugate action and involute properties and gear teeth forming, gear trains Force analysis, spur gears and helical gears Calculation of stress using AGMA equation

	Types of rolling contact bearing, bearing life, Rating life, selection of bearing

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	38	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.53
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 4, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 2, 4, 6 and 8
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 4, 9 and 11
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-6
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to screws and fasteners
Week 2	Efficiency of power screws
Week 3	Bolted joints in tension: Load ratio between bolt and members
Week 4	Bolted joints in shear- eccentric
Week 5	Dynamic loading in tensile joints
Week 6	Introduction to welding: Welding codes and types
Week 7	Welding, joint analysis in shear stress
Week 8	Welding, joint analysis in bending stress
Week 9	Introduction to gears: Gear types and definitions
Week 10	Conjugate action, involute properties
Week 11	Contact ratios, gear teeth forming, gear trains
Week 12	Force analysis, spur gears and helical gears
Week 13	Calculation of stress using AGMA equation
Week 14	Types of rolling contact bearing, bearing life

Week 15	Rating life, selection of bearing
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Shigley's Mechanical Engineering Design 10th Edition by Richard Budynas and Keith Nisbett	Yes
Recommended Texts	An Introduction to Mechanical Engineering 4th Edition by Jonathan Wickert and Kemper Lewis	No
Websites	https://nptel.ac.in/courses/112/105/112105124/	

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	**Engineering Materials**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM412**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		4	**Semester of Delivery**		7
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Dr. Murtadha A. Jabbar		**e-mail**	murtadha.jabbar@uobasrah.edu.iq	
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Dr. Murtadha A. Jabbar	Dr. Murtadha A. Jabbar		**e-mail**	murtadha.jabbar@uobasrah.edu.iq	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	Identifying the ferrous and non-ferrous materials, their properties and applications 2. Studying of ceramic materials. 3. Studying polymers and identifying their mechanical properties 4. Studying of composite materials and address their mechanical properties. 5. Describe the mechanism of crack propagation for both ductile and brittle modes of fracture. Define fracture toughness 6. Define fatigue and specify the conditions under which it occurs. Determine the fatigue lifetime and the fatigue strength. 7. Define creep and specify the conditions under which it occurs. Determine the steady-state creep rate, and the rupture lifetime. 8. Understanding of the mechanisms of corrosion and corrosion prevention.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the structures, properties and applications of metals, ceramics, polymer and composite materials. 2. Proper materials selection for engineering applications. 3. diagnosis of cause(s) and mechanisms of failure. 4. Understanding the mechanisms of failure such as fracture, fatigue, creep or corrosion 5. The philosophy of performing failure analysis and steps involved in failure analysis investigations 6. Case studies on documented engineering failures and failure analysis reports will be discussed.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A – Engineering Materials** 1.Clarify the basic concepts of engineering materials and their classification 2.The ability to know the classifications of engineering materials. 3. The ability to think about choosing the appropriate materials for engineering applications. 4. The ability to gain experience in dealing with changes that occur to engineering materials as a result of different operating conditions **Part B – Failure Analysis** 1. The ability to calculate the mechanical properties of engineering materials. 2. The ability to think about the treatment of various failure problems. 3. Writing scientific reports. 4. The ability to gain experience in dealing with corrosion protection systems

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Explanation and clarification through lectures. 2. The method of displaying scientific materials with display devices: data projectors, smart boards, and plasma screens. 3. Self-learning through homework and mini-projects within the lectures. 4. Laboratories. 5. Graduation projects. 6. Scientific visits. 7. Seminars held in the department. 8. Summer training.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	38	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.53
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 4and 5
	Assignments	2	10% (10)	4, 12	LO # 1, 2, 3 and 6
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 2, 4 and 6
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1,3
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Nomenclature of Ferrous Alloys, Low Carbon steel, Medium Carbon Steel, High Carbon Steel, Effects of Alloying Elements on Steel,
Week 2	Low Alloy Steels, Stainless-Steels, Heat Treatment of Steels, Cast Irons
Week 3	Light Metals, Heavy Metals, Refractory Metal, Precious Metals, Precipitation Hardening
Week 4	Spectrum of Ceramics Uses, Ceramic Crystal Structures, Properties of Ceramics
Week 5	Mechanical Properties Stress –Strain Behavior (Flexural Strength), Traditional Ceramics, Advanced Ceramics
Week 6	Classification of polymers, Synthetic of Polymers, Mechanical Properties, Viscoelasticity, Viscoelastic Creep
Week 7	Classification of Composite Materials According to Type of Reinforcement and Matrix Type of constituents, Particle reinforced composite materials
Week 8	Properties of Composites Rule of mixtures Fiber reinforced composite materials Types of fibers, Structural composite materials
Week 9	Elastic Deformation, Stress-Strain Behavior, Tensile Properties, True Stress and Strain, Hardness.
Week 10	Fundamentals of Fracture, Ductile Fracture, Brittle Fracture, Principles of Fracture Mechanics, and Impact Fracture Testing
Week 11	Cyclic Stresses, the S–N Curve, Crack Initiation and Propagation, Factors that Affect Fatigue Life
Week 12	Environmental Effects Generalized Creep Behavior, Stress and Temperature Effects
Week 13	Data Extrapolation Methods (Larson- Miller Methods), Alloys for High-Temperature Use
Week 14	Electrochemical Considerations, Forms of Corrosion
Week 15	Forms of Corrosion, Corrosion Prevention, wear
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Materials Science and Engineering, William D. Callister 2. The Science and Engineering of Materials by D. R. Askeland, and P. Phule	Yes
Recommended Texts	Mechanical Behavior of Materials M.A. Meyers and K. K. Chawla	No
Websites	https://aerospaceweb.org/design/scripts/compress.shtml	

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	**Power Plants**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM413**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		4	**Semester of Delivery**		7
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Dr Ahmad Abdulkarim Mahdi		**e-mail**	Ahmad.mahdi@uobasrah.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**		2.0

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 Aims أهداف المادة الدراسية	1. Graduating engineers specialized in the fields of power plant in line with the progress made in the field of power plants including the clean energy power plant. 2. Providing the labor market with engineers capable to deal with modern power plant. 3. Coordination of work with researchers in power plant as groups to advance the reality of scientific research in this field. 4. Producing projects and applicable research, and marketing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowledge and Understanding A1- Establishing the basic principles of thermodynamics. A2- Identifying the types of conventional and non-conventional electric power stations. A3- Explanation and clarification of modern methods of power stations.. A4- Use of alternative and environmentally friendly stations. 2. B. Subject-specific skills B1- The possibility of studying power stations and identifying their parts. B2 - Gaining high confidence in the ability to operate and design power stations.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>1. General introduction on power plants [20 hrs]</u> Review of the important basics of thermodynamics, fluid mechanics and heat transfer. Definition of the important concepts and classification of power plants, Principle of work of conventional power plants (steam, gas, nuclear, diesel and hydro power plants). Principle of work of the important nonconventional power plants (fuel cells, PV cells, biogas power, geothermal energy, ocean energy, wind energy, wave energy and tidal energy). <u>2. Gas turbine power plants [20 hrs]</u> Types of gas turbine cycles, principle of work, advantage and disadvantage of gas turbine unit. Thermodynamics and performance analysis of simple gas turbine cycle. Modifications to the basic cycle Performance analysis of the modified cycle (reheat, regenerative and multi-stage compression with inter-cooling. <u>Steam turbine power plants [20 hrs]</u> Steam power plant cycles (Carnot cycle, ideal Rankin cycle and actual Rankin cycle.

	Thermodynamics and performance analysis of simple steam turbine cycle. Modifications to the simple Rankin cycle . Rankin cycle with superheat. The reheat Rankin cycle The regenerative Rankin cycle Combined gas steam power plants <u>Boilers [20 hrs]</u> Classifications of steam generators, Boiler coils and equipments and the requirements of good boiler. Principle of work of fire tube, water tube and heat recovery boilers Boiler calculations and performance <u>Condensers [20 hrs]</u> Types of condensers, Elements of the steam condenser, air ejectors and the requirements of an efficient condenser. Steam condenser performance analysis. <u>Steam turbine [20 hrs]</u> The impulse steam turbine velocity diagrams. Pressure and velocity compounded impulse steam turbine. The axial - flow reaction turbines Optimum operating conditions from blade velocity diagrams. Turbine blade height and design

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Use of recorded video clips. 2. Direct attendance lectures. 3. Laboratories and practical experiments. 4. Practical projects. 5. Using modern display methods such as smart screens. 6. Scientific visits. 7. Seminars held in the department. 8. Preparing lectures using modern programs.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	122	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #A1, to B2
	Assignments	2	10% (10)	2, 12	LO #A1, to B2
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #B1 to B2
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO #A1 to A4
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - Review of the important basics of thermodynamics, fluid mechanics and heat transfer.
Week 2	Definition of the important concepts and classification of power plants
Week 3	Classification of power plants
Week 4	Gas turbine power plants, Types of gas turbine cycles, principle of work, advantage and disadvantage
Week 5	Types of gas turbine cycles, principle of work, advantage and disadvantage
Week 6	Performance analysis of the modified cycle
Week 7	Mid-term Exam Performance analysis of the modified cycle
Week 8	Classifications of steam generators

Week 9	Boiler calculations and performance
Week 10	Boiler calculations and performance
Week 11	Types of condensers, Elements of the steam condenser
Week 12	Steam condenser performance analysis
Week 13	Steam condenser performance analysis
Week 14	The impulse steam turbine velocity diagrams
Week 15	**Optimum operating conditions of turbine**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Power plant components
Week 2	Lab 2: Evaluate the power plant efficiency
Week 3	Lab 3: Evaluate the steam turbine efficiency
Week 4	Lab 4: Evaluate the Gas turbine efficiency
Week 5	Lab 5: Nozzles
Week 6	Lab 6: Condenser efficiency
Week 7	Lab 7: Boiler efficency

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	POWER PLANT ENGINEERING A.K. Raja	Yes
Recommended Texts	Applied Thermodynamic For Engineering By Onkar Singh	Yes
Websites	https://www.coursera.org/browse/physical-science-and-engineering	

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	**Control & Measurements**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM414**				
ECTS Credits	**9**				
SWL (hr/sem)	**225**				
Module Level	4	**Semester of Delivery**	7		
Administering Department	Mechanical	**College**	Engineering		
Module Leader	Imad A. Kheioon	**e-mail**	Imad.kheioon@uobasra.edu.iq		
Module Leader's Acad. Title	lecturer	**Module Leader's Qualification**	Ph.D.		
Module Tutor	Name (if available)	**e-mail**	E-mail		
Peer Reviewer Name	Name	**e-mail**	E-mail		
Scientific Committee Approval Date	01/10/2024	**Version Number**	2.0		

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 Aims أهداف المادة الدراسية	1. Graduating engineering cadres specialized in the fields of mechanical engineering in line with the progress made in the field of controlling devices and equipment. 2. Providing the labor market with cards that have the ability to deal with modern control techniques in the fields of electric power production, oil and heavy equipment. 3. Work in scientific research in the field of controlling engine speed, pressure, distances and production lines in factories. 4. Coordination of work with researchers in control techniques as groups in order to advance the reality of scientific research in this field. 5. Producing projects, targeted and applicable research, and marketing. 6. Graduating engineering cadres specialized in the fields of mechanical engineering in line with the progress made in the field of measuring variables in devices and equipment. 7. Providing the labor market with cards that have the ability to deal with modern measuring equipment techniques in the fields of mechanical engineering. 8. Work in scientific research in the field of measurement and analysis of data in laboratory and practical results. 9. Coordination of work with researchers in measurement techniques as groups in order to advance the reality of scientific research in this field.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Establishing the basic principles of control systems. 2- Building advanced models of modern control systems. 3- Designing control systems for devices and equipment. 4- Maintenance of control systems. 5- Developing old control systems. 6- Explanation and clarification of modern methods of control systems. 7- The use of artificial intelligence techniques in control systems. 8- Establishing the basic principles of measurement systems. 9- Building advanced models for modern measurement systems. 10- Designing measuring systems for devices and equipment. 11- Maintenance of measurement systems. 12- Developing old measurement systems. 13- Explanation and clarification of modern methods of measurement systems. 14- Use of artificial intelligence techniques in measurement systems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Reading the relevant books in the field of the course. • Discussion within the lesson. • Solve some advanced issues. • Searching websites. • Attending scientific conferences.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Activating the participation of students. Paying attention to the student's desire to accept the lesson material. Evaluation of the students interacting in the lesson. Presenting practical examples that interest the students for the lesson. Presenting various topics to keep the recipient away from boredom and boredom.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	137	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	9.1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	225		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to control system + Measurement Systems
Week 2	Laplace transform+ Measurement Errors

Week 3	Modeling of dynamic systems+ Modeling Measurement Systems
Week 4	Modeling of liquid level control systems+ Sensors
Week 5	Modeling of pneumatic control systems+ Sensors
Week 6	Modeling of hydraulic control systems+ Microsensors
Week 7	Modeling of heat control systems+ Microsensors
Week 8	Second order system+ Signal Conditioning And Processing
Week 9	Stability+ Signal Conditioning And Processing
Week 10	Steady state errors+ Signal Conditioning And Processing
Week 11	Root locus+ Force, Torque, Pressure And Strain Measurement
Week 12	Root locus+ Force, Torque, Pressure And Strain Measurement
Week 13	Root locus+ Force, Torque, Pressure And Strain Measurement
Week 14	Frequency response analyses+ Position And Motion Measurement
Week 15	Bode diagram+ Position And Motion Measurement
Week 16	Bode diagram+ Flow And Temperature Measurement

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: On-off control
Week 2	Lab 2: PID control
Week 3	Lab 3: calibration
Week 4	Lab 4: Experimental errors
Week 5	Lab 5: strain gauge
Week 6	Lab 6: I-P convert
Week 7	Lab 7: liquid level control

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Measurement and Instrumentation Systems By W. Bolton 2- Modern control engineering By Katsuhiko Ogata	Yes
Recommended Texts	1- Principles of control systems by S.P.Eugene 2- Linear control systems with MATLAB applications by B.S. Manke	No
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	**Renewable Energy**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM421**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	4		**Semester of Delivery**	8	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr.Salman H.Hammadi		**e-mail**	Salman.hammadi@uobasrah.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/10/2024		**Version Number**	2.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Thermodynamics, Heat transfer, fluid mechanics	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Preparing engineers for meeting the labor market in the field of renewable energy 2. Encouraging and developing scientific research in the fields of mechanical engineering, especially renewable energy systems. 3. Preparing a suitable environment for faculty members to develop their knowledge and research skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1 - The ability to design a renewable energy system 2 – Understanding renewable energy system
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Solar Energy</u> Introduction of thermodynamics, energy, work, entropy, available energy, exergy, the principle of solar energy, solar radiation estimation, solar collectors, solar chimney power plant, solar tower power plant, solar water heater, solar air heater, solar still. (30 hrs.) <u>Part B –Other renewable energies</u> Wind energy, wind turbine, geothermal energy, tidal energy, wave energy. (15 hrs.)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	38	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.53
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of thermodynamics
Week 2	Available energy and exergy concept
Week 3	Fundamental of solar radiation
Week 4	Estimation of solar radiation
Week 5	Solar collectors
Week 6	Solar updraft power plant
Week 7	Concentrating solar thermal power plant
Week 8	Solar water heating system
Week 9	Solar air heater system

Week 10	Solar Desalination system
Week 11	Wind energy
Week 12	Wind turbine
Week 13	Geothermal Energy
Week 14	Tidal energy
Week 15	Wave energy
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of Renewable Energy Processes, Fourth Edition (Instructors Edu Resource 1 of 2 (Aldo Vieira da Rosa, Juan Carlos Ordonez	No
Recommended Texts	Solar Energy Engineering Processes And Systems-Academic Press (2009)	No
Websites	Understanding Renewable Energy Systems (Volker Quaschning)	

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	**Industrial Engineering and Management**			**Module Delivery**	
Module Type	**Support**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM422**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		4	**Semester of Delivery**		8
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title		Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**		2.0

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 Aims أهداف المادة الدراسية	1. Develop knowledge of industrial engineering principles. 2. Foster an understanding of project management principles. 3. Enhance problem-solving and analytical skills. 4. Develop critical thinking and decision-making abilities. 5. Cultivate effective communication and teamwork skills. 6. Promote ethical and sustainable practices.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Apply industrial engineering principles to optimize processes and systems for enhanced productivity and efficiency. 2. Utilize project management techniques to plan, execute, and monitor projects effectively, meeting specified goals and deadlines. 3. Analyze and improve work design to enhance employee productivity, satisfaction, and safety. 4. Implement quality management techniques to ensure high standards and continuous improvement. 5. Employ operations research methods to solve complex problems and make data-driven decisions. 6. Demonstrate proficiency in supply chain management, optimizing the flow of goods and resources. 7. Utilize facility layout strategies to optimize space utilization and streamline operations. 8. Evaluate and mitigate risks associated with projects, ensuring successful project completion. 9. Estimate project costs accurately, manage budgets, and monitor financial performance. 10. Demonstrate effective communication, leadership, and teamwork skills in industrial and project management settings.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Industrial Engineering [30 hr]</u> Operation research Maintenance Engineering Fundamentals of Control: INVENTORY MANAGEMENT AND CONTROL Fundamentals of Control: INVENTORY MANAGEMENT AND CONTROL Break Even Analysis Sequencing Introduction to Transportation Problem Introduction to Transportation Problem Assignment Problem Assignment Problem

	Games with Mixed Strategies Introduction to Linear Programming Introduction to Linear Programming <u>Part B – Project Management [30 hr]</u> Fundamentals Project Initiations Planning Activity Networks Activity Networks- -examples Project Resource Analysis Project Resource Analysis examples SOLVED PROBLEMS Risk Management Risk Management examples NPV NPV EXAMPLES COST MANAGMNET Cost management examples

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The strategies employed in the Industrial Engineering and Management module focus on promoting active student participation and cultivating critical thinking skills. This is achieved through interactive classes, engaging tutorials, and the inclusion of practical experiments. The module incorporates sampling activities that are designed to captivate students' interest and align with the principles of industrial engineering and project management. By encouraging participation and hands-on learning, students develop their analytical abilities and gain a deeper understanding of the subject matter. These strategies create an engaging and dynamic learning environment that prepares students for real-world challenges in the field of industrial engineering and project management.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction. Operation research
Week 2	Maintenance Engineering, Fundamentals of Control: INVENTORY MANAGEMENT AND CONTROL
Week 3	Fundamentals of Control: INVENTORY MANAGEMENT AND CONTROL, Break Even Analysis
Week 4	Sequencing, Introduction to Transportation Problem
Week 5	Introduction to Transportation Problem, Assignment Problem
Week 6	Assignment Problem, Games with Mixed Strategies
Week 7	Introduction to Linear Programming, Introduction to Linear Programming
Week 8	Introduction to project Management , Project Initiations
Week 9	Planning, Activity Networks

Week 10	Activity Networks- -examples, Project Resource Analysis
Week 11	Project Resource Analysis examples, SOLVED PROBLEMS
Week 12	Risk Management, Risk Management examples
Week 13	NPV, NPV EXAMPLES
Week 14	COST MANAGMNET, Cost management examples
Week 15	Solved problems
Week 16	**Preparatory week before the final Exam**

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		
	Text	**Available in the Library?**
Required Texts	Lectures for Industrial Engineering and Management	Yes
Recommended Texts		
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	**Air conditioning and refrigeration**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM423**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	4		**Semester of Delivery**	8	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Dr.Salman H.Hammadi		**e-mail**	Salman.hammadi@uobasrah.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/10/2024		**Version Number**	2.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Thermodynamics, Heat transfer, fluid mechanics	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Preparing engineers for meeting the labor market needs of private and public sectors in the mechanical engineering field through diversifying the methods of learning, teaching, and training for the students. 2. Providing academic programs in the field of mechanical engineering, both theoretical and practical, according to the international standards of academic quality and the needs of the labor market. 3. Encouraging and developing scientific research in the fields of mechanical engineering in the fields of air conditioning and thermal performance of buildings. 4. Preparing a suitable environment for faculty members to develop their knowledge and research skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1 - The ability to design air conditioning systems. 2 - The ability to think about addressing the problems of the large heat gain in buildings during the summer. 3 - The ability to deal with modern software for cooling load calculations and designing air duct systems and chilled or hot water pipes in central air conditioning systems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Air conditioning</u> Introduction of moist air properties, Relative humidity, moisture content, Relative humidity, moisture content, Air conditioning processes, and psychometric chart, Sensible and latent heat, Humidification, and dehumidification of air, Adiabatic mixing, and adiabatic saturation, Summer air conditioning systems, Cooling load estimation, Steady state heat conduction in buildings, Unsteady state heat conduction in buildings, Cooling load items, examples and applications, Heating load estimation, Duct design, [80 hrs.] <u>Part B – Refrigeration</u> System of air conditioning, Pipe system design, Chillers, Refrigeration, Vapor compression refrigeration system, Carnot refrigeration cycle, Ideal refrigeration cycle, Real vapor compression refrigeration cycle, Absorption refrigeration system, Steam jet refrigeration, Air cycle refrigeration, Cold storage.[40 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	137	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	9.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of moist air properties
Week 2	Air conditioning processes and psychometric chart
Week 3	Summer air conditioning systems
Week 4	Cooling load estimation
Week 5	Heat conduction in buildings
Week 6	Cooling load items, examples, and applications
Week 7	Heating load estimation
Week 8	Ducts design
Week 9	Systems of air conditioning
Week 10	Pipes system design
Week 11	Ideal refrigeration cycles
Week 12	Vapor compression refrigeration cycle
Week 13	Absorption refrigeration system
Week 14	Steam jet and Air refrigeration cycles
Week 15	Unconventional refrigeration system and cold storage
Week 16	**The preparatory week before the Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to moist air properties
Week 2	Lab 2: psychometric processes
Week 3	Lab 3: cooling and dehumidification
Week 4	Lab 4: Heating and humidification
Week 5	Lab 5: Air distribution system
Week 6	Lab 6: vapor compression refrigeration system
Week 7	Lab 7: Heat pump

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Air conditioning engineering Fifth edition, W.P.Jones	Yes
Recommended Texts	Handbook of air conditioning and Refrigeration Shan K. Wang	No
Websites	Refrigeration and air condition C.P. Arora	

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	**Theory of Vibrations**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**BEM424**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level		4	**Semester of Delivery**		8
Administering Department		Mechanical	**College**	Engineering	
Module Leader	Abdulbaseer S. Bahedh		**e-mail**	abdalbaseer.baheth@uobasrah.edu.iq	
Module Leader's Acad. Title		Assist. Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	-		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/10/2024	**Version Number**	2.0	

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 Aims أهداف المادة الدراسية	1. Acquisition of skills in dealing with engineering problems and issues related to vibrations. 2. Acquiring basic skills as an introduction to understanding the principles of vibration. 3. Gain a basic understanding of how vibrations occur in various industrial applications. 4. Preparing and qualifying specialized specialists for the requirements of the labor market in the private and public sectors in mechanical engineering through diversification in the methods of learning and teaching and training students to apply the acquired knowledge and skills in mathematics. 5. Providing distinguished academic programs in the theoretical and practical fields of mechanical engineering and international quality rules that meet the needs of the labor market. 6. The emergence of scientific research in the field of mechanical engineering, vibrations in general, the principles of vibration theory, and how vibrations are generated in parts. 7. Preparing a stimulating environment for faculty members to develop their knowledge and educational skills. 8. Building development and government social affairs, and, and, and society in all different institutions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Clarify the basic concepts. 2. Acquisition of skills in dealing with engineering problems and issues related to vibrations. 3. Acquiring basic skills as an introduction to understanding the principles of vibration. 4. Gain a basic understanding of how vibrations occur in various industrial applications. 5. Gain a basic understanding in vibration tools and instruments. 6. Gain a basic understanding in Vibration analysis programs.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – Principles of vibration systems</u> <u>Single Degrees of Freedom:</u> Fundamentals of Vibrations. Importance of Study of Vibrations. Classification of vibration. Free Vibrations of Single Degree of Freedom. Vibration of undamped Torsional Systems. Vibrations of systems with Viscous Damping. [24 hrs.]. Forced vibration for undamped and damped system. Response of Damped system under harmonic motion of base. Response of Damped system under Rotating Unbalance. [16 hrs.].

	Multi-Degree of Vibration Systems. Derivation of Equation of Motion. Normal Mode Vibration. Coordinate Coupling. Eigenvalue and Eigenvector. Forced harmonic vibration. Influence coefficients. Lagrange's Equation [20 hrs.]. Part B – Vibration Applications Determination of Natural Frequency and Modal Shapes: Rayleigh's Method. Dunkerley's Formula. Holzer's Method [15 hrs.] Continuous Systems: Transverse Vibration of String. Longitudinal Vibrations of rod. Torsional Vibrations of Shafts and Rods. [15 hrs.] Vibration Control: Balancing of Rotating Machines. Whirling of rotating Shafts. Vibration Isolation. Control of Natural Frequencies. [15 hrs.]. Vibration Measurements: Vibration Pickups. Vibration Exciters. Signal Analysis [15 hrs.]. Review and discussion [8 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	122	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	8.13
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.20
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - Fundamentals of Vibrations.
Week 2	Free Vibrations of undamped Single Degree of Freedom system.
Week 3	Vibrations of systems with Viscous Damping.
Week 4	Forced vibration for undamped and damped system.
Week 5	Response of Damped system under harmonic motion of base and Response of Damped system under Rotating Unbalance.
Week 6	Multi-Degree of freedom system Equation of Motion. Normal Mode Vibration Influence coefficients. Lagrange's Equation
Week 7	MDF Coordinate Coupling. Eigenvalue and Eigenvector. Forced harmonic vibration.
Week 8	Influence coefficients and Lagrange's Equation
Week 9	Determination of Natural Frequency and Modal Shapes: Rayleigh's Method
Week 10	Determination of Natural Frequency and Modal Shapes: Dunkerley's Formula. Holzer's Method
Week 11	Continuous Systems: Transverse Vibration of String.
Week 12	Continuous Systems: Longitudinal Vibrations of rod. Torsional Vibrations of Shafts and Rods
Week 13	Vibration Measurements: Vibration Pickups. Vibration Exciters. Review and discussion
Week 14	Vibration Measurements: Balancing of Rotating Machines.
Week 15	Vibration Measurements: Signal Analysis
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Single Degree of Freedom system (simple pendulum)
Week 2	Lab 2: Single Degree of Freedom system (mass spring system)
Week 3	Lab 3: : Torsional vibration system
Week 4	Lab 4: Torsional vibration system with damping
Week 5	Lab 5: Two degree of freedom system
Week 6	Lab 6: Forced vibration
Week 7	Lab 7: whirling of shafts.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Theory of Vibration with Application, William T. Thomson.	Yes
Recommended Texts	Mechanics of Machines Elementary Theory and Examples, J. H. Hannah and R. C. Stephens.	yes
Websites	https://power-mi.com/content/vibration-analysis-learning	

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.