

**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

2025–2026

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 Architectural Engineering program at Wasit University / College of Engineering offers a comprehensive and diverse curriculum, providing students with a strong foundation in the field of architecture. With a highly experienced and dedicated faculty, the program is designed to equip students with the necessary skills and knowledge to excel in the architectural profession. The program emphasizes a comprehensive approach to architecture, covering various aspects of architectural design, theory, and practice. Students will explore architectural history, design principles, building construction, structural systems, environmental sustainability, and urban design. This holistic approach ensures that students develop a well-rounded understanding of the architectural discipline.

Hands-on Learning: The program integrates practical learning experiences to complement theoretical knowledge. Students will engage in design studios, architectural workshops, and real-world projects. These hands-on experiences provide students with the opportunity to apply their theoretical understanding to practical architectural challenges, fostering creativity, problem-solving skills, and design proficiency.

Collaborative Environment: Architecture is a collaborative field, and the program encourages teamwork and interdisciplinary collaboration. Students will work on group projects, collaborating with peers from disciplines such as engineering, landscape architecture, and interior design. This collaborative approach enhances students' ability to work effectively in multidisciplinary teams, reflecting the real-world practice of architecture.

Career Development: The Architectural Engineering program prepares students for a wide range of career opportunities in the architectural profession. Graduates will be equipped with the necessary skills to pursue careers in architectural firms, urban planning agencies, construction companies, and government organizations. The program also provides guidance and support for internships and professional networking opportunities to enhance students' career prospects.

The Architectural Engineering program at Wasit University / College of Engineering provides students with a comprehensive education in architecture, fostering creativity, critical thinking, and technical proficiency. Graduates will be well-prepared to contribute to the field of architecture and make meaningful contributions to the built environment.

Course Description: In this Module, students will delve into the world of abstract art and master design elements and principles. Through captivating two-dimensional and three-dimensional artwork, they will explore the creative possibilities of abstraction. By analyzing architectural plans and models, students will develop an understanding of spatial relationships and composition, applying these insights to their own artistic decisions. Progressing from monochromatic gradients to the incorporation of colors and textures, they will explore the visual impact and expressive potential of different elements. Going beyond abstract compositions, students will delve into the abstraction of forms, stories, metaphors, or poems, fostering personal interpretation and creative expression. Additionally, they will develop communication and presentation skills to confidently convey architectural ideas both visually and verbally.

Program Vision: Our vision at the Department of Wasit Architecture is to be a leader in architectural education, promoting sustainable and community-focused design practices that enrich the built environment and improve the quality of life for all. We strive to inspire our students to think creatively, critically, and responsibly, and to empower them to become leaders in the field of architecture. With a focus on excellence in teaching, research, and community participation, we aim to shape the future of architecture and create a better world through design.

Program Mission: At the Department of Wasit Architecture, we provide the highest quality education and training in the field of architecture. Our goal is to equip our students and professionals with the skills and knowledge they need to design functional, safe, and aesthetically pleasing buildings that are also sustainable and reflect the needs of the local community. We believe that architecture has the power to shape the world we live in, and we are committed to fostering a love of design and a sense of responsibility to the environment and public health in all of our students. Join us as we strive to create a better built environment for all.

Program Objectives:

1. Providing comprehensive education and training in architecture to students and professionals.
2. Promoting sustainable design practices and raising awareness of their impact.
3. Engaging with the local community to reflect their needs in the design process.
4. Practice professional integrity and competence in performing their duties and responsibilities relative to community building through engineering projects. (PEO 1)
5. Exercise compelling managerial leadership with high regards to effective social communication skills and observing high ethical responsibility in dealing with varying kinds of people in the multidisciplinary field of engineering works, guided by the principles of sustainable development. (PEO 2)
6. Observe the principles of good governance for the benefit of the community as an architectural engineer. Display high regards to the constitutional concept wherein public office is a public trust where accountability is highly observed and respected in serving the community. (PEO 3)
7. Demonstrate a goal to pursue professional development through continuing education, lifelong learning and experiences, keeping up with new engineering trends and innovations, and membership in accredited professional societies. (PEO 4)

8. Provide extensive and workable skills to carry out technical investigations and decision-making designs within the realistic constraints such as economic, environmental, societal, safety and sustainability.(PEO 5)

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

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

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: **Wasit**

Faculty/Institute: **Engineering College**

Scientific Department: **Mechanical Engineering department**

Academic or Professional Program Name: **Mechanical Engineering**

Final Certificate Name: **Mechanical Engineering**

Academic System: **bologna**

Description Preparation Date: **1 / 9 / 2025**

File Completion Date: **1 / 10 / 2025**

Signature:



Head of Department Name:

Asst. Prof. Dr. Hatem Mahmoud Samaka

Date: 25/ 9 /2025

Signature:



Scientific Associate Name:

Asst. Prof. Dr. Mohammed Ghaleb Mohsen

Date: 25/ 9 /2025

The file is checked by:

Director of the Quality

Assurance and University Performance Department:

Asst. Prof. Dr. Haider Majid

Date: 25/ 9 /2025



Approval of the Dean

Prof. Dr. Thaer Saud Al-Ghasham

1. Program Vision

Our vision is Striving for outstanding in education, entrepreneurship and innovation aiming toward a global knowledge hub in the science of mechanical engineering. Providing high-quality education that creates well-qualified graduates with the capabilities to meet the needs of society and contend with future challenges.

2. Program Mission

The Mission of Mechanical Engineering Department has three tends: to achieve the best service related to mechanical engineering leading to a comprehensive understanding in mechanical engineering's science and technology according to the standards of the quality management; graduating well-qualified and innovative mechanical engineers who can significantly contribute to their career and successful in advanced studies; achieving excellence in continuous development and scientific research to provide leadership and innovative solutions to technological challenges.

3. Program Objectives

The formulation of the Vision and Mission mentioned above are translated into the objectives of the Mechanical Engineering Department as follows:

- 1) To become a reliable department of international standards.
- 2) To maintain a high standard of mechanical engineering education through outstanding teaching, innovation, research and training that reflect the changing needs of society.
- 3) To Produce competent graduates in the field of mechanical engineering capable of build up their careers upon a solid foundation of knowledge.
- 4) To increase the number of membership of professional bodies in Mechanical Engineering and develop them.
- 5) To have frequent interaction program with standard domain Industries.
- 6) To pursue excellence in research and technology transfer, especially those based on appropriate technology to improve the quality of people's lives.
- 7) To produce community service activities that are recognized at the national

level to improve the quality of people's lives.

- 8) To increase the public awareness of departmental activities and the Mechanical Engineering profession.
- 9) To attract highly motivated students with enthusiasm, aptitude and interest in mechanical engineering.

4. Program Accreditation

Wasit University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 300, 30 ECTS per semester. 1 ECTS is equivalent to 25 student workload, including structured and unstructured workload.

5. Other external influences

Ministry of Higher Education and Scientific Research

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	8	18	10%	
College Requirements	0	0	0%	
Department Requirements	43	162	90%	
Summer Training	–	–	–	
Other	–	–	–	

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

7. Program Description				
Year/Level	Course Code	Course Name	Credit Hours	
2025–2026			Theoretical	Practical
Level UGI Semester 1,2	MEC001	Statics(1)	3	2
	MEC005	Statics(2)	3	2
	MEC003	Manufacturing Processes and Workshops (1)	2	3
	MEC007	Manufacturing Processes and Workshops (2)	2	3
	MEC004	Electrical Engineering(1)	2	1
	MEC008	Electrical Engineering(2)	2	1
	WU03	Computer 1	1	2
	WU04	Freedom and Human rights	1	1
	MEC0018	Computer programming 1	1	2
	WU01	Arabic Language	1	1
	WU02	English Language (1)	2	2
	WU23	English Language (2)	2	2
	COE01	Mathematics(1)	3	1
	MEC009	Mathematics(2)	3	1
	MEC002	Engineering Drawing and Descriptive Geometry(1)	1	3
	MEC006	Engineering Drawing and Descriptive Geometry(2)	1	3
Level UGI Semester 3,4				
	WU23	Computer Programming (2)	1	2
	MEC0011	Mathematics (3)	3	1
	MEC0017	Mathematics (4)	3	1
	MEC0012	Dynamics (1)	2	1
	MEC0019	Dynamics (2)	2	1
	MEC0022	Mechanical Drawing (1)	1	2
	MEC0023	Mechanical Drawing (2)	1	2
	MEC0016	Strength of Materials (1)	2	2
	MEC0020	Strength of Materials (2)	2	2
	MEC0015	Thermodynamics (1)	2	2
	MEC0021	Thermodynamics (2)	2	2
	MEC0014	Fluid Mechanics (1)	2	2
	MEC0024	Fluid Mechanics (2)	2	2
	MEC0025	Engineering Metallurgy (1)	2	1
	MEC0013	Engineering Metallurgy (2)	2	1
	MEC3302	Design of Machine Elements (1)	2	1
	MEC3303	Design of Machine Elements (2)	2	1
	MEC3304	Theory of Machines (1)	2	2

Level UGI Semester 5,6	MEC3305	Theory of Machines (2)	2	2
	MEC3306	Internal Combustion Engines (1)	2	2
	MEC3307	Internal Combustion Engines (2)	2	2
	MEC3308	Heat Transfer (1)	2	2
	MEC3309	Heat Transfer (2)	2	2
	MEC3310	Gas Dynamics	2	2
	MEC3313	Engineering Analysis	2	1
	MEC3313	Numerical Analysis	2	3
	MEC3314	Manufacturing Processes(Traditional)	2	0
	MEC3315	Manufacturing Processes (non-Traditional)	2	0
	MEC3316	Computer Aided Engineering (1)	1	2
	MEC3317	Computer Aided Engineering (2)	1	2
	MEC3318	Electrical Machines	2	0

8. Expected learning outcomes of the program

Knowledge

Providing graduates with the necessary scientific and social knowledge that enables them to practice their profession. It relies on [Bloom's method](#) of knowledge to provide students with information, starting with [\(Knowledge and Comprehension, followed by application and analysis, then synthesis and assembly, and finally evaluation\)](#). It also provides students with the ability to distinguish between engineering problems, identify them, and work to solve them by applying the principles of engineering, science, and mathematics. It also provides students with the ability to produce engineering designs that meet the required needs through engineering application and that are consistent with the standards of the Iraqi Council for Accreditation of Engineering Education, which begins with the cognitive aspect represented by the ability to design systems and conduct testing and analysis. Thereby, the department's cognitive objectives include:

- 1) Developing the ability to perform engineering analysis and scientific thinking by applying engineering information within an administrative and scientific organizational framework to solve, evaluate, and interpret an engineering problem
- 2) Providing students with familiarity with standard mechanical engineering standards, assessing market needs, applying quality management concepts in engineering work, and acquiring information technology skill
- 3) Enabling students to understand engineering concepts and prepare them for self-learning and the acquisition of new technologies and skills in the field of engineering
- 4) Employing cognitive skills in social life and the ability to work in diverse

environments

- 5) Providing students with the ability to use scientific thinking to determine the relationship between mechanical engineering and other sciences.

Skills

To integrate the knowledge with the application, graduates need to acquire the skills specific to their field of work. This can be achieved by acquiring the modern skills necessary to create and implement appropriate measurements and tests with quality assurance, analyze and interpret results, and use engineering judgment to reach conclusions. The Department of Mechanical Engineering seeks to equip graduates with the necessary skills according to the skills classification, which includes the ability to simulate work, flexibility and diversity of ideas, and precision in implementation. This also aligns with the standards of the Iraqi Council for Accreditation of Engineering Education, which include skills in communicating with others, teamwork, and applying new knowledge to solve problems. The program's specific skill objectives include:

- 1) Measurement and evaluation skills
- 2) Academic program management and organization skills
- 3) Academic learning and teaching skills
- 4) Discussion, dialogue, and collaborative learning through group work
- 5) The ability to select and conduct required tests and collect, compare, and analyze test results.

Ethics

The Department of Mechanical Engineering emphasizes educating graduates to always adhere to professional ethics and responsibility at work. They must understand ethical and professional responsibilities in engineering matters, taking into account the consequences of engineering, financial, and societal considerations. The Department of Mechanical Engineering is dedicated to instilling in graduates the necessary ethics and values through receiving, responding, evaluating, organizing, and describing the application of engineering and societal values.

9. Teaching and Learning Strategies

The Mechanical Engineering program relies on multiple teaching, learning, and

assessment strategies to ensure students achieve their graduation outcomes. Our educational strategies include active participation in continuing professional development and the development of new knowledge and skills to pursue new career opportunities. We also work to update and adapt our students' basic knowledge and abilities. Learning outcomes are verified through various student tests: theoretical and practical, daily, semester, and annual. Students are also assigned reports on the subjects they study and laboratory reports. Furthermore, a graduation project is prepared during the fourth academic year, testing the student's acquired scientific and practical skills. Oral presentations are required for some courses, and these assessments are essential for students' progression from one academic year to the next and ultimately for graduation.

- Questioning, discussion, report preparation, and group work in workshops.
- Student assignments include a graduation project that describes an engineering problem, analyzes information, diagnoses the problem, and describes a solution.
- Working with other government institutions within the summer training program.
- Organizing field visits to the field to motivate students to learn and study further.
- Methods of presentation, questioning, and discussion.
- Preparing laboratory and theoretical scientific reports.
- Solving practical questions and assignments related to mechanical engineering.
- Summer training.

10. Evaluation methods

In general, assessment is conducted through blended learning using a variety of methods, including self-study, exams, quizzes, follow-up homework, reports, oral presentations and discussions, summer training, scientific visits, experimental tests, and the graduation project, as follows:

- 1) Course assessment: through assignments, reports, essays, and short projects to measure understanding of theory and applications.
- 2) Examinations: Written mid-term and final exams to assess theoretical and technical knowledge.
- 3) Practical and laboratory work: workshops, experiments, and model-building are assessed to test applied skills.
- 4) Group projects and teamwork: collaborative projects are assessed to measure

teamwork and leadership.

- 5) Oral presentations and discussions: through individual or group presentations to measure communication and critical thinking skills.
- 6) Field and professional training assessment: through practical experience and feedback from supervisors.
- 7) Graduation project/final thesis: a comprehensive assessment of research, design ability, innovation, and professional readiness.

11. Faculty

Faculty Members

Names and Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Prof. Dr. Zeina Khalifa Kazim	Mechanical Engineering	Thermal			*	
Prof. Dr. Ali Abdulredha Farhan	Mechanical Engineering	Thermal			*	
Prof. Dr. Abbas Jassim Jubair	Mechanical Engineering	Thermal			*	
Assistant Professor Hadi Obaid Bishr	Mechanical Engineering	Fluids			*	
Assistant Professor Hussein Razaq Sabah	Mechanical Engineering	Applied			*	
Assistant Professor Alaa Rahma Kazim	Mechanical Engineering	Thermal			*	
Assistant Professor Azzam Sabah Hamid	Production Engineering	Production			*	
Assistant Professor Batool Mardan Faisal	Mechanical Engineering	Applied			*	
Assistant Professor Farouk Omar Hamdoun	Mechanical Engineering	Applied			*	
Assistant Professor Abdulsalam Dawood Mohammed	Mechanical Engineering	Thermal			*	
Assistant Professor Hatem Mahmoud Samaka	Mechanical Engineering	Applied			*	
Assistant Professor Mohammed Ghaleb Mohsen	Mechanical Engineering	Thermal			*	

Assistant Professor Hussein Kamar Mahmoud	Mechanical Engineering	Materials			*	
Assistant Professor Anwar Juma Ahmed	Materials Engineering	Applied			*	
Assistant Professor Ammar Dawood Ghali	Mechanical Engineering	Applied			*	
Assistant Professor Amer Ghazi Haws	Mechanical Engineering	Materials			*	
Assistant Professor Raghdan Mohsen Namous	Mechanical Engineering	Thermal			*	
Assistant Professor Radwan Mohammed Adai	Mechanical Engineering	Thermal			*	
Assistant Professor Ahmed Abdulredha Yassin	Production Engineering	Applied			*	
Prof. Dr. Zeina Khalifa Kazim	Mechanical Engineering	Applied			*	
Assistant Professor Ali Faraj Hammadi	Mechanical Engineering	Materials			*	
Assistant Professor Mohammed Hussein Radhi	Mechanical Engineering	Thermal			*	
Assistant Professor Kazem Hussein Makhamesh	Mechanical Engineering	Thermal			*	
Assistant Professor Amna Hamoud Dayef	Mechanical Engineering	Applied			*	
Assistant Professor Haider Mahmoud Rahima	Mechanical Engineering	Thermal			*	
Assistant Professor Haider Karim Masraa	Mechanical Engineering	Applied			*	
Assistant Professor Nihad Kazem Farhan	Mechanical Engineering	Thermal			*	
Assistant Professor Khalil Salim Jabr	Mechanical Engineering	Thermal			*	
Assistant Professor Abdul Amir Tariq Abbas	Mechanical Engineering	Thermal			*	

Professional Development

Mentoring new faculty members

1. Orientation and Integration

- Providing structured orientation programs for new faculty members, covering curriculum, teaching strategies, assessment methods, and institutional policies.
- Pairing new faculty members with experienced professors to mentor them during their first year.

2. Teaching Support

- Encouraging classroom observation and feedback sessions in collaboration

with senior professors.

- Sharing best practices in teaching methods, student engagement, and the use of technology in education.

3. Research

- Supporting new faculty members in developing research agendas aligned with departmental priorities.
- Assisting their mentors with publishing strategies, writing grant applications, and building networks within academic communities.

Professional development of faculty members

- Professional **Ethics and Responsibilities**
- Emphasize academic integrity, professional ethics, and responsibilities toward students and colleagues.
- Provide role-modeling in handling challenges in teaching, advising, and service.
- Career **and Leadership Development**
- Guide new faculty in long-term career planning, including promotion and tenure pathways.
- Offer workshops on leadership skills, project management, and community engagement.

12. Acceptance Criterion

(Setting regulations related to enrollment in the college or institute, whether central admission or others)

13. The most important sources of information about the program

1. University Publications – Official academic catalogues, program specification documents, and student handbooks issued by Wasit University / College of Engineering.
2. Departmental Resources – Curriculum guides, course syllabi, and orientation materials provided by the Mechanical Engineering Department.
3. Faculty Guidance – Information and advice offered directly by program coordinators, faculty members, and academic advisors.
4. Institutional Platforms – University website, e-learning platforms, and digital repositories containing policies, announcements, and learning resources.
5. Professional and External References – Engineering standards, and professional organizations that complement academic learning.

14. Program Development Plan

1. Curriculum Review and Enhancement
 - Regular evaluation of courses to ensure alignment with international standards and market needs.
 - Integration of new technologies such as BIM, digital design, and sustainability practices.
2. Faculty Development
 - Continuous training, research support, and mentoring for new faculty members.
 - Encouragement of international collaboration and participation in academic conferences.
3. Infrastructure and Learning Resources
 - Upgrading laboratories, studios, and digital platforms to enhance hands-on learning.
 - Expanding access to online databases, libraries, and engineering software.
4. Industry and Community Engagement
 - Strengthening partnerships with engineering firms, planning agencies, and government institutions.
 - Expanding internship and field-training opportunities for students.
5. Quality Assurance and Accreditation
 - Continuous monitoring of learning outcomes, assessment methods, and graduate feedback.
 - Preparing for national and international accreditation processes.
6. Research and Innovation Development
 - Supporting student and faculty research in sustainable engineering and digital innovation.
 - Establishing specialized research groups and centers.

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
Level UGI Semester 1,2	MEC001	Statics(1)	C	*					*						
	MEC005	Statics(2)	C	*					*				*		
	MEC003	Manufacturig Processes and Workshops (1)	C		*			*							*
	MEC007	Manufacturig Processes and Workshops (2)	C		*			*							*
	MEC004	Electrical Engineering(1)	C				*			*		*			
	MEC008	Electrical Engineering(2)	C				*			*		*			
	WU03	Computer 1	B			*			*			*			

	WU04	Freedom and Human rights	B			*				*					*
	WU01	Arabic Language	B		*				*			*			
	WU02	English Language (1)	B		*				*			*			
	WU23	English Language (2)	B		*				*			*			
	COE01	Mathematics(1)	C		*				*			*			
	MEC009	Mathematics(2)	C		*				*			*			
	MEC002	Engineering Drawing and Descriptive Geometry(1)	C	*					*						
	MEC006	Engineering Drawing and Descriptive Geometry(2)	C	*					*						

Level UGI Semester 3,4	MEC0010	Computer Programming (2)	C		*					*					*
	WU22	Computer (2)	C		*					*					*
	MEC001	Mathematics (3)	C	*					*			*	*		
	MEC0017	Mathematics (4)	C	*					*			*	*		
	MEC0012	Dynamics (1)	C		*			*	*			*			
	MEC0019	Dynamics (2)	C		*			*	*			*			
	MEC0022	Mechanical Drawing (1)	C			*			*				*		
	MEC0023	Mechanical Drawing (2)	C			*			*				*		
	MEC0016	Strength of Materials (1)	C	*				*						*	
	C0020	Strength of Materials (2)	C	*				*						*	

	MEC0015	Thermodynamics (1)	C		*					*					*
	MEC0021	Thermodynamics (2)	C		*					*					*
	MEC0014	Fluid Mechanics (1)	C		*				*			*			
	MEC0024	Fluid Mechanics (2)	C		*				*			*			
	MEC0013	Engineering Metallurgy (1)	C			*			*			*			
	MEC0025	Engineering Metallurgy (2)	C			*			*			*			
Level UGI Semester 5,6	MEC3302	Design of Machine Elements (1)	C	*					*			*			
	MEC3303	Design of Machine Elements (2)	C	*					*			*			
	MEC3304	Theory of Machines (1)	C		*				*						*

	MEC3305	Theory of Machines (2)	C		*				*						*
	ME3306	Internal Combustion Engines (1)	C	*						*		*			
	MEC3307	Internal Combustion Engines (2)	C	*						*		*			
	MEC3308	Heat Transfer (1)	C			*			*		*		*		
	MEC3309	Heat Transfer (2)	C			*			*		*		*		
	MEC3310	Gas Dynamics	C	*				*	*				*	*	
	MEC3311	Fluid Mechanics 3	C	*	*				*				*	*	
	MEC3312	Engineering Analysis	C			*	*	*							*
	MEC3313	Numerical Analysis	C				*				*			*	

	MEC3314	Manufacturing Processes (Traditional)	C			*	*	*	*				*	*	
	MEC3315	Manufacturing Processes (Non-Traditional)	C			*	*	*	*				*	*	
	MEC3316	Computer Aided Engineering (1)	C			*			*				*		
	MEC3317	Computer Aided Engineering (2)	C			*			*				*		
	MEC3317	Electrical Machines	C							*		*			

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

Course Description Form

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Mechanics: Statics 1		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة
Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	MEC001		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	One
Administering Department	Mechanical	College	Engineering
Module Leader	م.د. رضوان محمد عداي	e-mail	raddai@uowasit.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	PhD
Module Tutor	م.د. رضوان محمد عداي	e-mail	raddai@uowasit.edu.iq
Peer Reviewer Name	ا م د انور جمعة احمد	e-mail	aalobaidi@uowasit.edu.iq
Scientific Committee Approval Date	25-6-2023	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Realizing the importance of studying the science of statics, and in particular identifying the controlling and affecting forces on mechanical systems in particular. 2. To develop problem solving skills and understanding of the vector form. 3. Understand the force system, then compute the resultant force. 4. To calculate the moment about a point or axis. 5. The practical side pushes the student to more understanding and comprehension of the static material and calculating what is required manually. 6. Encourage the student to understand physical issues, analyse forces, and draw the imaginary free body, and create a moral motivation for the student to design, manufacture, and innovate. 7. Motivate students to do imaginative and descriptive work. 8. To develop skills of searching and acquiring information. 9. Deal with analysis and calculation of data. 10. To develop skills of reasoning and production. 11. Increasing the student's geometric and imaginative sense and using geometric and descriptive drawing to solve some problems
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. List various terms associated with Engineering mechanics subjects. 2. Define the vector and scalar quantities. 3. Summarize what is meant by displacement and distance. 4. Discuss the relation between the vector form and the force system. 5. Describe the properties of vectors and unit vector. 6. Define Newton's laws. 7. Identify the force system and its forms. 8. Compute the resultant force of a system. 9. Explain and calculate the moment in 2D and 3D.
Indicative Contents المحتويات الإرشادية	Introduction and definitions- An introduction to some physical terms and the definition of statics. [3hrs] Vector and scalar quantities- Diagnosing the difference between vector and scalar quantities due to the importance of these quantities in understanding statics. [8hrs] Revision problems in the class. [4hrs] Newton's laws- Define and explain the three famous rules that indicated by sir Isac Newton. [4hrs] Revision problems in the class. [4hrs] Force system- Define force and calculate the resultant force in a system. Moreover, understanding the 3D force analysis. [16hrs] Revision problems in the class. [4hrs] Moments- Calculation of moments in 2D and 3D axes and understanding of the vertical arm. [16hrs] Revision problems in the class. [4hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	According to the prescribed curriculum using face-to-face education with the use of e-learning methods, by giving lectures via Google meet with a video presentation of the lecture through the Google Classroom application. As for the methods of evaluation, relying on the method of discussion and questions and answers during the lecture time, as well as relying on homework and oral questions during the electronic class.
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	An introduction to some physical terms and the definition of statics.
Week 2	Identify the difference between vector and scalar quantities due to the importance of these quantities in understanding statics + tutorial
Week 3	Explain the vector and discuss its properties in more details+ tutorial
Week 4	Define the unit vector + tutorial
Week 5	Explain the dot and cross product+ tutorial
Week 6	Define the force in general and present the Newton's laws.
Week 7	Explain the force system+ tutorial
Week 8	Explain the force system forms + tutorial
Week 9	Understanding the analysis of the forces oblique in the two directions
Week 10	Reducing 2D forces to a single force equivalent
Week 11	Understanding the analysis of the forces oblique in the three directions+ tutorial
Week 12	Reducing 3D forces to a single force equivalent +tutorial
Week 13	Mid-term Exam + Define and calculate the moment in 2D and understanding of the vertical arm +tutorial
Week 14	Calculation of moment in 3D +tutorial
Week 15	Course subjects review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Verification of parallelogram law of forces
Week 2	Lab 2: Verification of triangle law of forces
Week 3	Lab 3: Verification of support reactions of a simply supported beam
Week 4	Lab 4: Verification of the principle of moments using the bell crank lever apparatus
Week 5	Lab 5: Verification of a system of forces in equilibrium
Week 6	Lab 6: Determination of coefficient of friction between two surfaces
Week 7	Lab 7: Final lab exam

Code	Course/Module Title	ECTS	Semester
	Engineering Mechanics: Statics 1	6	One
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	5	72	78

Description

This course enables students to review some physics terms related to engineering mechanics - statics - and then learn the difference between vector and scalar physical quantities. In addition, students can know how to analyze the issue of mechanical systems and obtaining a basic understanding of the subject of forces and force analysis.

Module Information					
معلومات المادة الدراسية					
Module Title	Manufacturig Processes and Workshops 1		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC003				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGI	Semester of Delivery		One
Administering Department		Mechanical	College	Engineering	
Module Leader	م.د. عمار داود غالي		e-mail	ammardawood@uowasit.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name		ا م د عزام صباح حميد	e-mail	azzam@uowasit.edu.iq	
Scientific Committee Approval Date		25-6-2023	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1) Familiarizing students with the basics of various manufacturing processes, as a first step in preparing an efficient engineer who can produce various products in an optimal way. 2) Encouraging students to do scientific research to expand their engineering knowledge in modern manufacturing processes. 3) Studying the production of metallic and non-metallic materials 4) Study the properties, classification, and tests of engineering materials 5) Study and apply casting and welding processes 6) Study and apply forming and machining processes
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1) Understanding the importance of studying various manufacturing processes 2) Developing the skill of acquiring information, analysis of production processes 3) The student will be familiar with the basic concepts of the work of various machines (lathe, milling, and other machines in the workshops) 4) Training the student to apply the foundations and concepts he studied theoretically in work life 5) Introducing students about the factories environment and how to distribute machines in workshops and production lines. 6) The student is introduced to the periodic and emergency maintenance of the machines to avoid work risks.

Indicative Contents المحتويات الإرشادية	1) Knowing the importance of studying the various manufacturing processes in the practical and industrial aspects. 2) Knowledge of the role of design and developing in the quality and efficiency of the production process 3) Giving the student the confidence to participate in the production and manufacturing of product. 4) Providing the student with an applied skill for production machines 5) Knowing the main problems in the workshops and developing an optimal solution in the work environment 6) The student acquires some skills of managing productive workshops. 7) Provide the student with a spirit of caring for the machine and cooperating with colleagues to achieve the best results.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in this unit is to introducing the basic knowledge of the manufacturing processes, including interrelationships between the properties of the material, the manufacturing process and the design of components. Also, providing students with an overview of a wide variety of manufacturing processes. Thus, providing sufficient knowledge for the essential manufacturing processes as the first step to be an efficient engineer that can produce products in an optimal way. This can be achieved through classrooms and interactive educational programs in workshops and laboratories, and to raise intellectual questions through lectures and discussions by connect the topics of the lecture with the
	work environment in practical workshops. As well as encouraging students to participate in practical exercises in workshops and laboratories, while improving students' critical thinking skills and linking them with machines, tools, and manufactured parts in their daily lives.

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material covered
Week 1	Introduction to the Manufacturing Processes (Define ,Used ,Types)
Week 2	Engineering Material and Production Cycle
Week 3	Production of Metallic Material
Week 4	Ores and Production of Steel and Cast Iron

Week 5	The Furnaces Used for Steel Production
Week 6	Iron-carbon phase diagram
Week 7	Ores and Production of (Copper, Lead, Aluminum)
Week 8	Crystal Structure for Metals and Alloys
Week 9	Deformation in metallic crystals (plastically and elastically)
Week 10	Engineering Material properties and mechanical tests
Week 11	Tensile and Compression tests
Week 12	Strain-stress relationships
Week 13	Bending , Hardness, and impact tests
Week 14	Sand Casting
Week 15	Die Casting and Centrifugal casting
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Turning workshop
Week 2	Lab 2: Turning workshop
Week 3	Lab 3: Welding workshop
Week 4	Lab 4: Welding workshop
Week 5	Lab 5: Casting workshop
Week 6	Lab 6: Casting workshop
Week 7	Lab 7: Electricity workshop

Code	Course/Module Title	ECTS	Semester
	Manufacturing Processes and Workshops 1	5	One
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	6	93	32
Description			
The subject of manufacturing processes and workshops are the basic subjects that directly related to daily used product. This course addressing the different types of manufacturing methods and production processes for various engineering materials and geometric shapes. Moreover, joining and welding or assembly methods of parts. Therefore, acquainting students with sufficient knowledge of basic manufacturing processes is considered as a first step to preparing an efficient engineer who can produce various products in an optimal way. The course includes the theoretical side of analyzing the types and importance of production methods, in addition to the practical side in the workshops, thus providing the student with the skill of analysis and practical application. It also encourages students to research and develop modern manufacturing processes.			

Module Information				
معلومات المادة الدراسية				
Module Title	Electrical Engineering1		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة	
Module Type			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	ME004			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	UGI	Semester of Delivery		One
Administering Department	Mechanical	College	Engineering	
Module Leader	م م رند جعفر		e-mail	rjudoou@uowasit.edu.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	Msc
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	25-9-2025		Version Number	1.0
Module Aims, Learning Outcomes and Indicative Contents				
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية				
Module Aims أهداف المادة الدراسية	1. Introducing the basic principles of electrical circuits 2. To understand voltage, current and power from a given circuit. 3. Study of direct current and methods of connecting electric circuits in series, parallel, delta & star 4. Find current and voltage using <u>methods</u> : mesh, nodal, superposition, the venin ,Norton and max. power transfer.			
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. Summarize what is meant by a basic electric circuit. 3. Describe electrical power, charge, and current. 4. Define Ohm's law. 5. Identify the basic circuit elements and their applications. 6. Explain the two Kirchhoff's laws used in circuit analysis. 7. The student learned about the methods of connecting electrical circuits and how to find current and voltage theoretically and practically. 8. Explain the theorems of electrical <u>circuits</u>(mesh, nodal, superposition ,the venin, Norton and max. power transfer).			

Indicative Contents المحتويات الإرشادية	1. Current and voltage definitions 2. Resistance and effect of temperature on a resistance. 3. Ohm's law and Kirchhoff's laws 4. Combining resistive elements in series and parallel 5. Network reduction 6. Introduction to mesh and nodal analysis. 7. Network theorems 8. AC Fundamentals (Average and RMS values), Representation A.C
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Giving theoretical lectures directly in the classroom. 2- Laboratory lessons and many workshops to solve a specific problem. 3- Reports and studies. 4- Using clarification tools and uploading video lectures on the Google Classroom platform. 5- Direct discussion by asking questions and opening the door for
	dialogue and interaction with students 6- Developing and enhancing the student's thinking skill and moving him to a higher level of thinking 7- Raising the spirit of cooperation and working within a team 8- Bringing out creative ideas among students by raising the spirit of competition Encouraging learners to ask a lot of questions is an effective teaching strategy that does not only motivate students to think more practically but also helps them to become independent learners.

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	basic of electrical engineering, Temperature effect of a resistance,
Week 2	Ohm's law , Series circuits, (quiz1)
Week 3	parallel circuits & (series-parallel circuits)
Week 4	<u>kirchhoff's</u> voltage law& voltage divider rule (quiz2)
Week 5	<u>kirchhoff's</u> current law& current divider rule,
Week 6	Current source, Source conversions _delta to star & star to delta connection
Week 7	Midexam1
Week 8	Mesh analysis
Week 9	Nodal analysis
Week 10	Superposition (quiz3)
Week 11	<u>thevenin</u> theorems
Week 12	Norton & max. power transfer theorems,
Week 13	Receiving report and discussion
Week 14	Sinusoidal alternating waveforms
Week 15	average value & <u>rms</u> value
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Power supply & Digital <u>multimeter</u> definition A1
Week 2	Lab 2: Power supply & Digital <u>multimeter</u> definition A2
Week 3	Lab 3: Ohm's Law experiment , Receiving report1 A1 & discussion
Week 4	Lab 4: Ohm's Law experiment , Receiving report1 A2 & discussion
Week 5	Lab 5: Receiving report2 A1 , discussion & Exam
Week 6	Lab 6: Receiving report2 A2 , discussion & Exam
Week 7	Lab 7: equivalent Resistance experiment,A1
Week 8	Lab 8: equivalent Resistance experiment, A2

Week 9	Lab 9: Receiving report3 A1 , discussion & Exam
Week 10	Lab10: Receiving report3 A2 , discussion & Exam
Week 11	Lab 11: Kirchhoff's Law experiment A1
Week 12	Lab 12: Kirchhoff's Law experiment A2
Week 13	Lab 13: Receiving report4 A1 , discussion & Exam
Week 14	Lab14: Receiving report4 A2 , discussion & Exam
Week 15	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Electrical Engineering1	3	One
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	3	48	27

Description

Circuit analysis is the process of finding all the currents and voltages in a network of connected components. We look at the basic elements used to build circuits, and find out what happens when elements are connected together into a circuit.

Our modern world relies on technology built thanks to electrical engineering and circuitry. Circuit analysis is one of the most important aspects of understanding how these technologies work. The process of circuit analysis involves studying various electrical quantities in the different components.

Completing a circuit analysis requires us to gather some information and utilize some equations. There are four things that you will need to know in particular about any circuit you are attempting to analyze. The tools are as follows:

1. You will have to know the **schematics** of the circuit. Knowing what the circuit looks like on paper will make it a lot easier for you to calculate and record certain values at certain points around the circuit. The best way to do this is to draw a **circuit diagram**, including every component.
2. Once you have a schematic of your circuit, you are going to want to simplify **all the** resistors down into one resistor. That means, any resistor, no matter if it is in series or parallel, should be placed into the value of a single resistor in series with the rest of the circuit.

3. You will need to know some fundamental equations and laws of physics.
4. Finally, you'll have to know Kirchhoff's current and voltage laws. These are laws that explain how current and voltage work in different types of circuits.

It should also be noted that in real-life applications, you will need a voltmeter and an ammeter, to measure the voltage and current, respectively. Once the voltage and current are known, every other value can then be calculated.

Module Information			
معلومات المادة الدراسية			
Module Title	Computer 1		Module Delivery
Module Type	Basic		☒ Theory Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar ☐
Module Code	WU03		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGI	Semester of Delivery	One
Administering Department	WAR	College	College of Engineering
Module Leader	Nhad K. Frhan Al-Abboodi	e-mail	nkadhum@uowasit.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	PH.D
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة

الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Giving the student a general idea of computer material at a study environment, library, and at home. 2. Understanding the basic rules for dealing with and managing computers (computer basics, computer components, computer and software licenses, operating systems,), With the aim of preparing the student to enter the programs he needs in the department. 3. Giving the student knowledge about the office applications as basic principles for students in the College of Engineering. 4. Providing a sufficient introduction on the programming concepts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowing computer peripherals, their connections and Windows system. 2. Distinguish between the important tabs in the Word program. 3. The ability to write an entire paragraph with formatting. 4. Understand the basics of power point program. 5. Understand the excel sheet program. 6. Understanding the concepts of programming
Indicative Contents المحتويات الإرشادية	Part A (9 hr) Introduction to computer principles and main operating system. Part B(9 hr) MS Word software, introduction , main menus, commands and additional tasks Part C (6 hr) MS Power Point program, introduction , main menus, commands and additional tasks. Part D (9 hr) MS Excel program, introduction , main menus, commands and additional tasks Part E (8 hr) Introduction to the programing

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	1. Using computers and display screens to explain lectures to students to increase students' mental comprehension. 2. Practical application in the computer lab of what was explained in the theoretical lecture. 3. Using direct questions in the classroom as brainstorming skills. 4. Encouraging students to solve class and homework assignments and to perform specialized reports.

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Computer Fundamentals, computer components, computer Safety, and software Licenses
Week 2	Main Operating systems
Week 3	Additional tasks in operating system
Week 4	Introduction to Microsoft word, exploration of main menus
Week 5	Additional tasks in Ms Word Cont.
Week 6	Additional tasks in Ms Word Cont.
Week 7	Mid-term exam
Week 8	Introduction to Microsoft Power Point
Week 9	Insert Objects and Add Animations in Microsoft Power Point
Week 10	Introduction to Microsoft Excel
Week 11	Additional Tasks in Microsoft Excel.
Week 12	Additional Tasks in Microsoft Excel. Cont.
Week 13	Introduction to programming
Week 14	Additional Tasks in programing
Week 15	Review and a preparatory week before the Final Exam
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Computer Fundamentals.
Week 2	Introduction to Microsoft word, Insert Objects to Microsoft word
Week 3	Insert Objects to Microsoft word
Week 4	Additional Tasks in Microsoft word
Week 5	Introduction to Microsoft Excel
Week 6	Insert Objects to Microsoft Excel

Week 7	Additional Tasks in Microsoft Excel
Week 8	Introduction to Microsoft Power Point
Week 9	Additional Tasks in Microsoft Power Point
Week 10	Additional Tasks in Microsoft Power Point
Week 11	Introduction to Microsoft Excel
Week 12	Additional Tasks in Microsoft Excel.
Week 13	Introduction Tasks in programing
Week 14	Additional Tasks in programing

Module Information					
معلومات المادة الدراسية					
Module Title	English 2		Module Delivery		
Module Type	B		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	WU23				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		UGII			Semester of Delivery
Administering Department		Mechanical	College	Engineering	
Module Leader	Karrar Kadhim Khlaif		e-mail	Karrar.kadhim@uowasit.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		Ph.D
Module Tutor	Karrar Kadhim Khlaif		e-mail	Karrar.kadhim@uowasit.edu.iq	
Peer Reviewer Name		ام د محمد حسين راضي	e-mail	mradhi@uowasit.edu.iq	
Scientific Committee Approval Date		30/1/2025	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The primary goal of an English class is to enhance students' proficiency in reading, writing, speaking, and listening in this class. This involves expanding vocabulary, mastering grammar, and developing effective communication skills that are essential for academic and professional success. Additionally, the class aims to foster critical thinking and analytical skills through the exploration of diverse literature and texts, encouraging students to engage with different cultural perspectives. Ultimately, an English class seeks to create a supportive

	environment where students can express themselves creatively, build confidence in their language abilities, and prepare for future opportunities.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understanding and Demonstrating English Tenses: Students will efficiently grasp and use various English tenses in both spoken and written communication. 2- Essay Writing: Students will develop the ability to write coherent and structured essays, effectively presenting their ideas and arguments. 3- Improvement in Using Conjunctions: Students will enhance their understanding and application of conjunctions to create more complex and fluid sentences. 4- Effective Email Writing: Students will learn to compose professional and clear emails that convey their messages appropriately and effectively. 5- Reading Comprehension: Students will improve their ability to read and comprehend paragraphs, identifying key ideas and details to enhance their understanding of texts. By achieving these outcomes, students will strengthen their overall English language proficiency and communication skills.
Indicative Contents المحتويات الإرشادية	20 hrs : Reading Skills 10 hrs : Writing Skills 10 hrs : Listening Skills 10 hrs : Speaking Skills

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Reading: Engage with pre-intermediate articles on general topics to improve reading comprehension and vocabulary. Writing: Practice writing informal emails to classmates about group work, submitting assignments to lecturers, and creating presentation slides to enhance clarity in communication. Listening: Develop listening skills by working with authentic beginner-level audio materials, helping students adapt to various accents and contexts. Speaking: Discuss self-selected topics related to group projects with classmates, promoting collaboration and practical application of language skills. Vocabulary: Focus on thematic units such as "The World Around Us," covering countries, nationalities, languages, and weather to contextualize vocabulary learning. *Grammar*: Address essential grammar points, including present simple, past simple, present continuous, question forms, and more, allowing students to choose topics for discussion based on their writing needs
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50
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Delivery Plan (Weekly Syllabus) المناهج الاسبوعي النظري	
	Material Covered
Week 1	Review
Week 2	Present Tenses (Simple, Continuous, Perfect)
Week 3	Past Tenses (Simple, Continuous, Perfect)
Week 4	Tenses (Simple, Continuous, Perfect) + Mixed Tenses Practice (Review & Usage in Conversations)
Week 5	Tenses + Articles (A, An, The) and Conjunctions (Connecting Words)
Week 6	Question Words (Who, What, Where, When, How, etc.)
Week 7	Passive Voice vs. Active Voice
Week 8	Modal Verbs (Can, Should, Must)
Week 9	Midterm Exam
Week 10	General Requirements of Writing
Week 11	Writing Essay
Week 12	Writing Official Emails
Week 13	Reading (summarizing the articles)
Week 14	Personal Writing
Week 15	Writing introductions in academic papers

Code	Course/Module Title	ECTS	Semester
WU23	English 2	2	Four
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	2	33	17
Description			
The primary goal of an English class is to enhance students' proficiency in reading, writing, speaking, and listening in this class. This involves expanding vocabulary, mastering grammar, and developing effective communication skills that are essential for academic and professional success. Also, will encourage students to become independent learners.			

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Drawing and Descriptive Geometry (1)		Module Delivery		
Module Type	C		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC0022				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGI	Semester of Delivery		Four
Administering Department		Mechanical	College	Engineering	
Module Leader	Asst.Prof.Dr. Hatam M. Samaka		e-mail	hsamaka@uowasit.edu.iq	
Module Leader’s Acad. Title		Assistant Professor	Module Leader’s Qualification		PhD
Module Tutor	Dr. Waseem Alwan Zaboon		e-mail	Waseem.Alwan@uowasit.edu.iq	
Peer Reviewer Name		Assis.Prof. Hussein Dalfi	e-mail	hqumar@uowasit.edu.iq	
Scientific Committee Approval Date		27 /1/2025	Version Number		1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	- Teaching the student the basics of mechanical drawing rules - Training the student on how to draw mechanical parts used in machines and devices - Training the student on how to assemble mechanical parts to form a machine or mechanical system
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Find a student who has the ability to draw, assemble and disassemble mechanical parts. - Ability to read mechanical drawing symbols and know their meanings and where to use them - Developing the ability to imagine the projections and sections of mechanical bodies - Developing students' abilities regarding the assembly and disassembly of mechanical parts - Preparing technical reports and skills to communicate with others and instilling the work spirit through working as a team
Indicative Contents	mechanical drawing

المحتويات الإرشادية	
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Encourage students to read sources on mechanical drawing. 2. Encouraging students to learn drawing skills using international educational videos 3. Follow up on students in the classroom (study room) to detect and correct errors. 4. Conducting quick and thoughtful tests to know the level reached by students and try to improve 5. Preparing class and homework assignments to strengthen students' skills

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Classification of screws
Week 2	Hexagon screws
Week 3	Joining by bolts or screws
Week 4	Classification of Keys
Week 5	Classification of pins and rivets
Week 6	Surface finishing
Week 7	Tolerances
Week 8	Fits, Classification of fit, clearance, Transition
Week 9	Fits, Interference, calculation of fits and tolerance
Week 10	Welding
Week 11	Welding

Week 12	Gears , Spur Gear
Week 13	Gears , Spur Gear
Week 14	Assembly Drawing
Week 15	Assembly Drawing

Code	Course/Module Title	ECTS	Semester
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
Description			
The purpose of this module is to develop students' linguistic ability by focusing on the key skills of reading, writing, speaking and listening, to encourage students to become independent learners and to introduce them to strategies and skills to enable them to cope with the demands, both academic and cultural, of undergraduate study in an English-speaking environment.			

Module Information					
معلومات المادة الدراسية					
Module Title	Mathematics 4		Module Delivery الرجاء الاستفادة من الجدول اخر صفحة		
Module Type	C		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC0017				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII	Semester of Delivery		Four
Administering Department		Mechanical	College	Engineering	
Module Leader	م د حيدر كريم مصراع		e-mail	haiderkareem@uowasit.edu.iq	
Module Leader’s Acad. Title		Lecturer	Module Leader’s Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		20-1-2025	Version Number	1.0	

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 processes undertaken to arrive at a suitable mathematical model. 2- To teach the fundamental analytical techniques and computational methods used to develop insight into system behaviour. 3- Apply mathematical methodologies to a range (industrial, biological and environmental) of problems, associated conceptual models and their solutions. 4- Recognize connections between theory and applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1) Solving and computing real-world applications of finite and discrete mathematics. 2) Setup and solve linear systems geometrically and algebraically. 3) Solve problems in a range of mathematical applications using derivatives. 4) Represent vectors analytically and geometrically, and compute dot and cross products for presentations of lines and planes. 5) Distinguish between the concept of sequence and series and determine limits of sequence. 6) Define, differentiate and integrate functions represented as power series expansions, including Taylor series.
Indicative Contents المحتويات الإرشادية	Define

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 types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.0

Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Ordinary Linear Differential Equations - 1st order differential equations
Week 2	- 1st order differential equations
Week 3	- 2nd Order Differential Equations
Week 4	- 2nd Order Differential Equations
Week 5	- Higher Order Differential Equations
Week 6	- Higher Order Differential Equations
Week 7	- Higher Order Differential Equations
Week 8	- Applications
Week 9	Sequences and Series
Week 10	Sequences and Series
Week 11	Fourier Series
Week 12	Fourier Series
Week 13	Partial Differentiation
Week 14	Partial Differentiation
Week 15	General Application
Week 16	

Code	Course/Module Title	ECTS	Semester
	Mathematics 4	4	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	1	63	37
Description			

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Mechanics (Dynamics 1)		Module Delivery الرجاء الاستفادة من الجدول اخر صفحة		
Module Type	MEC0012		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	-				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII	Semester of Delivery		Four
Administering Department		Mechanical	College	Engineering	
Module Leader	ا م د انور جمعة احمد		e-mail	aalobaidi@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Prof.	Module Leader's Qualification		PhD
Module Tutor	رضوان		e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number	1.0	

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 an understanding of body motion. 2. To understand the kinematics and kinetics of particles and rigid bodies. 3. To understand Newton's Laws. 4. To understand the relative motion of particles and rigid bodies. 5. This course studies particles' impact, impulse, and momentum.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the Rectilinear Kinematics Motion (Continuous and Curvilinear Motion) 2. Discuss the Projectile Motion 3. Describe Absolute dependent motion and The Relative Motion 4. Discuss the Kinetics of a Particle and the equation of motion (EoM) 5. Describe the various coordinates of motion: Normal and Tangential coordinates + Cylindrical coordinates

	6. Understand Work and Energy 7. Understand Power and efficiency 8. Discuss Impulse and Momentum + Impact of bodies 9. Study the Planar Kinematics of a rigid body: Rotation + Absolute Motion 10. Understand Relative Motion Analysis: Velocity, Instantaneous Center of Zero Velocity, acceleration and rotating axis
Indicative Contents المحتويات الإرشادية	- Dynamics is divided into kinematics and kinetics. Kinematics describes the motion of objects, while kinetics studies forces that cause changes of motion. - The first part, the kinematics, will cover particles through the first (6 weeks), including the linear and non-linear motion. - The second part, the Kinetics, will discuss and explain from the 7th week until week 10, including the work and energy principles, power and efficiency, impulse and momentum. Additionally, the last 5 weeks will study the Planar Kinematics of a rigid body: Rotation + Absolute Motion. Then understanding the Relative Motion Analysis: Velocity, Instantaneous Center of Zero Velocity, acceleration and rotating axis

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in the exercises, while at the same time improving and expanding their critical thinking skills. This will be achieved through classes and interactive tutorials.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.4667
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Work and Energy
Week 2	Principle of work and energy for a system
Week 3	Power and efficiency
Week 4	Conservative Forces and Potential Energy
Week 5	Impulse and Momentum
Week 6	Impact
Week 7	Mid-term Exam +
Week 8	Planar Kinematics of a rigid body: Rotation
Week 9	Planar Kinematics of a rigid body: Absolute Motion
Week 10	Relative Motion Analysis: Velocity
Week 11	Instantaneous Center of Zero Velocity
Week 12	Relative Motion Analysis: Acceleration
Week 13	Relative Motion Analysis: Acceleration
Week 14	Relative Motion analysis using Rotating Axes
Week 15	Report Discussion
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: /
Week 2	Lab 2: /
Week 3	Lab 3: /
Week 4	Lab 4: /
Week 5	Lab 5: /
Week 6	Lab 6: /
Week 7	Lab 7: /

Code	Course/Module Title	ECTS	Semester
	Engineering Mechanics (Dynamics)	4	Four
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	1	48	52
Description			
Dynamics is the study of how moving objects behave. Dynamics is the part of mechanics that studies movement and its causes. Therefore, this course deals with the causes of motion and changes in motion, Besides, the results of this motion, such as the Impact between bodies. Dynamics is distinguished from kinematics, which describes motion, without regard to its causes, in terms of position, velocity, and acceleration, and kinetics, which is concerned with the effect of forces and torques on the motion of bodies having mass. As a rule, the motions of bodies obey Newton's laws of motion. Newton's second law is one of the most important in all of physics.			

Module Information					
معلومات المادة الدراسية					
Module Title	2اللغة العربية		Module Delivery		
Module Type	Basic B اساسية		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	WU21				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		UGII			Semester of Delivery
Administering Department		WAR	College	College of Engineering	
Module Leader	زينب دايع مطر		e-mail	Zainabaleanzy@uowasit.edu.iq	
Module Leader’s Acad. Title		مدرس	Module Leader’s Qualification		PhD.
Module Tutor			e-mail		
Peer Reviewer Name		مشتاق كاظم جمعة	e-mail	mjmaah@uowasit.edu.iq	
Scientific Committee Approval Date			Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- تنبيه الطلبة بأهمية اللغة العربية في تنمية القدرات والمهارات الاتصالية بين المتكلم والمتلقي. 2- تمكن الطلبة من التحدث بلغة عربية سليمة وتجنب الأخطاء الإملائية واللغوية الشائعة. 3- كتابة التقارير والمقالات والمخاطبات الرسمية باللغة العربية وبشكل انسيابي و دقيق و منظم. 4- تعريف الطلبة بالكتابة والقراءة الصحيحة . 5- تواصل الطلبة مع لغتهم الأم. 6- تطوير قابلية الطلبة على أداء اللغة والقائها بصورة سليمة في المحافل المختلفة .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	عند الانتهاء من هذا الفصل، سيكون الطلاب قادرين على: 1- رفع مستوى الكفاءة التعبيرية الشفهية والكتابية لدى الطلبة. 2- قدرة الطلبة على تحليل وفهم النصوص الشعرية والنثرية. 3- تعرف الطلبة على مفردات لغوية تسهم في إثرائهم المعرفي في تخصصهم الهندسي. 4- إظهار فهم الطلبة لأهمية اللغة العربية في لغة التخاطب والتعبير عن اهتماماتهم الثقافية والفكرية. 5- تمكن الطلبة من قراءة القرآن الكريم بصورة صحيحة. 6- تساهم في زيادة معرفة الطلاب بكيفية كتابة البحوث العلمية وفق المنهج الأكاديمي والمخاطبات الرسمية والحد من ظاهرة الأخطاء اللغوية .
Indicative Contents المحتويات الإرشادية	يتم اللقاء المحاضرة مع الطلبة بصورة مباشرة ويتخلل المحاضرة نقاش وحوار مع الطلبة من خلال طرح الاسئلة الموضوعية حول مفردة المنهج الموضوع الدرس . ويتم بعدها الاستماع لآراء الطلبة ومداخلاتهم من خلال الاجابة على الاسئلة بالوسائل التوضيحية المتوفرة . وارسال المحاضرات لهم ليكون الطلبة على استعداد تام لتحضير الدرس . وفي نهاية الدرس يتم إعطاء ملخص عن المحاضرة.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	- شرح المادة النظرية للطلبة بشكل تفصيلي. - مشاركة الطلبة في المناسبات والمهرجانات الخطابية في المجتمع الأكاديمي. - إشاعة روح التعاون والعمل الجماعي بين الطلبة.
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	القواعد: التمييز
Week 2	القواعد: اسم الإشارة
Week 3	القواعد: النسب
Week 4	قواعد : جمع التوكسير
Week 5	قواعد: حروف الجر
Week 6	القواعد: أنواع الواو في اللغة العربية
Week 7	الاملاء: الفرق بين التاء المربوطة والتاء المفتوحة

50	العبء الكلي للمادة خلال الفصل:			
2	عدد الوحدات:			
*لا توجد ساعات مجدولة لهذه النشاطات كون تم استيفائها ضمن الصفوف الدراسية.				

Module Information					
معلومات المادة الدراسية					
Module Title	Strength of Materials 2		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC0020				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII	Semester of Delivery		Four
Administering Department		Mechanical	College	Engineering	
Module Leader	د.م.أ. حسين رزاق صباح		e-mail	hrzzaq@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Prof.	Module Leader's Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name		Dr.Radwan M. Adday	e-mail	aalobaidi@uowasit.edu.iq	
Scientific Committee Approval Date		25-6-2023	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aims of this module are to: 6. Familiarize the students with the types of loadings and types of beam section. 7. Teach the students the rules of drawing shear force and bending moments and their importance. 8. Teach the students the calculation of transverse shear stress using the shear force diagram for symmetrical and unsymmetrical beam section. 9. Teach the students the calculation of flexural stress using the bending moment diagram for symmetrical and unsymmetrical beam section.

	10. Provide the students with adequate knowledge on the analysis of problems that combine the transverse shear stress and flexural stress and stress. 11. Teach the students the analysis and calculation of beam deflection, and knowing the concepts of slope and boundary conditions
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	11. A good understanding for the types of beam configuration and applied loads. 12. Adequate knowledge on drawing shear force and bending moment diagrams. 13. Sufficient ability to perform deformation analysis for transverse shear stress induced from the shear force. 14. Sufficient ability to perform deformation analysis for flexural stress induced from the bending moments. 15. Adequate knowledge on the effect of beam section on the calculation of transverse shear stress and flexural shear stress. 16. Familiarize the students with the types of boundary conditions of beams under various configurations. 17. Adequate knowledge on the meaning of beam slope, beam deflection and the way to calculate them.
Indicative Contents المحتويات الإرشادية	Beams : definition, beam configuration, load types, and various beam section [3 hrs] Shear force and bending moment diagrams: definition, their importance, equation methods, semi graphical method, zero shear points [15 hrs]. Transverse shear stress: Mathematical formula, symmetrical beam section, unsymmetrical beam sections, parallel axes theorem [15 hr] Flexural stress: Mathematical formula, symmetrical beam section, unsymmetrical beam sections [15 hr] Beam deflection: definition, boundary conditions, double integration methods, and slope at different points of the beam [12 hrs].

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module contains: 1. Explaining the outline of the class lecture in the beginning and relating (if possible) the present lecture with the previous one. 2. Involving students in interactive tutorials and groups solving of problems. 3. Encouraging the students' participation in the exercises. At the same time, the strategy will adopt expanding the student thinking through short questions. 4. For further understanding the module, the students will be asked for a number of assignment that can reflect their understanding for the materials in the module.
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definition of beams, types of loads, beams configurations, beam sections.
Week 2	Shear force and bending moment diagrams, their importance, Equation methods
Week 3	Equation method: solving Problems
Week 4	Quiz 1, Semi graphical method: rules, solving problems
Week 5	Midterm 1, submission of assignment 1
Week 6	Transverse shear stress: mathematical formulation, symmetrical beam section problems
Week 7	Transverse shear stress: mathematical formulation, unsymmetrical beam section problems
Week 8	Quiz 2, Flexural (i.e. bending) stress: mathematical formulation, symmetrical beam section problems
Week 9	Flexural (i.e. bending) stress: mathematical formulation, unsymmetrical beam section problems
Week 10	Midterm 2, submission of assignment 2
Week 11	Beam deflection: introduction, double integration method, boundary conditions
Week 12	Beam deflection: solving problems
Week 13	Beam deflection: solving problems
Week 14	Quiz 3, Report discussion
Week 15	Continuation of report discussion, submission of assignment 3
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2,3	Lab 1: Elastic bending test
Week 4,5,6	Lab 2: Unsymmetrical cantilever beam bending
Week 7,8,9	Lab 3: Shear force test
Week 10,11,12	Lab 4: Beam deflection
Week 13, 14, 15	Lab 5: Hardness test

Code	Course/Module Title	ECTS	Semester
	Strength of Materials 2	4	Four
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	4	63	37
Description			
The strength of materials 2 module focuses mainly on the stresses in the beam. This module covers the definition of different beam configurations, beam loadings and beam sections. Then, it presents two methods for drawing shear force and bending moment's diagrams and explain their importance for mechanical engineers. The module also provide students with adequate knowledge on stresses in beams that caused by shear force and bending moments and shed the light on the effect of beam section on theses stresses values. In addition, it covers the concepts of beam deflection, slope, and boundary conditions. After studying this module, the students are expected adequate knowledge and skills for further complicated problems in machine element design.			

Module Information						
معلومات المادة الدراسية						
Module Title	جرائم نظام حزب البعث			Module Delivery		
Module Type	S			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	WU05					
ECTS Credits	2					
SWL (hr/sem)	50					
Module Level		UGII		Semester of Delivery		One
Administering Department		WAR		College	College of Engineering	
Module Leader	زينب داينخ مطر			e-mail	Zainabaleanzy@uowasit.edu.iq	
Module Leader's Acad. Title		مدرس		Module Leader's Qualification		PhD.
Module Tutor				e-mail		
Peer Reviewer Name		مشتاق كاظم جمعة علياء كاظم جبر		e-mail	mjmaah@uowasit.edu.iq aliaa.kadim@uowasit.edu.iq	
Scientific Committee Approval Date		2024-8-28		Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1-Informing students about the countless crimes of the Baath regime in Iraq against Iraqis 7- اطلاع الطلبة على جرائم نظام البعث في العراق التي لا تعد ولا تحصى ضد العراقيين 2-Raising students' awareness to reject all forms of injustice, tyranny, violence and persecution of these oppressive regimes 8- رفع الوعي لدى الطلبة لرفض جميع أشكال الظلم والتسلط والعنف والاضطهاد لهذه الأنظمة القمعية 3-Enabling students to write reports and articles in Arabic in a smooth, accurate and organized manner 9- تمكين الطلبة من كتابة التقارير والمقالات باللغة العربية وبشكل انسيابي دقيق ومنظم 4-Highlighting serious violations of human rights and the environment 10- تسليط الضوء على الانتهاكات الخطيرة لحقوق الإنسان والبيئة 5-Explaining the facts of this unjust regime to generations that did not go through the stages of its rule 11- بيان حقائق هذا النظام الجائر إلى الأجيال التي لم تمر بمراحل حكمه 6-Informing students about the extent of the Baathist regime in Iraq's fight against religion and scholars in seminaries 12- اطلاع الطلبة على مدى محاربة النظام البعثي في العراق للدين والعلماء في الحوزات العلمية
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	عند الانتهاء من هذا الفصل، سيكون الطلاب قادرين على: Upon completion of this chapter, students will be able to 1-The student's knowledge of Baath crimes according to the Iraqi Criminal Court law 7- معرفة الطالب بجرائم البعث وفق قانون المحكمة الجنائية العراقية 2-Using linguistic terms to define the crime 8- استعمال المصطلحات اللغوية للتعريف بالجريمة. 3-Identify the decisions issued by the Iraqi Criminal Court against the regime and its cronies 9- تعرف الطلبة على القرارات الصادرة من المحكمة الجنائية العراقية ضد النظام وأزلامه 4-Demonstrating students' understanding of the effects of psychological crimes and the environment on the Iraqi individual at that time 10- إظهار فهم الطلبة لأثار الجرائم النفسية والبيئة على الفرد العراقي آنذاك 5-Identifying mass graves and when they occur 11- تعرّف الطلبة على المقابر الجماعية ووقت حدوثها 6-Watch video documents of the crimes of the defunct Baath Party 12- مشاهدة وثائق مصورة لجرائم حزب البعث البائد
Indicative Contents المحتويات الإرشادية	Part A: Explain the concept of crimes. (12.5 hr) Part B: Reading (12.5 hr) Part C: Writing (12.5 hr) Part D: Speaking (12.5 hr)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• تقديم المحاضرات النظرية وتحديد المعلومات الأكثر أهمية من خلال استخلاص الكلمات المفتاحية والأفكار. • يتم منح الطلاب فرصًا لمعرفة الجرائم التي ارتكبت بحق الشعب العراقي في زمن النظام البائد • Present theoretical lectures and determine the information that is most significant by extracting keywords and ideas. • Students are given opportunities to learn about the crimes committed against the Iraqi people during the time of the former regime
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Chapter One: The concept of crimes and their types, 1- Definition of crime linguistically and terminologically الفصل الأول: مفهوم الجرائم وأقسامها, 1- تعريف الجريمة لغة واصطلاحا
Week 2	Chapter One: 1- Sections of crimes. 2- Types of crimes الفصل الأول: 1- أقسام الجرائم. 2- أنواع الجرائم
Week 3	Chapter One: Decisions issued by the Supreme Criminal Court/the most prominent cases considered by the court الفصل الأول : القرارات الصادرة من المحكمة الجنائية العليا/ ابرز القضايا التي نظرت فيها المحكمة
Week 4	Chapter Two: Psychological and social crimes and their effects, and the most prominent violations of the Baathist regime in Iraq الفصل الثاني: الجرائم النفسية والاجتماعية وآثارها, وأبرز انتهاكات النظام البعثي في العراق 1- Psychological crimes and their effects 1-الجرائم النفسية, وآثارها
Week 5	Chapter Two: 1-Social crimes and their effects الفصل الثاني: 1-الجرائم الاجتماعية وآثارها
Week 6	Chapter Two: Violations of Iraqi laws, images of human rights violations and crimes of authority الفصل الثاني : انتهاكات القوانين العراقية, صور انتهاكات حقوق الإنسان وجرائم السلطة
Week 7	Chapter Two: 1- Some decisions regarding political and military violations of the Baath regime 2- Prison and detention places of the Baath regime. الفصل الثاني: 1- بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث 2- اماكن السجون والاحتجاز لنظام البعث.

Week 8	Chapter Three: Environmental crimes of the Baath regime in Iraq 1-Military and radioactive contamination and mine explosions 2-Firstly, Basra, the use of internationally banned weapons, the dangers of mines, and contamination with radioactive materials الفصل الثالث: الجرائم البيئية لنظام البعث في العراق. 1- التلوث الحربي والاشعاعي وانفجار الألغام أولا البصرة، استعمال الاسلحة المحرمة دوليا ومخاطر الألغام، والتلوث بالمواد المشعة.
Week 9	Exam امتحان
Week 10	Chapter Three: Second: The city of Halabja. الفصل الثالث: ثانيا: مدينة حلبجة. 2- Destruction of cities and villages (scorched earth policy) 2- تدمير المدن والقرى (سياسة الأرض المحروقة)
Week 11	Chapter Three: 3- Drying the marshes, 4- Razing palm groves, trees and crops الفصل الثالث: 3- تجفيف الأهوار، 4- تجريف بساتين النخيل والأشجار والمزروعات
Week 12	Chapter Four: Introduction to mass graves, 1- Mass grave events الفصل الرابع: التعريف بالمقابر الجماعية، 1- أحداث المقابر الجماعية
Week 13	-Chapter Four: Chronological classification of genocide graves in Iraq for the period 1963 AD - 2003 AD -Graves of genocide committed by the defunct Baath regime 1979-1988 AD - -Genocide graves related to the Iran-Iraq war for the period 1980-1988 AD الفصل الرابع: التصنيف الزمني لمقابر الإبادة الجماعية في العراق للمدة 1963م-2003م - مقابر الإبادة الجماعية المرتكبة من قبل نظام البعث البائد 1979م-1988م - مقابر الإبادة الجماعية ذات الصلة بالحرب العراقية- الإيرانية للمدة 1980م-1988م
Week 14	Chapter Four: - Graves of the 1983 Barzanian Kurdish genocide الفصل الرابع: - مقابر الابادة الجماعية للأكراد البرزانيين لعام 1983م -Genocide graves for victims of the Anfal massacre for the period 1987-1988 AD - مقابر الابادة الجماعية لضحايا مجزرة الانفال للمدة 1987م-1988م
Week 15	Chapter Four: Genocide graves for the victims of the 1999 Shaabaniya uprising الفصل الرابع: مقابر الابادة الجماعية لضحايا الانتفاضة الشعبانية لعام 1999م

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Platform for the crimes of the Baath Party in Iraq - Ministry of Higher Education and Scientific Research منهاج جرائم حزب البعث في العراق - وزارة التعليم العالي والبحث العلمي	
Recommended Texts	The cognitive foundation for studying the crimes of the Baath Party in Iraq, written by: Dr. Qais Nasser and Professor Abdul Hadi Maatouq التأسيس المعرفي لدراسة جرائم حزب البعث في العراق, تأليف: د. قيس ناصر والأستاذ عبد الهادي معتوق	
Websites		

Baath Party crimes

نوع النشاط	الساعات المجدولة SSWL	الساعات غير المجدولة USSWL	عدد الأسابيع	ساعة لكل أسبوع	العبء الكلي للساعات
محاضرات	محاضرات في القاعات الدراسية		15	2	30
المختبر	دوام المختبر		0	0	0
مناقشات*	المناقشات		0	0	0
مشروع عملي*	مشروع عملي		0	0	0
		التهيئة للمشروع	0	0	0
تحضير الدروس اليومي		تحضير الدروس اليومي	13	1	1
العروض التقديمية*	القاء العرض التقديمي		0	0	0
		التهيئة للعرض التقديمي	0	0	0
الامتحانات اليومية	الامتحان		0	0	0
		التهيئة لامتحانات اليومية	2	1	2
امتحان نصف الفصل	الامتحان		0	0	0
		التهيئة لامتحان	1	1	1
امتحان نهاية الفصل	الامتحان		1	3	3
		التهيئة لامتحان	1	1	1
		العبء الكلي للمادة خلال الفصل:			50
		عدد الوحدات:			2

*لا توجد ساعات مجدولة لهذه النشاطات كون تم استيفائها ضمن الصفوف الدراسية.

Module Information					
معلومات المادة الدراسية					
Module Title	Computer 2		Module Delivery		
Module Type	B		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	WU22				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level		UGII			Semester of Delivery
Administering Department		Mechanical	College	Engineering	
Module Leader	Osamah Malik Mohammed		e-mail	osamah.malik@uowasit.edu.iq	
Module Leader’s Acad. Title		Lec. Dr.	Module Leader’s Qualification		Ph.D.
Module Tutor	Osamah Malik Mohammed		e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		31/01/2025	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Many of our students take advantage of our college's fundamental computer courses, which educate them on the principles of computers and the Internet's underlying technologies and skills. The course introduces students to the fundamentals of computing, including the use of a variety of different hardware and software components. There is no prerequisite knowledge in either programming or Computer science.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Utilize the computer for fundamental tasks. 2. Identify and discuss the hardware components of the computer system. 3. Creating documents using a word processor and creating presentations. 4. Conducting research on the Internet. 5. An introduction to Artificial Intelligence.
Indicative Contents المحتويات الإرشادية	Board (normal or smart) Computers Presentation software such as powerpoint

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Security and Networking
Week 2	Security and Networking (Cont.)
Week 3	E-Commerce
Week 4	Computer Troubleshooting
Week 5	Computer Troubleshooting (Cont.)
Week 6	Introduction to AI
Week 7	Introduction to AI (Cont.)
Week 8	The Role of AI in Modern Smartphones
Week 9	The Role of AI in Modern Smartphones (Cont.)
Week 10	Applications and Tools of AI
Week 11	Applications and Tools of AI (Cont.)
Week 12	Applications and Tools of AI (Cont.)
Week 13	AI and Society
Week 14	Ethical Challenges in AI
Week 15	The Future of AI

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Basic Network components
Week 2	Computer troubleshooting
Week 3	Virtual assistants
Week 4	Adaptive learning
Week 5	Robotics
Week 6	Robotics (cont.)
Week 7	Privacy and surveillance

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?

Required Texts	Graham Brown, David Watson, "Cambridge IGCSE Information and communication technology" 3 rd edition (2020)	
Recommended Texts	Alan Evans, Kendall Martin, Mary Anne Poatsy "technology in action complete" 16 th edition (2020)	
Websites		

Code	Course/Module Title	ECTS	Semester
WU22	Computer 2	3	
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2		63	12
Description			
The purpose of this module is to develop students' linguistic ability by focusing on the key skills of reading, writing, speaking and listening, to encourage students to become independent learners and to introduce them to strategies and skills to enable them to cope with the demands, both academic and cultural, of undergraduate study in an English-speaking environment.			

Module Information					
معلومات المادة الدراسية					
Module Title	Thermodynamic 1		Module Delivery		
Module Type	C		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC0015				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGI	Semester of Delivery		Three
Administering Department		Mechanical	College	Engineering	
Module Leader	Ali Abdulruda Farhan Al-Hamadani		e-mail	aalhamadani@uowasit.edu.iq	
Module Leader’s Acad. Title		Professor	Module Leader’s Qualification		Ph.D.
Module Tutor	Ali Abdulruda Farhan Al-Hamadani		e-mail	aalhamadani@uowasit.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		16-09-2024	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	- اطلاع الطلبة على أساسيات ديناميك الحرارة ومصطلحاتها والتعرف على أنواع الطاقة وقوانين ديناميك الحرارة. - Students are taught the fundamentals of thermodynamics, its terminology, energy kinds, and the rules of thermodynamics. - تشجيع الطلبة على البحث عن المعرفة العلمية لتوسيع معلوماته الهندسية للعمليات الحرارية المختلفة. - encouraging students to pursue scientific information in order to increase their understanding of different thermal processes in engineering. - دراسة الانظمة الحرارية وانواعها وكيفية تحليلها - study of thermal systems, including types and analysis techniques. - دراسة مقدمة على معادلات توازن الطاقة ومحطات القدرة. - An introduction to power plants and energy balance equations

	• الاطلاع على المصطلحات الحديثة في ديناميك الحرارة ودراسة معادلاتها. • understanding the equations of thermodynamics and reviewing its current vocabulary
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Cognitive objectives الاهداف المعرفية 1- معرفة اهمية دراسة العمليات الحرارية المختلفة في الجانب العملي Realizing the value of investigating various thermal processes from a practical perspective. 2- معرفة دور التصميم الحراري Understand the role of the thermal design. 3- اكساب الطالب الثقة للمشاركة في تحليل الانظمة gaining the confidence of a student to engage in systems analysis skill objectives related to the الاهداف المهاراتية الخاصة بالمقرر course 4- تنمية اهمية دراسة العمليات الحرارية Emphasize the value of learning about thermal processes. 5- تنمية مهارة اكتساب المعلومة والتحليل والاستنتاج enhancing one's capacity for collecting, analyzing, and conclusion. 6- تطبيقات العمليات الحرارية المختلفة في التطبيقات الهندسية Numerous thermal processes and their applications in engineering.
Indicative Contents المحتويات الإرشادية	12.5 hrs : 12.5 hrs : 12.5 hrs : 12.5 hrs :

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The second law of thermodynamics. 1-Friction. 2-Reversible and Irreversible Process.
Week 2	1-Heat Engine. 2-Reversed Heat engine. 3-Engine thermal efficiency. 4-Coefficient of Performance. 5-The second law Statements.
Week 3	Ideal Carnot Cycle. 1-The Carnot cycle. 2-Thermal Efficiency. 3-The Reversed Carnot cycle.
Week 4	Entropy. 1-Degradation of Energy. 2-Entropy, State function. 3-(T-S) Diagram.
Week 5	Entropy in Process. 1-Carnot Cycle on (T-S) Diagram. 2-Isentropic efficiency.
Week 6	Air Standard cycle. 1-Otto cycle, diagram and process.
Week 7	2- Diesel cycle, diagram and process.
Week 8	1-Dual cycle, diagram and process. 2-Comparison of air standard cycle.
Week 9	Joule, Brayton cycle, diagram and process.
Week 10	1-The Rankine cycle 2-Rankine with superheat 3-The enthalpy-entropy chart(h-s chart) 4-Dryness fraction of wet steam
Week 11	5-Steam condensers 6-The reheat cycle
Week 12	7-the regenerative cycle
Week 13	Gas Mixture. 1-Elements, Compounds and Mixtures. 2-The Atomic (Molecular) mass.
Week 14	1-Avogadro's Law 2-Dalton's law.
Week 15	3- Amagat Law. 4-Molar volume and R. 5-Volumetric and weight Analysis.

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

	Material Covered
Week 1	Heat pump 1-Refrigerator 2-compressor 3-Vaporization 4-Condensation 5- Vaporization enthalpy
Week 2	Heat pump air-water
Week 3	Heat capacity of gases
Week 4	Thermal equation of state and critical point
Week 5	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Cengel, Yunus A. and Boles, Michael, A. " Thermodynamics: An Engineering Approach" 7 th ed. (SI units), 2014.	yes
Recommended Texts	1-Applied Thermodynamics for Engineering Technology By T. D. Eastop and A. McConkey. 2-Fundamentals of thermodynamics, 6 th edition, by Sonntag,Borgnakke and Van Wylen.	yes
Websites	https://classroom.google.com/c/NzEzMTQwODExNTUy	

Code	Course/Module Title	ECTS	Semester
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	4	63	73
Description			
اطلاع الطلبة على اساسيات ديناميك الحرارة مصطلحاتها والتعرف على انواع الطاقة وقوانين ديناميك الحرارة.			

- Students are taught the fundamentals of thermodynamics, its terminology, energy kinds, and the rules of thermodynamics.

- تشجيع الطلبة على البحث عن المعرفة العلمية لتوسيع معلوماته الهندسية للعمليات الحرارية المختلفة.

- encouraging students to pursue scientific information in order to increase their understanding of different thermal processes in engineering.

Module Information					
معلومات المادة الدراسية					
Module Title	Nontraditional Manufacturing processes		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	S		☐ Theory Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar ☐		
Module Code	MEC3315				
ECTS Credits					
SWL (hr/sem)					
Module Level		UG III	Semester of Delivery		Six
Administering Department		Mechanical	College	Engineering	
Module Leader	أ.د عزام صباح حميد البندقي		e-mail	azzam@uowasit.edu.iq	
Module Leader's Acad. Title		Prof	Module Leader's Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The course aims are as follows: • Recognize and understand the fundamental principles of major non-traditional manufacturing processes used in modern industry. • Understand the different mechanisms of material removal based on mechanical, electrical, electrochemical, chemical and thermal energy. • Analyze the effects of process parameters on material removal rate, tool wear, surface roughness, dimensional accuracy and surface integrity. • Compare the capabilities, advantages, limitations and applications of different non-traditional manufacturing processes. • Select an appropriate non-traditional manufacturing process according to workpiece material, geometry, accuracy and surface quality requirements. • Understand the economic, environmental and safety considerations associated with non-

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1.1 Students will demonstrate the ability to classify non-traditional manufacturing processes according to the type of energy used for material removal. 1.2 Students will demonstrate an understanding of the mechanisms of material removal in mechanical, electrochemical, electrical and thermal processes. 1.3 Students will demonstrate the ability to identify the major components and operating principles of non-traditional machining equipment. Outcome 2: To teach students to perform mathematical analyses of non-traditional manufacturing processes. 2.1 Students will demonstrate the ability to identify known and unknown process parameters. 2.2 Students will demonstrate the ability to apply fundamental principles of mechanics, materials, electricity, electrochemistry and thermal sciences to analyze selected non-traditional manufacturing processes. 2.3 Students will demonstrate the ability to calculate important process characteristics such as material removal rate and machining time for selected processes. Outcome 3: To train students to analyze the effects of process parameters on machining performance. 3.1 Students will demonstrate knowledge of the major process parameters affecting non-traditional machining processes. 3.2 Students will demonstrate the ability to relate process parameters to material removal rate, tool wear, surface roughness, dimensional accuracy and surface integrity.
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	3.3 Students will demonstrate the ability to interpret experimental and process capability data. Outcome 4: To teach students to select appropriate non-traditional manufacturing processes. 4.1 Students will demonstrate knowledge of the capabilities, advantages and limitations of major non-traditional manufacturing processes. 4.2 Students will demonstrate the ability to select suitable processes based on workpiece material, geometry, dimensional accuracy and surface finish requirements. 4.3 Students will demonstrate an understanding of technical and economic considerations in process selection.
Indicative Contents المحتويات الإرشادية	

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 solving engineering problems related to non-traditional manufacturing processes while developing their analytical and critical-thinking skills. This will be achieved through classroom lectures, interactive discussions, tutorials, numerical exercises, case studies and analysis of industrial applications. Students will also be encouraged to compare different non-traditional processes and select appropriate machining methods for specific engineering materials and product requirements.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	42	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Week 1: Introduction to Non-Traditional Manufacturing Processes; need, classification and comparison with conventional machining.
Week 2	Week 2: Mechanical Energy Processes – Ultrasonic Machining (USM): principle, equipment, mechanism of material removal and process parameters.
Week 3	Week 3: USM calculations, material removal rate, tool wear, applications, advantages and limitations.
Week 4	Week 4: Abrasive Jet Machining (AJM): principle, equipment, process parameters, applications and limitations.
Week 5	Week 5: Water Jet Machining (WJM) and Abrasive Water Jet Machining (AWJM): principles, equipment, parameters and applications.
Week 6	Week 6: Chemical Machining (CHM): chemical milling, blanking, process steps, masking and etchants.
Week 7	Week 7: Electrochemical Machining (ECM): working principle, electrochemical reactions, equipment and process parameters.
Week 8	Week 8: ECM calculations, material removal rate, accuracy, surface quality, applications and Electrochemical Grinding (ECG).
Week 9	Week 9: Electrical Discharge Machining (EDM): working principle, spark generation, dielectric fluid and equipment.
Week 10	Week 10: EDM process parameters, material removal rate, tool wear, surface roughness, surface integrity and applications.
Week 11	Week 11: Wire Electrical Discharge Machining (WEDM): principle, equipment, process parameters and applications.
Week 12	Week 12: Laser Beam Machining (LBM): principle, laser generation, material removal mechanism, parameters and applications.
Week 13	Week 13: Electron Beam Machining (EBM): principle, equipment, process characteristics and applications.
Week 14	Week 14: Plasma Arc Machining (PAM): principle, equipment, process parameters and industrial applications.
Week 15	Week 15: Comparison and selection of non-traditional manufacturing processes; technical, economic and environmental considerations.
Week 16	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Nontraditional Manufacturing processes		
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	2	33	42
Description			
This course is a quantitative and qualitative study of the main non-traditional manufacturing processes used in modern industry. It illustrates the principles and mechanisms by which materials can be removed using mechanical, chemical, electrochemical, electrical and thermal forms of energy rather than conventional cutting tools. The course provides a detailed understanding of processes such as Ultrasonic Machining, Abrasive Jet Machining, Water Jet Machining, Electrochemical Machining, Electrical Discharge Machining, Laser Beam Machining, Electron Beam Machining and Plasma Arc Machining. It relates workpiece material properties and product requirements to the selection of suitable non-traditional manufacturing processes. The course also discusses process parameters and their effects on material removal rate, tool wear, surface roughness, dimensional accuracy and surface integrity. Basic calculations and analytical models for selected processes are introduced. Major applications, advantages, limitations, economic considerations and environmental aspects of each process are also discussed. By completing this course, students will develop the ability to analyze, compare and select appropriate non-traditional manufacturing processes for machining advanced materials and manufacturing complex engineering components.			

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Mechanics: Statics 2		Module Delivery الرجاء الاستفادة من الجدول ادر صفحة		
Module Type	C		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC005				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGI	Semester of Delivery		Two
Administering Department		Mechanical	College	Engineering	
Module Leader	ا م د. رضوان محمد عداي		e-mail	raddai@uowasit.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		PhD
Module Tutor	ا م د. رضوان محمد عداي		e-mail	raddai@uowasit.edu.iq	
Peer Reviewer Name		ا م د انور جمعة احمد	e-mail	aalobaidi@uowasit.edu.iq	
Scientific Committee Approval Date		25-6-2023	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	-To solve some engineering issues related to the study of the balance of physical bodies and the mutual influence arising from them. -It helps the student to understand how to prove the areas and centres of different geometric shapes. -Understanding the physical meaning of some engineering terms. -Be familiar with the principle of the friction force. -To develop skills of reasoning and production. -Increasing the student's geometric and imaginative sense and using geometric and descriptive drawing to solve some problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1 - Study the principle of equilibrium in 2D and 3D. 2- Define the truss and calculate the force in each member of it. 3- Compute the distributed load above a line shape. 4-Study the centroid of shapes. 5- Explain the first and second moment of inertia. 6- Determine the friction force between two surfaces at various direction.
Indicative Contents المحتويات الإرشادية	Equilibrium- An introduction to equilibrium and its forms to compute the reaction forces in 2D and 3D. [16hr] Trusses- Define the trusses and its forms and calculate forces in members of a truss. [8hr] Distributed load- List types of loads and how can calculate forces from them

	[10hr] Centroid- Learn how we can indicate the centre of shapes. [5hr] First and second moment of Inertia- Explain the object of studying this subject in statics and how it important for engineering design. [16hr] Friction- Calculate the friction force and indicate the friction either static or dynamic. [8hr]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	According to the prescribed curriculum using face-to-face education with the use of e-learning methods, by giving lectures via Google meet with a video presentation of the lecture through the Google Classroom application. As for the methods of evaluation, relying on the method of discussion and questions and answers during the lecture time, as well as relying on homework and oral questions during the electronic class.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 15 اسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.133
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Definition of the equilibrium term and explain the free body diagram of 2D
Week 2	Calculation of reaction forces of 2D problem
Week 3	Explain the free body diagram of 2D
Week 4	Calculation of reaction forces of 3D problem
Week 5	Define the trusses and its forms calculate forces in members of a truss
Week 6	Calculate forces in members of a truss using the joint or section method
Week 7	List types of loads and
Week 8	How can calculate force from distributed loads
Week 9	Learn how we can indicate the centre of shapes+ Define first and second moment of Inertia

Week 10	More explain about first and second moment of Inertia
Week 11	Compute the first moment of inertia for various shapes
Week 12	Compute the second moment of inertia for various shapes and engineering design
Week 13	Mid -term exam+ Define friction and its types
Week 14	Calculate the friction force and indicate the friction either static or dynamic
Week 15	Solve friction problems
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Force table Group A
Week 2	Lab 1: Force table Group B
Week 3	Lab 1: Report and Discussion Lab 1 Group A
Week 4	Lab 1: Report and Discussion Lab 1 Group B
Week 5	Lab 2: Verification of support reactions of a simply supported beam Group A
Week 6	Lab 2: Verification of support reactions of a simply supported beam Group B
Week 7	Lab 2: Report and Discussion Lab 2 Group A
Week 8	Lab 2: Report and Discussion Lab 2 Group B
Week 9	Lab 3: Verification of the principle of moments using the bell crank lever apparatus Group A
Week 10	Lab 3: Verification of the principle of moments using the bell crank lever apparatus Group B
Week 11	Lab 3: Report and Discussion Lab 3 Group A
Week 12	Lab 3: Report and Discussion Lab 3 Group B
Week 13	Lab 4: Determination of coefficient of friction between two surfaces Group A
Week 14	Lab 4: Determination of coefficient of friction between two surfaces Group B
Week 15	Lab 4: Report and Discussion Lab 3 Group A+ B

Activity	SSWL (hr/sem)	USWL (hr/sem)	Weeks No.	hr/week	Total load of the activity
Lectures	Lectures in Class		15	3	45
Lab	Laboratory time		15	1	15
Tutorials	Discussions		15	1	15
Assignments	Assignments		0	0	0
		Preparing Assignments	5	1	5
Preparing daily lectures		Preparing daily lectures	15	1	15
Report	Providing Report		0	0	0
		Preparing Report	1	1	1
Quizzes		Preparing Quizzes	5	1	5
Mid-term exam	Examination		0	0	0
		Preparing for mid-exam	6	1	6
Final exam	Examination		1	3	3
		Preparing exam	15	1	15
			Total load of the course		125
			No. unites		

Code	Course/Module Title	ECTS	Semester
	Engineering Mechanics: Statics 2	5	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	5	78	47
Description			
This course enables students to be prepared to the next step of their study of mechanical engineering. Because of the extremely powerful relation between the subjects of this course and that of the next level courses.			

Module Information

معلومات المادة الدراسية

Module Title	Fluid Mechanics 1			Module Delivery	
Module Type	C			☒ Theory ☒ Lecture ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MEC0014				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGI	Semester of Delivery		
Administering Department		Mechanical	College	Engineering	
Module Leader	Ahmed Abdul-Rida Yaseen Al-Waaly		e-mail	aalwaaly@uowasit.edu.iq	
Module Leader’s Acad. Title		Prof. Asst.	Module Leader’s Qualification		Ph.D.
Module Tutor	Ahmed Abdul-Rida Yaseen Al-Waaly		e-mail	aalwaaly@uowasit.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		16-09-2024	Version Number		1.0

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	- اطلاع الطلبة على اساسيات ميكانيك الموائع ومصطلحاتها والتعرف التطبيقات العملية - Students are taught the fundamentals of Fluid mechanics, its terminology, and the actual applications - تشجيع الطلبة على البحث عن المعرفة العلمية لتوسيع معلوماته الهندسية و تطبيقات ميكانيك الموائع واشتقاقات معادلات الاستمرارية والزخم. - Encouraging students to pursue scientific information in order to increase their understanding continuity and Navier-Stokes equations. - دراسة اساسيات الجريان المثالي - Basic concept in potential flow. - دراسة الجريان حول الاجسام ذات الاشكال المختلفة مثل الاشكال البيضاوية والنصف دائرية. - Studying the flow around different geometries such oval and half circular body.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	الاهداف المعرفية Cognitive objectives - معرفة اهمية دراسة اساسيات ميكانيك الموائع وتطبيقاته المختلفة في الجانب العملي في الجريان المثالي

	Realizing the value of investigating various principles of potential flow. -معرفة أهمية دراسة اشتقاق معادلات الجريان وتطبيقاتها في تصاميم الاجسام المتحركة Understand the role of derivation of flow equations and their applications of moving bodies. -اكتساب الطالب الثقة للمشاركة في تحليل الانظمة gaining the confidence of a student to engage in systems analysis skill objectives related to the course -تنمية مهارة اكتساب المعلومة والتحليل والاستنتاج Enhancing one's capacity for collecting, analyzing, and conclusion. -تطبيقات ميكانيك الموائع المختلفة في التطبيقات الهندسية Numerous gas dynamics and their applications in engineering.
Indicative Contents المحتويات الإرشادية	12.5 hrs : 12.5 hrs : 12.5 hrs : 12.5 hrs :
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Potential flow theory (Ideal Fluid) • Introduction. • Continuity equation. • Vorticity equation.
Week 2	Basic concept in potential flow. • Stream function. • Potential function.

	• Circulation.
Week 3	Basic Flow Patterns. • Uniform flow. • Source, Sink. • Doublet. • Free vortex
Week 4	Combination of basic flows. • Flow past a half body. • Flow Past a Rankine Oval. • Flow past a cylinder. Flow past a cylinder with circulation.
Week 5	Combination of basic flows. • Flow past a half body. • Flow Past a Rankine Oval. • Flow past a cylinder. Flow past a cylinder with circulation.
Week 6	Navier-Stokes equations. • Introduction. • Derivation. • Laminar flow between parallel plates. Couette flow
Week 7	Midterm exam
Week 8	• Hydrodynamic Lubrication.
Week 9	• Sliding bearing. • Collar bearing.
Week 10	Laminar flow between coaxial rotating cylinders.
Week 11	Boundary Layer theory. • Introduction. • Displacement, Momentum, and Energy thicknesses.
Week 12	• Momentum equation for the boundary Layer.
Week 13	• Laminar boundary layer.
Week 14	• Turbulent boundary Layer. • Transition from Laminar to turbulent flow.
Week 15	• Effect of pressure gradient. • Separation and pressure drag.

Code	Course/Module Title	ECTS	Semester
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	4	63	73

Description
- اطلاع الطلبة على اساسيات ميكانيك الموائع ومصطلحاتها والتعرف على انواع قوانين ميكانيك الموائع للجريان المثالي. - Students are taught the fundamentals of fluid dynamics, its terminology, energy kinds, and the rules of ideal fluid. - تشجيع الطلبة على البحث عن المعرفة العلمية لتوسيع معلوماته الهندسية للتطبيقات العلمية المثالي - Encouraging students to pursue scientific information in order to increase their understanding of different engineering applications of ideal flow.

Module Information					
معلومات المادة الدراسية					
Module Title	GAS DYNAMICS		Module Delivery		
Module Type	C		Theory Lecture Tutorial Practical Seminar		
Module Code	MEC3310				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGI	Semester of Delivery		Three
Administering Department		Mechanical	College	Engineering	
Module Leader	Ahmed Abdul-Rida Yaseen Al-Waaly		e-mail	aalwaaly@uowasit.edu.iq	
Module Leader’s Acad. Title		Prof. Asst.	Module Leader’s Qualification		Ph.D.
Module Tutor	Ahmed Abdul-Rida Yaseen Al-Waaly		e-mail	aalwaaly@uowasit.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		16-09-2024	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	- اطلاع الطلبة على اساسيات ديناميك الغازات ومصطلحاتها والتعرف على التطبيقات العملية - Students are taught the fundamentals of Gas Dynamics, its terminology, and the actual applications - تشجيع الطلبة على البحث عن المعرفة العلمية لتوسيع معلوماته الهندسية و تطبيقات ديناميك الغازات في السرعات الفوق صوتية.

	● Encouraging students to pursue scientific information in order to increase their understanding of different thermal processes in supersonic flow engineering. ● دراسة التأثيرات المتولدة من السرعات المفرط صوتية على الاجسام الطائرة من الطائرات والصواريخ ● study the effect of supersonic flow on flying objects such aero plane and missiles. ● دراسة تأثير الموجات المتولدة الثابتة والمتحركة على حركة الاجسام الطائرة ● Studying the effect of normal shock waves (fixed and moving)
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	الاهداف المعرفية Cognitive objectives 1- معرفة اهمية دراسة اساسيات ديناميك الغازات وتطبيقاته المختلفة في الجانب العملي Realizing the value of investigating various principles of gas dynamics from a practical perspective. 2- معرفة أهمية دراسة الجريان المفرط صوتي على تصاميم الاجسام المتحركة Understand the role of studying of supersonic flow on moving bodies. 3- اكساب الطالب الثقة للمشاركة في تحليل الانظمة gaining the confidence of a student to engage in systems analysis الاهداف المهاراتية الخاصة بالمقرر skill objectives related to the course 4- تنمية اهمية دراسة الاثار المترتبة نتيجة تولد الموجات الصادمة Emphasize the value of learning the effect of shock waves. 5- تنمية مهارة اكتساب المعلومة والتحليل والاستنتاج Enhancing one's capacity for collecting, analyzing, and conclusion.

	6- تطبيقات ديناميك الغازات المختلفة في التطبيقات الهندسية Numerous gas dynamics and their applications in engineering.
Indicative Contents المحتويات الإرشادية	12.5 hrs : 12.5 hrs : 12.5 hrs : 12.5 hrs :

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Basic concepts of compressible flow: Velocity of sound, Mach number, Physical different between flow types
Week 2	The adiabatic steady flow, Stagnation's state, Critical state
Week 3	Isentropic flow in variable Area duct. General feature, Dependence of Mach number on area variation, Mach number possibility at the throat, Critical conditions, Choking.
Week 4	Isentropic flow in a converging nozzle, Isentropic flow in a converging-diverging nozzle, Impulse function, Important notes on isentropic flow and adiabatic flow.
Week 5	Shock Waves.

	Introduction, Governing equations of normal shock waves, non-isentropic flow in converging diverging nozzle, Normal shock wave table.
Week 6	Moving normal shock wave, shock wave strength.
Week 7	Midterm exam
Week 8	Oblique shock wave.
Week 9	Constant Area Duct flow. Frictional flow in constant area duct, Governing equation of frictional flow, Fanno line, Relations for frictional flow.
Week 10	Frictional flow with heat transfer in constant area duct, Governing equation of frictionless flow with heat transfer Rayleigh line.
Week 11	Shock wave with change in stagnation temperature
Week 12	Isothermal flow in long ducts, Performance of long ducts at variable pressure ratios
Week 13	Turbomachinery: Axial Compressor, Centrifugal Compressor.
Week 14	Gas and steam Turbines and jet Engine
Week 15	Impulse Turbine and Radial Reaction Turbine.

Code	Course/Module Title	ECTS	Semester
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	4	63	73
Description			
● اطلاع الطلبة على اساسيات ديناميكا الغازات مصطلحاتها والتعرف على انواع الطاقة وقوانين ديناميكا الغازات. ● Students are taught the fundamentals of gas dynamics, its terminology, energy kinds, and the rules of gas dynamics. ● تشجيع الطلبة على البحث عن المعرفة العلمية لتوسيع معلوماته الهندسية للتطبيقات العلمية لديناميكا الغازات ● Encouraging students to pursue scientific information in order to increase their understanding of different engineering applications of gas dynamics.			

Module Information

معلومات المادة الدراسية

Module Title	Internal combustion Engines1			Module Delivery	
Module Type	Core			☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MEC3306				
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	ا.م.د. نجاد كاظم فرحان		e-mail	nkadhun@uowasit.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		14/09/2025	Version Number		1.0

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Analyze and critique the assumptions and limitations of ideal air-standard cycles (Otto, Diesel, Dual) and apply them for first-order performance estimation. 2. Apply knowledge of real-gas effects, valve timing, heat transfer, and combustion duration to perform detailed analysis of real engine cycles using pressure-volume (P-V) diagrams. 3. Calculate key performance parameters, including Indicated Mean Effective Pressure (IMEP), Brake Mean Effective Pressure (BMEP), mechanical efficiency, volumetric efficiency, and specific fuel consumption from given engine data. 4. Evaluate the thermodynamic properties of conventional and alternative fuels (e.g., gasoline, diesel, ethanol, hydrogen, synthetic fuels) and their impact on combustion and engine design.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this course, students will be able to: 1. Analyze and Critique Thermodynamic Cycles: Evaluate the performance of internal combustion engines by applying ideal air-standard cycles (Otto, Diesel) for initial estimation and then analyzing the significant deviations in real engine cycles caused by factors such as heat transfer, finite combustion duration, valve timing, and blow-by. 2. Design and Evaluate Air & Fuel Handling Systems: Design and select key subsystems for optimized charging efficiency, including evaluating the performance and matching of turbochargers and superchargers, and critically assessing the design and operation of modern fuel injection systems (GDI, Common-Rail). 3. Characterize Combustion Phenomena and Abnormalities: Diagnose and explain the

	complex physics and chemistry of normal and abnormal combustion processes in both Spark-Ignition (SI) and Compression-Ignition (CI) engines, including knock, pre-ignition, and the factors controlling ignition delay and combustion stability. - Analyze Emissions Formation and Control Strategies: Identify the precise formation mechanisms of major pollutants (NO_x, CO, UHC, PM) within the cylinder and evaluate the operating principles, efficiency, and limitations of corresponding aftertreatment technologies (TWC, DPF, SCR, EGR) used to mitigate them. - Interpret Engine Performance and Integration: Utilize engine performance maps (e.g., BSFC contours) to optimize engine operation for a given application and critically evaluate the role and optimization strategies for internal combustion engines within hybrid-electric powertrain architectures. - Synthesize Knowledge for Advanced Concepts and Future Trends: Propose and assess advanced combustion strategies (e.g., HCCI, RCCI) for achieving high efficiency and low emissions, and synthesize technical, environmental, and regulatory factors to debate the future evolution of the internal combustion engine.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Foundational Review and Thermodynamic Analysis (Total: 18 hrs)</u> - Introduction to the Modern ICE & its Role in Future Energy Systems (4 hrs). - Ideal Thermodynamic Cycles (Otto, Diesel, Dual) - Analysis, Calculations, and Comparative Evaluation (4 hrs). - Real Engine Cycle Deviations: Heat Transfer, Finite Combustion, Crevice Effects, and Gas Exchange Processes (6 hrs). - Engine Performance Parameters: In-depth analysis of IMEP, BMEP, Mechanical & Volumetric Efficiency, and BSFC (6 hrs). <u>Part B - Air Handling and Fuel Systems (Total: 18 hrs)</u> - Volumetric Efficiency: Detailed analysis of breathing performance, inlet/exhaust tuning, and 1D flow simulation concepts (4 hrs). - Principles of Forced Induction: Turbocharging (pulse and constant pressure), supercharging, and detailed compressor/turbine matching strategies (4 hrs). - Advanced Valve Train Systems: Mechanics and benefits of Variable Valve Timing (VVT) and Lift (VVL), and their impact on engine cycles (3 hrs). - Advanced Fuel Systems: In-depth study of Gasoline Direct Injection (GDI) spray formation and mixture preparation, and Common-Rail Diesel injection technology (3 hrs). Tutorial (4 hrs): Calculations on turbocharger matching, designing valve event profiles for specific outcomes, and analyzing injection spray data. <u>Part C - Combustion Science and Analysis (Total: 18 hrs):</u> - Spark-Ignition (SI) Combustion: Laminar and turbulent flame propagation, flame speed theories, and ignition systems (4 hrs). - SI Abnormal Combustion: Detailed chemical kinetics of end-gas autoignition (knock), pre-ignition sources, and control strategies (3 hrs). - Compression-Ignition (CI) Combustion: Physics of diesel spray break-up, vaporization, air entrainment, and the concepts of premixed and mixing-controlled combustion phases (3 hrs). - Combustion Diagnostics: Theory and application of cylinder pressure transducers, detailed heat release rate (HRR) analysis, and introduction to optical diagnostics (3 hrs). - Tutorial (3 hrs): Practical sessions on processing real cylinder pressure data to

	calculate HRR, diagnose combustion anomalies, and estimate mass fraction burned. Part D - Emissions Formation and Aftertreatment Systems (Total: 18 hrs): • Pollutant Formation Chemistry: Detailed chemical kinetics pathways for Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Unburnt Hydrocarbons (UHC), and Particulate Matter (PM/Soot) formation (6 hrs). • In-Cylinder Emissions Control: Advanced application of Exhaust Gas Recirculation (EGR), air-fuel ratio, and combustion chamber design for minimization (6 hrs). • Aftertreatment Systems: Detailed operating principles, conversion efficiency maps, and design challenges of Three-Way Catalysts (TWC), Diesel Oxidation Catalysts (DOC), Diesel Particulate Filters (DPF), and Selective Catalytic Reduction (SCR) systems (6 hrs). • Tutorial (7 hrs): Case studies on designing EGR systems, calculating catalyst space velocity, and evaluating aftertreatment system efficiency under different engine conditions. Total hrs = 75 = SSWL - (Exam hrs) = 75-3 = 72 hr (Time table hrs x 15 weeks)
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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.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

Material Covered

Week 1	INTRODUCTION TO INTERNAL COMBUSTION ENGINES: Classification of I.C. Engines, Working Cycles, Four Stroke Cycle Engines, Two Stroke Cycle Engines,
Week 2	Comparison of Four Stroke and Two Stroke Cycle Engines, Comparison of Spark Ignition (S.I.) and Compression Ignition (C.I.) Engines
Week 3	AIR STANDARD CYCLES: Air Standard Efficiency, Constant Volume or Otto Cycle
Week 4	Constant Pressure or Diesel Cycle
Week 5	Dual Combustion Cycle, Comparison of Otto, Diesel and Dual Combustion Cycles, Efficiency versus compression ratio
Week 6	FUEL-AIR AND ACTUAL CYCLES: Factors considered for fuel-air cycle calculations; Assumptions made for fuel-air cycle analysis
Week 7	Dissociation, Effect of variation of specific heats,
Week 8	Thermal efficiency and fuel consumption, Effect of common engine variables
Week 9	COMBUSTION IN S.I. ENGINES: Ignition limits, Combustion Phenomenon, Normal combustion
Week 10	Abnormal combustion, Effect of Engine Variables on Ignition Lag,
Week 11	Spark Advance and Factors
Week 12	Affecting Ignition Timing, Pre-ignition, Detonation
Week 13	TESTING AND PERFORMANCE OF I.C. ENGINES,
Week 14	Performance Parameters
Week 15	Performance Parameters
Week 16	Preparatory week before the final Exam

Module Information					
معلومات المادة الدراسية					
Module Title	Electrical Machines		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	B		☐ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC3318				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level		UGIII	Semester of Delivery		Six
Administering Department		Mechanical	College	Engineering	
Module Leader	م م رند جعفر		e-mail	rjudoou@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	Module Leader's Qualification		Msc
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval		25-6-2023	Version Number	1.0	

Date			
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Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	12. Introducing the basic principles of electrical machines. 13. Understand the magnetic field, the reluctance of magnetic materials and air gap. 14. Understand The voltage-current characteristics, voltage regulation of DC generators, speed regulation of DC motors 15. Working principles, construction and operation of dc generator, dc motor and single phase transformers will be studied. 16. Introduction to AC machines 6. To analyze performance aspects of various testing methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Student will be able to: 18. Explain construction, working principle in DC Machines - Generator, Motor and AC Machines-Transformer. 19. Understand different excitation methods of DC machines. 20. Classify various machines and understand - characteristics, performance parameters of DC generators, DC motors, transformer, 21. Analyze voltage-current characteristics, commutation of DC generators and speed regulation of DC motors 22. Analyze various performance parameters of above machines. 23. Solve complex problems in machines which is useful for competitive exams.
Indicative Contents المحتويات الإرشادية	Inductive contents include the following: • Electromagnetic, magnetic field, reluctance & air gap • DC machines (dc generator), construction, working principle, emf equation & type of dc generator. • Characteristics of dc generator(o.c. characteristics, external, self excited series excited characteristics • Application of dc machine • Losses in dc machine • DC machines (dc motor), construction, working principle, back emf equation & type of dc motor • Torque, armature torque& shaft torque, • Speed of dc motor • Ac machine • construction, working principle of transformer

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- Giving theoretical lectures directly in the classroom. 2- Reports and studies. 3- Using clarification tools 4- Direct discussion by asking questions and opening the door for dialogue and interaction with students 5- Developing and enhancing the student's thinking skill and moving him to a higher level of thinking 6- Raising the spirit of cooperation and working within a team 7- Bringing out creative ideas among students by raising the spirit of competition
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Electromagnetic theory
Week 2	DC machine (generator) (Quiz-1)
Week 3	Armature windings, types of dc generator
Week 4	EMF equation of generator, Dc generator characteristics (Quiz-2)
Week 5	Applications of dc generators, Critical Field resistance for a shunt generator
Week 6	Armature reaction (Quiz-3)
Week 7	Losses in a DC machine, DC motor principle, back emf, condition for max.power
Week 8	Mid Exam
Week 9	DC motor principle, back emf, condition for max.power
Week 10	Type of DC Motor

Week 11	Torque, armature torque& shaft torque,
Week 12	Speed of dc motor
Week 13	AC machines (Quiz-4)
Week 14	Transformer
Week 15	Transformer
Week 16	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Electrical Machines	3	Six
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	2	33	42
Description			
The machines which are operated in relation with electrical energy are called electric machines or electrical machines. In electrical machines, either input or output or both can be electricity. The electric machines are of three main types, transformer, generator, and motor. Electrical Transformer: In the transformer, both input and output are electrical power. Electrical Generator: In a generator, the input is mechanical power and the output is electrical power. Electrical Motor: In a motor, the input is electrical power and output is mechanical power. Electrical Machines can also be categorized as static machine and dynamic machine. The transformer is an example of static electrical machine. Motor and generator both are dynamic electrical machine. When a conductor is moved in a magnetic field, emf is induced in the conductor. This is the principle of dynamically induced emf. Depending on that principle, all electrical generators work. There are two types of generator – DC generator, AC generator or alternator. DC Generator: In DC generator armature (assembly of conductors) is the rotor and electromagnetic poles are attached on the stator. When the rotor rotates in the stator alternating current is induced in the armature and collected through commutator segments attached to the shaft of the motor. The generated alternating current in the armature gets converted to direct current through commutator. The electric motors can categorised as a DC motor or an AC motor. DC Motor: these motors are fed by DC supply through commutator segments attached to the shaft of the motor. The motor rotates on basis of Fleming's left hand rule. DC motor can be categorised as separately excited DC motor, shunt wound DC motor, series wound DC motor, compound wound DC motor. At the end of the course the student will be able to: explain construction and operation principle of dc motors and dc generators			

- Describe the working principle of a DC motor and a DC generator.
- List and describe the main components of a DC generator.
- Describe the operation of, and factors affecting output and direction of current flow in DC generators.
- Describe the operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors.
- Describe the difference between motors and state the use of series wound, shunt wound and compound DC motors.
- explain construction and operation principle of transformers
- Describe the principle of transformer and state power losses.
- Know different types of transformers.

Module Information					
معلومات المادة الدراسية					
Module Title	Design of Machine Elements 1		Module Delivery الرجاء الاستفادة من الجدول اخر صفحة		
Module Type			☐ X Theory ☐ xLecture ☐ Lab ☐ xxTutorial ☐ Practical ☐ Seminar		
Module Code	MEC3302				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level		UGIII	Semester of Delivery		Five
Administering Department		Mechanical	College	Engineering	
Module Leader	ا.م.د. علي فرج حمادي		e-mail	alifaraj@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Prof.	Module Leader's Qualification		PhD
Module Tutor			e-mail	alifaraj@uowasit.edu.iq	
Peer Reviewer Name				e-mail	
Scientific Committee Approval Date				Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Coverage of the fundamentals of machine design, including process design, mechanical engineering and materials, and failure prevention under constant and variable load 2. Provide a practical approach to this topic through a wide range of real-world applications and examples. 3. Encouraging students on the relationship between design and analysis. 4. Encouraging students to link the basic concepts with the specifications of the process element. 5. Teaching methods of selecting engineering materials and machine dimensions. 6. Calculating the stresses in each part of the machine. 7. Propose correct solutions for the design of the machine. 8. Identify the engineering applications for each part of the machine. 9. Give the student many examples and case studies to design it.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Knowing the importance of studying design in the practical and industrial aspects 2- Knowing the role of design and modernization in the quality and efficiency of machines 3- Giving the student the confidence to participate in the design of any part of the machines.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction of Machine Design: Definition, Classifications of Machine Design, General Considerations in Machine Design, General Procedure in Machine Design. Review of stresses and strain: Tensile Stress and Strain, Compressive Stress and Strain, Young's Modulus or Modulus of Elasticity, Shear Stress and Strain , Shear Modulus or Modulus of Rigidity, Bearing Stress, Stress-Strain Diagram, Working Stress ,Factor of Safety, Selection of Factor of Safety, Stresses in Composite Bars, Stresses due to Change in Temperature—Thermal Stresses. [6 hrs] Review of Torsional Shear and Bending Stress: . Torsional Shear Stress, Bending Stress in Straight Beams, Bending Stress in Curved Beams, Principal Stresses and Principal Planes. [6 hrs] Theories of Failure under Static Load: Maximum Principal or Normal Stress Theory (Rankine's Theory), Maximum Shear Stress Theory (Guest's or Tresca's Theory), Maximum Principal Strain Theory (Saint Venant's Theory), Maximum Strain Energy Theory (Haigh's Theory), Maximum Distortion Energy Theory (Hencky and Von Mises Theory). [6 hrs] Variable Stress in machine parts: Completely Reversed or Cyclic Stresses, Fatigue and Endurance Limit, Factor of Safety for Fatigue Loading. [6 hrs] Stress Concentration: Theoretical or Form Stress Concentration Factor, Fatigue Stress Concentration Factor, Combined Steady and Variable Stresses, Gerber Method for Combination of Stresses, Goodman Method for Combination of Stresses, Soderberg Method for Combination of Stresses. [9 hrs]
	Design of Shafts : Types of Shafts, Stresses in Shafts, Maximum Permissible Working Stresses for Transmission Shafts, Shafts Subjected to Twisting Moment Only, Shafts Subjected to Bending Moment Only, Shafts Subjected to Combined Twisting Moment and Bending Moment, Shafts Subjected to Fluctuating Loads, Shafts Subjected to Axial Load in addition to Combined Torsion and Bending Loads, Design of Shafts on the Basis of Rigidity. [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 by considering type of simple experiments involving some sampling activities that are interesting to the students.

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of Machine Design
Week 2	Simple stress in Machine parts
Week 3	Simple stress in Machine parts
Week 4	Torsion & bending in machine parts
Week 5	Torsion & bending in machine parts
Week 6	Variable Stresses in Machine parts 1
Week 7	Variable Stresses in Machine parts 1
Week 8	Variable Stresses in Machine parts 2
Week 9	Design of Shafts
Week 10	Keys
Week 11	Mid-term Exam
Week 12	Coupling
Week 13	Coupling
Week 14	Preparatory week before the final Exam
Week 15	final Exam
Week 16	

Code	Course/Module Title	ECTS	Semester
	Design of Machine Elements 1	3	Five
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	1	48	27

Description
Introduction of Machine Design: Definition, Classifications of Machine Design, General Considerations in Machine Design, General Procedure in Machine Design. Review of stresses and strain: Tensile Stress and Strain, Compressive Stress and Strain, Young's Modulus or Modulus of Elasticity, Shear Stress and Strain, Shear Modulus or Modulus of Rigidity, Bearing Stress, Stress-Strain Diagram, Working Stress, Factor of Safety, Selection of Factor of Safety. Review of Torsional Shear and Bending Stress: Torsional Shear Stress, Bending Stress in Straight Beams, Bending Stress in Curved Beams. Theories of Failure under Static Load: Maximum Principal or Normal Stress Theory (Rankine's Theory), Maximum Shear Stress Theory (Guest's or Tresca's Theory), Maximum Principal Strain Theory (Saint Venant's Theory), Maximum Strain Energy Theory (Haigh's Theory), Maximum Distortion Energy Theory (Hencky and Von Mises Theory). Variable Stress in machine parts: Completely Reversed or Cyclic Stresses, Fatigue and Endurance Limit, Factor of Safety for Fatigue Loading. Stress Concentration: Theoretical or Form Stress Concentration Factor, Fatigue Stress Concentration Factor, Combined Steady and Variable Stresses, Gerber Method for Combination of Stresses, Goodman Method for Combination of Stresses, Soderberg Method for Combination of Stresses. Design of Shafts: Shafts Subjected to Combined Twisting Moment and Bending Moment, Shafts Subjected to Fluctuating Loads, Shafts Subjected to Axial Load in addition to Combined Torsion and Bending Loads, Design of Shafts on the Basis of Rigidity.

Module Information						
معلومات المادة الدراسية						
Module Title	Design of Machine Elements 2		Module Delivery الرجاء الاستفادة من الجدول اخر صفحة			
Module Type	C		☐ X Theory xLecture ☐ Lab ☐ xxTutorial ☐ Practical ☐ Seminar ☐			
Module Code	MEC3303					
ECTS Credits	3					
SWL (hr/sem)	75					
Module Level		UGIII	Semester of Delivery		Six	
Administering Department		Mechanical	College	Engineering		
Module Leader		ا.م.د. علي فرج حمادي		e-mail	alifaraj@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Prof.		Module Leader's Qualification		PhD
Module Tutor				e-mail	alifaraj@uowasit.edu.iq	
Peer Reviewer Name				e-mail		
Scientific Committee Approval Date				Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Coverage of the fundamentals of machine design, including process design, mechanical engineering and materials, and failure prevention under constant and variable load 2. Provide a practical approach to this topic through a wide range of real-world applications and examples. 3. Encouraging students on the relationship between design and analysis. 4. Encouraging students to link the basic concepts with the specifications of the process element. 5. Teaching methods of selecting engineering materials and machine dimensions. 6. Calculating the stresses in each part of the machine. 7. Propose correct solutions for the design of the machine. 8. Identify the engineering applications for each part of the machine. 9. Give the student many examples and case studies to design it.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Knowing the importance of studying design in the practical and industrial aspects 2- Knowing the role of design and modernization in the quality and efficiency of machines 3- Giving the student the confidence to participate in the design of any part of the machines.

Indicative Contents المحتويات الإرشادية	Design of Riveted Joints: Failures of a Riveted Joint, Strength of a Riveted Joint, , Design of Boiler Joints, Riveted Joint for Structural Use–Joints of Uniform Strength (Lozenge Joint), Eccentric Loaded Riveted Joint. [12 hrs] Design of Screwed Joints: Stresses in Screwed Fastening due to Static Loading, Design of Cylinder Covers, Boiler Stays, Bolts of Uniform Strength, Bolted Joints under Eccentric Loading. [12 hrs] Design of Welded Joints: Stresses for Welded Joints, Stress Concentration Factor for Welded Joints, Axially Loaded Unsymmetrical Welded Sections, Eccentrically Loaded Welded Joints. [12 hrs] Design of Pressure Vessels: Stresses in a Thin Cylindrical Shell due to an Internal Pressure, Thin Spherical Shells Subjected to an Internal Pressure, Thick Cylindrical Shell Subjected to an Internal Pressure, Cylinder Heads and Cover Plates. [12 hrs]
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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.

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Pressure Vessels
Week 2	Pressure Vessels
Week 3	
Week 4	Riveted Joints
Week 5	Riveted Joints
Week 6	Riveted Joints
Week 7	Screwed Joints
Week 8	Screwed Joints

Week 9	Welded Joints
Week 10	Welded Joints
Week 11	Mid-term Exam
Week 12	Springs
Week 13	Springs
Week 14	Preparatory week before the final Exam
Week 15	final Exam
Week 16	

Code	Course/Module Title	ECTS	Semester
	Design of Machine Elements 1	3	Five
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL
			(hr/sem)
2	1	48	27
Description			
Introduction of Machine Design: Definition, Classifications of Machine Design, General Considerations in Machine Design, General Procedure in Machine Design.			
Review of stresses and strain: Tensile Stress and Strain, Compressive Stress and Strain, Young's Modulus or Modulus of Elasticity, Shear Stress and Strain, Shear Modulus or Modulus of Rigidity, Bearing Stress, Stress-Strain Diagram, Working Stress, Factor of Safety, Selection of Factor of Safety. Review of Torsional Shear and Bending Stress: Torsional Shear Stress, Bending Stress in Straight Beams, Bending Stress in Curved Beams.			
Theories of Failure under Static Load: Maximum Principal or Normal Stress Theory (Rankine's Theory), Maximum Shear Stress Theory (Guest's or Tresca's Theory), Maximum Principal Strain Theory (Saint Venant's Theory), Maximum Strain Energy Theory (Haigh's Theory), Maximum Distortion Energy Theory (Hencky and Von Mises Theory). Variable Stress in machine parts: Completely Reversed or Cyclic Stresses, Fatigue and Endurance Limit, Factor of Safety for Fatigue Loading.			

Stress Concentration: Theoretical or Form Stress Concentration Factor, Fatigue Stress Concentration Factor, Combined Steady and Variable Stresses, Gerber Method for Combination of Stresses, Goodman Method for Combination of Stresses, Soderberg Method for Combination of Stresses.

Design of Shafts: Shafts Subjected to Combined Twisting Moment and Bending Moment, Shafts Subjected to Fluctuating Loads, Shafts Subjected to Axial Load in addition to Combined Torsion and Bending Loads, Design of Shafts on the Basis of Rigidity.

Module Information					
معلومات المادة الدراسية					
Module Title	Human rights and Democracy		Module Delivery		
Module Type	Basic		☒ Theory ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	WU04				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		UGI	Semester of Delivery		Two
Administering Department		WAR	College	College of Engineering	
Module Leader	Entidar Rasheed Izewaer		e-mail	inrasheed@uowasit.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name			e-mail	none	
Scientific Committee Approval Date		20/06/2025	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	A- Cognitive goals 1- Acquiring the skill of distinguishing between states' relations with their citizens. 2- Dealing with the concept of human rights. 3- Acquisition of knowledge in dealing with problems affecting those rights. 4- Gaining knowledge of the origins and roots of human rights. 5- Reaching knowledge of the practical application of human rights. 6- Developing the student's ability to perform assignments and deliver them on time. 7- Logical thinking to find solutions to the problems facing students in society, especially with the increase in societal problems such as domestic violence, electronic extortion, and the spread of drug abuse. The Iraqi and the extent of his demand for the maintenance and preservation of those rights. 8- View the data on the Iraqi constitution and the extent to which it is required to maintain and preserve those rights.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Graduating a generation that is aware, educated, and aware of its duties as an individual in society and the state, and its rights in exchange for those duties. 2- Developing in society a culture of respect for the other, regardless of his beliefs, personal inclinations, attitudes, and societal behaviors. 3- Referring first and foremost to the law regarding any offensive phenomena that may prevail in the work environment. 4- Developing the student's ability to dialogue and discussion. 5- It has a major role in analyzing emerging problems in society. 6- It contributes to increasing students' knowledge of how to prepare scientific reports.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- Developing the student's ability to deal with societal problems. 2- Developing the student's ability to deal with the analysis of laws and the mechanisms of their application. 3- Developing the student's ability to deal with the multiple means available in the work environment. 4- Developing the student's ability to dialogue and discussion. 5- Developing the student's ability to employ his study tools as practical tools in the work environment. 6- Developing the ability to harmonize between the different conditions that prevail in the work atmosphere in proportion to the ability of the labor market to absorb the different conditions.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Managing the lecture in such a way that the student feels the importance of time. 2- Assigning the student some group activities and duties. 3- Allocate a percentage of the grade for group activities. 4- Developing the topic of group campaigns that shed light on negative societal phenomena and the role of students as active individuals in society. 5- Active participation in the classroom is evidence of the student's commitment and responsibility. 6 Commitment to the deadline for submitting the assignments and reports required of the student to submit them. 7- Quarterly and final exams reflect commitment and knowledge and skill achievement.

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The nature of human rights.
Week 2	Human rights in Islam.
Week 3	Human rights in modern political thought.
Week 4	Human rights in contemporary political thought.
Week 5	Human rights in international conventions
Week 6	Human rights in the Iraqi constitution in force
Week 7	Human rights violations in multiple experiences with the Universal Declaration of Human Rights
Week 8	Legal rights in the International Covenant on Civil and Political Rights
Week 9	Types of rights mentioned in the Iraqi constitution in force with the provisions of the Iraqi constitution related to rights and freedoms
Week 10	The historical development of the concept of democracy in the civilization of the Mesopotamia Greek civilization and Roman civilization.
Week 11	The difference between freedom and democracy
Week 12	Islamic views in the democratic system of government
Week 13	Forms of democracy and conditions for the success of the democratic system
Week 14	Elements and pillars of the democratic system
Week 15	Preparatory week before the final Exam

جدول الساعات المجدولة و غير المجدولة لمادة

Human rights and Democracy

نوع النشاط	الساعات المجدولة SSWL	الساعات غير المجدولة USSWL	عدد الأسابيع	ساعة لكل أسبوع	العبء الكلي للتشاط
محاضرات	محاضرات في القاعات الدراسية		15	2	30
المختبر	دوام المختبر				
مناقشات	المناقشات		0	0	0
واجب بيتي			0	0	0
انجاز التقرير		التهيئة للواجب البيبي	2	1	2
العروض التقديمية	القاء العرض التقديمي	تحضير التقرير	3	1	3
الامتحانات اليومية		التهيئة للعرض التقديمي	0	0	0
امتحان نصف الفصل	الامتحان	التهيئة للامتحانات اليومية	2	1	2
امتحان نهاية الفصل	الامتحان		0	0	0
		التهيئة للامتحان	4	4	1
		التهيئة للامتحان	3	3	1
		التهيئة للامتحان	6	6	1
		العبء الكلي للمادة خلال الفصل:	50		
		عدد الوحدات:	2		

*لا توجد ساعات مجدولة لهذه النشاطات كون تم استيفائها ضمن الصفوف الدراسية.

Module Information					
معلومات المادة الدراسية					
Module Title	Mathematics 1			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	COE01				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UG1	Semester of Delivery		1
Administering Department		Civil	College	Engineering	
Module Leader	Assis.Prof. Hiba D. Saleem		e-mail	hdawood@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Professor	Module Leader's Qualification		MSc
Module Tutor	Lecturer. Aqeel Abboud Abdulhassan		e-mail	aqeel@uowasit.edu.iq	
Peer Reviewer Name		1- Dr. Ali Asaad Tayeb 2- Dr. Alaa Sabeh Taeh 3- Lect. Abdalameer Tariq Abbas	e-mail		
Scientific Committee Approval Date		9/11/2025	Version Number		1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Providing the students with a sufficient knowledge on doing calculations, interpreting results, and dealing with different mathematical functions and their graphs. 2. Providing the students with the necessary skills on dealing with transcendental functions (trigonometric, inverse trigonometric, exponential, and power, natural logarithm, hyperbolic, inverse hyperbolic functions). 3. Strengthen the students' knowledge on the principles of derivatives, their concept and applications in engineering. 4. Providing the students with a sufficient knowledge on the principles of integral (definite and indefinite), its meaning, mathematical techniques such as Trapezoidal and Simpson approximation of integrals and eventually the engineering applications of it. 5. Improvement of the students' skills on the dealing with complex equations and numbers in simple and different mathematical ways. 6. Awarding students the necessary skills of connecting the academic mathematics with real worlds engineering problems. 7. How to solve integrals and differentials equations with different coordinates. 8. Analyze equations using the matrix method. 9. Developing students' skills in the calculation of the area between curves, surface area of revolution, volume of revolution, length of curve.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Realize the importance of studying mathematics and its relationship to engineering sciences. 2. Defining and understanding functions such as the trigonometric and transcendental functions and their graph. 3. The students will have the ability for dealing with limits and how to check the continuity of the functions. 4. Define and find the relationship between Limits, Continuity and derivatives. 5. The students will be able to solve a wide variety of mathematical derivative problems using different mathematical methods and understand their applications. 6. The students will be able to solve a wide variety of mathematical integration problems using substitution and integration by parts. 7. To be able to use the fundamental theorem of calculus to evaluate definite integral and calculate the areas, volumes, lengths of plane curves. 8. Learn about mathematical analysis methods, mathematical equations and formulas, and how to apply them in engineering. 9. Solving complex functions. 10. Solving integrals and differentials equations with different coordinates. 11. Solving different equations using the matrix method. 12. Solving complex equations and numbers in simple and different mathematical ways.
	Part A (16hr) Functions: types (such as Algebraic, Trigonometry, Hyperbolic and their inverse), Domain and range, and Graphing of equations.
Indicative Contents المحتويات الإرشادية	Part B (10 hr) Limits and continuity of functions Part C (20 hr) Derivative: principles, their rules such as chain rule, its applications for different functions including Trigonometric, Inverse trigonometric, hyperbolic, and Logarithmic and exponential functions. Part D (12 hr) Integrals: its rules, methods of solve different functions (Trigonometric, Inverse trigonometric, hyperbolic, and Logarithmic and exponential functions), and its applications such as Areas between curves, Volumes of revolution, Length of the curve, Surface Area of revolution. Methods of Integration: Trigonometric Substitution, Quadratics, Partial Fractions, Integration by parts, Further Substitutions.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Class lectures with using illustration means. 2. Encouraging the students to participate in solving exercises in class to improve students' skills. 3. Training students on solving home works 4. Practicing in class questions and discussions 5. Doing quizzes and exams 6. In class questions and discussions to improve their understanding and critical thinking skills. 7. Supportive videos will also be available.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Brief review
Week 2	Domain and range of functions.
Week 3	Functions and their graphs.
Week 4	Functions and their graphs.
Week 5	Limits and continuity of functions.
Week 6	Limits and continuity of functions.
Week 7	Mid term
Week 8	Derivatives of functions - Rules of derivatives. - Chain rule. - Implicit derivatives. - Higher derivatives.
Week 9	Trigonometric functions - Properties , Derivatives Rules
Week 10	Inverse trigonometric functions - Properties, Derivatives Rules.
Week 11	Hyperbolic functions - Properties, Derivatives Rules.
Week 12	Application of Derivatives. - Velocity and acceleration. - Equation of tangent.
Week 13	Integrals - Integration formulas - Integration of logarithmic and exponential functions.
Week 14	Integration of Trigonometric, Inverse trigonometric, and Hyperbolic functions
Week 15	Integration of Trigonometric, Inverse trigonometric, and Hyperbolic functions
Week 16	Preparatory week before the final Exam

Unstructured SWL			
Activities	Number of weeks	(h/w)	Total hours
Preparation for class	15	2	30
Solving homework	7	1	7
Preparation for Quizzes	3	3	9
Preparation for Mid-term exam	1	6	6
Preparation for Final exam	1	10	10
Total USSWL			62

Description
Qualifying, training and teaching the student on the rules and methods of derivative of various functions and their mathematical applications in our daily lives and benefiting from them in the curriculum of advanced mathematics for the second stage and then in the third stage while solving different equations and linking them with the rest of the other topics. Calculus lectures in the first course are given in two parts, the first one in the classroom which involve 3 theoretical hours and 1 hour of discussion to clarify the topics in more detail each week which is defined SSWL (structural student work load) and the second part is defined as USSWL (unstructured student work load) which include all activity out the class.

Module Information					
معلومات المادة الدراسية					
Module Title	اللغة العربية		Module Delivery		
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	WU01				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		UGI	Semester of Delivery		Second
Administering Department			College	College of Engineering	
Module Leader	زينب دايع مطر		e-mail	Zainabd303@uowasit.edu.iq	
Module Leader's Acad. Title		مدرس	Module Leader's Qualification		PhD.
Module Tutor			e-mail		
Peer Reviewer Name		مشتاق كاظم جمعة	e-mail	mjmaah@uowasit.edu.iq	
Scientific Committee Approval Date		2025-11-9	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- المهارة اللغوية للطلبة و تمكينهم من التعبير عن أفكارهم و مشاريعهم باللغة العربية و بطلاقة. Linguistic proficiency of students by enabling them to express their ideas and projects in fluent Arabic. 2- تجنب الطلبة التحدث باللغة الدارجة او الكلمات غير العربية Students avoid speaking in colloquial and non-Arabic language in the simplest ways. 3- كتابة التقارير والمقالات باللغة العربية و بشكل انسيابي و دقيق و منظم Writing reports and articles in fluent, concise and well-organized Arabic. 4- استخدام قواعد اللغة العربية بشكل صحيح لان اللغة هي الاداة الأساسية للتواصل بين افراد المجتمع. Use Arabic grammar correctly; Because language is the primary tool of communication between members of society.

	5- قراءة وفهم النصوص الأكاديمية باللغة العربية. Reading and understanding academic texts in Arabic. 6- تطوير قابلية الطلبة على أداء المهام وتقديمها في الوقت المطلوب. Developing the student's ability to perform assignments and submit them on time.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	عند الانتهاء من هذا الفصل، سيكون الطلاب قادرين على: 1- إجادة القراءة والكتابة والتحدث باللغة العربية. 2- استخدام اللغة العربية للتواصل بفعالية في الأوساط الأكاديمية والمهنية. 3- التعرف على التعبيرات اللغوية والأدبية. 4- إظهار فهم لأهمية مهارات اللغة العربية للنجاح في الهندسة. 5- تطبيق مهارات التفكير النقدي وحل المشكلات في مواقف العالم الحقيقي. 6- يساهم في زيادة معرفة الطلاب بكيفية إعداد التقارير العلمية. Upon completion of this course, students will be able to: 1- Demonstrate proficiency in reading, writing, and speaking to Arabic. 2- Use Arabic to communicate effectively in academic and professional settings 3- Gain an understanding of linguistic and literary expressions 4- Demonstrate an understanding of the importance of Arabic language skills for success in engineering 5- Apply critical thinking and problem-solving skills to real-world situations 6- It contributes to increasing students' knowledge of how to prepare scientific reports.
Indicative Contents المحتويات الإرشادية	Part A: Grammar (12.5 hr) Part B: Reading (12.5 hr) Part C: Writing (12.5 hr) Part D: Speaking (12.5 hr)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• تقديم المحاضرات النظرية وتحديد المعلومات الأكثر أهمية من خلال استخلاص الكلمات المفتاحية والأفكار. • يتم منح الطلاب فرصاً لإنتاج اللغة، وتلقي تعليقات مباشرة لتحسين مهاراتهم اللغوية. • Present theoretical lectures and determine the information that is most significant by extracting keywords and ideas. • Students are given opportunities to produce language, and receive direct feedback to improve their language skills.

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	20	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Grammar: Speech and what it consists of: the noun, the verb, and the letter. First: the verb and its parts, its signs, and the past tense. النحو: - الكلام وما يتكون منه: الاسم، والفعل، والحرف. أولاً: الفعل وأجزائه، وعلاماته، والفعل الماضي.
Week 2	Grammar: objects of all kinds, adverbs, their types and conditions. Speech and what it النحو: المفاعيل بأنواعها، والحال، وأنواعه وشروطه
Week 3	Literature: poetic text and prose text, study and analysis الأدب: نص شعري ونص نثري دراسة وتحليل
Week 4	Grammar: subject and the news, types of subject and its rulings, definition of the news and its types. النحو: المبتدأ والخبر، أنواع المبتدأ وأحكامه، تعريف الخبر وأنواعه.
Week 5	Spelling: The difference between dād, dha, sīn and sūf املاء: الفرق بين الضاد والطاء والسين وسوف.
Week 6	Grammar: Inna and its sisters, the five verbs. النحو: إن وأخواتها، الأفعال الخمسة.

Week 7	Grammar: Plural of the sound masculine and the attached to it. النحو: جمع المذكر السالم والملحق به.
Week 8	Literature: reading and analyzing prose text. الادب: قراءة وتحليل النص النثري.
Week 9	Mid exam
Week 10	Qur'anic texts, lessons in Islamic education, interpretation and rhetorical miracles النصوص القرآنية دروس في التربية الإسلامية والتفسير والإعجاز البلاغي
Week 11	Spelling: Rules for writing Hamza الاملاء: قواعد كتابة الهمزة
Week 12	Spelling: The rules for writing an alif at the end of a word الاملاء: كتابة قواعد كتابة الالف في نهاية الكلمة
Week 13	Grammar: Common linguistic errors النحو: الأخطاء اللغوية الشائعة
Week 14	Grammar: the verbal sentence, the subject and its deputy النحو: الجملة الفعلية والفاعل ونائبه
Week 15	Public lecture and discussions محاضرة و مناقشات عامة

جدول الساعات المجدولة وغير المجدولة لمادة

Arabic Language

نوع النشاط	الساعات المجدولة SSWL	الساعات غير المجدولة USSWL	عدد الأسابيع	ساعة لكل أسبوع	العبء الكلي للمنشاط
محاضرات	محاضرات في الفاعات الدراسية		15	2	30
المختبر	دوام المختبر		0	0	0
مناقشات*	المناقشات		0	0	0
مشروع عملي*	مشروع عملي		0	0	0
	التهيئة للمشروع		0	0	0
تحضير الدروس اليومي		تحضير الدروس اليومي	10	1	10
العروض التقديمية*	القاء العرض التقديمي		0	0	0
		التهيئة للعرض التقديمي	1	1	1
الامتحانات اليومية	الامتحان		0	0	0
		التهيئة للامتحانات اليومية	2	1	2
امتحان نصف الفصل	الامتحان		0	0	0
		التهيئة للامتحان	2	1	2
امتحان نهاية الفصل	الامتحان		1	1	3
		التهيئة للامتحان	1	2	2
				العبء الكلي للمادة خلال الفصل:	50
				عدد الوحدات:	2

*لا توجد ساعات مجدولة لهذه النشاطات كون تم استيفائها ضمن الصفوف الدراسية.

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Programming 1		Module Delivery
Module Type	Selective		☒ Theory Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar ☐
Module Code	MEC0018		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGI	Semester of Delivery	One
Administering Department	WAR	College	College of Engineering
Module Leader	Nihad K. Frhan Al-Abboodi	e-mail	nkadh@uowasit.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1.0
Module Aims, Learning Outcomes and Indicative Contents			
أهداف المادة			
الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدراسية	1. The aim of this Module is to provide the student with : provide you with the fundamental tools to use the C++ computer program . 2. The module will familiarize you with the various C++ packages, their relative strengths and therefore which one to use to solve the problem at hand. This will enable you to work efficiently through all your modules on the programmer, As the C++ Suite remains the dominant office package in the workplace, the skills you obtain here will increase your employability both during your degree (work placement, summer internship) and upon graduation and The ability to plan, develop and test C++ computer programs for a range of routine programming problems.		

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Create and run programs written in a C++ programming language using an integrated development environment. 2. Identify classes and solve routine programming problems. 3. The ability to write an entire paragraph with formatting. 4. Create re-usable software routines in a C++ programming language. 5. Utilizes standard class library functionality.
Indicative Contents المحتويات الإرشادية	Part A (75 hr) C++ programming.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The Computer programming course is rigorous and demands extensive instructional time. Consequently, the course's approach relies heavily on the instructor to deliver the content through practical examples during class. Furthermore, assigning tutorials and homework assignments enables students to practice and improve their software skills in problem-solving. Occasional utilization of practical and test videos aids in establishing connections between various elements of the course. Additionally, visits to intersections serve as a valuable tool to bridge the gap between theoretical concepts and their practical application. 1. Using computers and display screens to explain lectures to students to increase students' mental comprehension. 2. Practical application in the computer lab of what was explained in the theoretical lecture. 3. Using direct questions in the classroom as brainstorming skills. 4. Encouraging students to solve class and homework assignments and to perform specialized reports.
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Chapter One: Introduction To the C ++ Programing Language, Definition Of C ++
Week 2	Chapter One: Interface, C ++ Components.
Week 3	Chapter Two: Type Of Constant and Variable, Comments
Week 4	Chapter Two: Operating Systems, Math.h, Stdio.h, ScanF, String, Quizzes1
Week 5	Chapter Three: C ++ Operation, Input statement
Week 6	Chapter Three: C ++ Operation, Format Outputs, Quizzes2
Week 7	Chapter Four: Control Statement: If Statement
Week 8	Chapter Four: Control Statement: If Statement.
Week 9	Chapter Four: Control Statement: Switch (var)
Week 10	Chapter Five: loops function: For, Quizzes3
Week 11	Chapter Five: loops function: While
Week 12	Chapter Five: Increment value (i++, ++i)
Week 13	Chapter Six : One Dimensional Matrix.
Week 14	Chapter Six: Input and output to the Matrix.
Week 15	Review and a preparatory week before the Final Exam
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Chapter One: Introduction To the C ++ Programing Language, Definition Of C ++
Week 2	Chapter One: Interface, C ++ Components.
Week 3	Chapter Two: Type Of Constant and Variable, Comments
Week 4	Chapter Two: Operating Systems, Math.h, Stdio.h, ScanF, String
Week 5	Chapter Three: C ++ Operation, Input statement
Week 6	Chapter Three: C ++ Operation, Format Outputs
Week 7	Chapter Four: Control Statement: If Statement
Week 8	Chapter Four: Control Statement: If Statement.
Week 9	Chapter Four: Control Statement: Switch (var)
Week 10	Chapter Five: loops function: For
Week 11	Chapter Five: loops function: While
Week 12	Chapter Five: Increment value (i++, ++i)
Week 13	Chapter Six : One Dimensional Matrix.
Week 14	Chapter Six: Input and output to the Matrix.
Week 15	Review and a preparatory week before the Final Exam

جدول الساعات المجدولة و غير المجدولة لمادة

Computer Skills

نوع النشاط	الساعات المجدولة SSWL	الساعات غير المجدولة USSWL	عدد الأسابيع	ساعة لكل أسبوع	العبء الكلي للساعات
محاضرات	محاضرات في القاعات الدراسية		15	2	15
المختبر	دوام المختبر		15	2	30
مناقشات	المناقشات		0	0	0
مشروع عملي	مشروع عملي		0	0	0
	التهيئة للمشروع		0	0	0
انجاز الواجب البيتي	تحضير المشاريع البيتية		3	1	3
العروض التقديمية	القاء العرض التقديمي		0	0	0
	التهيئة للعرض التقديمي		0	0	0
الامتحانات اليومية	التهيئة للامتحانات اليومية		3	2	6
امتحان نصف الفصل	الامتحان		0	0	0
	التهيئة للامتحان		1	6	6
امتحان نهاية الفصل	الامتحان		1	3	3
	التهيئة للامتحان		1	12	12
				العبء الكلي للمادة خلال الفصل:	75
				عدد الوحدات:	6

*لا توجد ساعات مجدولة لهذه النشاطات كون تم استيفائها ضمن الصفوف الدراسية.

Module Information					
معلومات المادة الدراسية					
Module Title	Academic English 1			Module Delivery الرجاء الاستفادة من الجدول آخر صفحة	
Module Type	B			× ☐ Theory Lecture ☐ × Lab ☐ Tutorial ☐ × Practical ☐ Seminar ☐ ×	
Module Code	WU02				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		UGI	Semester of Delivery		Two
Administering Department		Mechanical	College	Engineering	
Module Leader	م د علي فرج حمادي		e-mail	alifaraj@uowasit.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		25-6-2023	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This module provides all the language and skills students need to improve their English, with grammar, vocabulary, and skills work in every unit. The aim is represented by the module's trusted methodology combines solid grammar and practice, vocabulary development, and integrated skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Demonstrate understanding of academic texts and summarise them orally and in writing. 2- Demonstrate an ability to write with a fair degree of accuracy in a variety of genres. 3- cope effectively with everyday situations everywhere in English 4- Demonstrate learner independence and be aware of their own linguistic strengths and weaknesses. 5- Participate in discussions/seminars on a variety of subject related, academic and general topics.
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Reading a range of pre-intermediate level articles on selected general topics. Writing a topic (informal emails, e.g.,) to classmates to discuss group work. Writing and submitting an assignment to a lecturer, Writing slides for presentations. Listening to authentic material at the beginner level to develop listening skills and comprehension. For Speaking, students may self-select and discuss topics with classmates on a group project. Typical topics that could be used at this level in the teaching of vocabulary include The World Around Us (Countries, Nationality, Language, Physical world, Weather, etc.). It may be appropriate for students to select grammar points for discussion in class, or for the lecturer to select them as they arise in students' writing. Grammar points that typically arise at this level include present simple and past simple; present continuous; question forms and auxiliary verbs; comparison; word order; prepositions; basic phrasal verbs.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13333 3333333 3333
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

	Material Covered
Week 1	Unit.1 Hello!
Week 2	Unit.2 Your world
Week 3	Unit.3 All about you
Week 4	Unit.4 Family and friends
Week 5	Unit.5 The way I live
Week 6	Unit.6 Every day
Week 7	Unit.7 My favourites
Week 8	Unit.8 Where I live
Week 9	Unit.9 Times past
Week 10	Unit.10 We had a great time!
Week 11	Unit.11 I can do that!
Week 12	Unit.12 Please and thank you
Week 13	Unit.13 Here and now
Week 14	Unit.14 It's time to go!
Week 15	Presentation (seminars)
Week 16	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Academic English 1	2	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	2	33	17
Description			
The purpose of this module is to develop students' linguistic ability by focusing on the key skills of reading, writing, speaking and listening, to encourage students to become independent learners and to introduce them to strategies and skills to enable them to cope with the demands, both academic and cultural, of undergraduate study in an English-speaking environment.			

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Drawing and Descriptive Geometry 2		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	C		☒ Theory Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar ☐		
Module Code	MEC006				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGI	Semester of Delivery		Two
Administering Department		Mechanical	College	Engineering	
Module Leader	م.د. امير كامل باقر		e-mail	aalhilo@uowasit.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name		م.م ايلاف صادق براك	e-mail	ebarrak@uowasit.edu.iq	
Scientific Committee Approval Date		25-6-2023	Version Number	1.0	
Module Aims, Learning Outcomes and Indicative Contents					
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية					
Module Aims أهداف المادة الدراسية		1. To enhance students' spatial visualization skills, enabling them to translate three-dimensional objects into two-dimensional drawings and vice versa. 2. To encourage students to apply critical thinking and problem-solving techniques to engineering drawing challenges encountered in real-world scenarios. 3. To promote effective communication and collaboration skills among students, allowing them to work in teams and present their design concepts and solutions.			
Module Learning Outcomes مخرجات التعلم للمادة الدراسية		1. Apply geometric construction techniques to accurately create and modify geometric shapes and patterns. 2. Recognize the importance of engineering drawing in mechanical engineering practice and its role in manufacturing, assembly, and design processes.			

Indicative Contents المحتويات الإرشادية	1- Geometric Construction: - Construction of basic geometric shapes (lines, arcs, circles, etc.) - Construction of polygons, tangents, and bisectors - Application of construction techniques in engineering drawing 2- Dimensioning: - Principles of dimensioning, including size and location - Dimensioning methods (unidirectional, aligned, and baseline) 3- Sectional Views and Auxiliary Views: - Creating and interpreting sectional views to represent internal features of objects - Drawing auxiliary views to depict inclined surfaces and irregular objects
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Lectures: Conduct engaging lectures to introduce and explain key concepts, principles, and techniques of engineering drawing. Use visual aids, examples, and demonstrations to enhance understanding. 2- Hands-on Drawing Exercises: Provide regular in-class drawing exercises where students practice creating engineering drawings manually. Assignments can range from simple objects to more complex components and assemblies. 3- Group Discussions and Problem Solving: Encourage group discussions to
	promote peer learning and problem-solving skills. Assign drawing problems or challenges for students to solve collaboratively, discussing different approaches and solutions. 4- Case Studies and Real-World Examples: Present case studies and real-world examples that highlight the importance and practical applications of engineering drawing in mechanical engineering. Discuss challenges faced in industries and how engineering drawings are used to overcome them. 5- Assessments and Feedback: Design formative and summative assessments, such as quizzes, drawing assignments, and examinations, to evaluate students' understanding and progress. Provide timely feedback to support their learning and improvement.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.46666 6666666 6668

Total SWL (h/sem) الحمل الدراسي للطلاب خلال الفصل	100
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Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Review
Week 2	Isometric drawing
Week 3	Isometric drawing
Week 4	Isometric drawing
Week 5	Quiz
Week 6	Dimensions
Week 7	Sectional Drawing
Week 8	Sectional Drawing
Week 9	Sectional Drawing
Week 10	Midterm exam
Week 11	Quiz
Week 12	Missing projection
Week 13	Missing projection
Week 14	Review
Week 15	Midterm exam
Week 16	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Engineering Drawing and Descriptive Geometry 2	4	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	4	63	37
Description			
يكتب وصف المادة هنا بين 100 الى 150 كلمة تقريبا			

Module Information					
معلومات المادة الدراسية					
Module Title	Mathematics 2		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	MEC009		☒ Theory Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar ☐		
Module Code					
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UGI	Semester of Delivery		Two
Administering Department		Mechanical	College	Engineering	
Module Leader	م عبد الامير طارق عباس		e-mail	atarik@uowasit.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		Msc
Module Tutor	Non		e-mail		
Peer Reviewer Name		م.د. علي فرج حمادي	e-mail	alifaraj@uowasit.edu.iq	
Scientific Committee Approval Date		25-6-2023	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Enabling students to understand and find integration for any mathematical functions. 2. Enabling students to deal with different linear equations and solve them by using different methods. 3. To know the benefit of integration applications with the rest of the engineering sciences. 4. To give students skills for solving problems in this field.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Realize the importance of studying mathematics and its relationship to engineering sciences. 2. Helping the student to find a solution to all mathematical integration problems using different mathematical methods. 3. Urging the student to understand mathematical problems, choose the ideal solution method for them, and create a moral motivation for the student to devise different ways to solve engineering problems.
Indicative Contents المحتويات الإرشادية	Indicative Contents the Followings Definite and Indefinite Integrals, Methods of Integrations, Matrices, Determinant, Solution of Linear Equation, Application of Integration and Complex Numbers.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	According to the prescribed curriculum using in-person education with the use of E-learning methods by giving lectures with a video presentation in Google Class room and interactive tutorials and some activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.79999 9999999 9998
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Indefinite Integration
Week 2	Indefinite integral and Methods of Integration
Week 3	Methods of Integration
Week 4	Methods of Integration
Week 5	Methods of Integration
Week 6	Methods of Integration
Week 7	Methods of Integration and Definite Integral
Week 8	Definite Integral and Matrices
Week 9	Matrices
Week 10	Determinants
Week 11	Determinants and Application of Integration
Week 12	Application of Integration
Week 13	Application of Integration and Introduction to Complex Numbers
Week 14	Mid-term Exam and Complex Number
Week 15	Complex Numbers and report
Week 16	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Mathematics 2	6	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	4	63	87
Description			
Qualifying, training and teaching the student on the rules and methods of integration of various functions and their mathematical applications in our daily lives and benefiting from them in the curriculum of advanced mathematics for the second stage and then in the third stage while solving different equations and linking them with the rest of the other topics. Calculus lectures in the second course are given in two parts, the first one in the classroom which involve 3 theoretical hours and 1 hour of discussion to clarify the topics in more detail each week which is defined SSWL (structural student work load) and the second part is defined as USSWL (unstructured student work load) which include all activity out the class.			

Module Information					
معلومات المادة الدراسية					
Module Title	Manufacturig Processes and Workshops 2		Module Delivery الرجاء الاستفادة من الجدول اخر صفحة		
Module Type	MEC007		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code					
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGI	Semester of Delivery		Two
Administering Department		Mechanical	College	Engineering	
Module Leader	ا.م.د. عمار داود غالي		e-mail	ammardawood@uowasit.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name		ا.م.د. عزام صباح حميد	e-mail	azzam@uowasit.edu.iq	
Scientific Committee Approval Date		15-2-2024	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1) Familiarizing students with the basics of various manufacturing processes, as a first step in preparing an efficient engineer who can produce various products in an optimal way. 2) Encouraging students to do scientific research to expand their engineering knowledge in modern manufacturing processes. 3) Studying the production of metallic and non-metallic materials 4) Study the properties, classification, and tests of engineering materials 5) Study and apply casting and welding processes 6) Study and apply forming and machining processes
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1) Understanding the importance of studying various manufacturing processes 2) Developing the skill of acquiring information, analysis of production processes 3) The student will be familiar with the basic concepts of the work of various machines (lathe, milling, and other machines in the workshops) 4) Training the student to apply the foundations and concepts he studied theoretically in work life 5) Introducing students about the factories environment and how to distribute machines in workshops and production lines. 6) The student is introduced to the periodic and emergency maintenance of the machines to avoid work risks.
Indicative Contents المحتويات الإرشادية	1) Knowing the importance of studying the various manufacturing processes in the practical and industrial aspects. 2) Knowledge of the role of design and developing in the quality and efficiency of the production process 3) Giving the student the confidence to participate in the production and manufacturing of product. 4) Providing the student with an applied skill for production machines 5) Knowing the main problems in the workshops and developing an optimal solution in the work environment 6) The student acquires some skills of managing productive workshops. 7) Provide the student with a spirit of caring for the machine and cooperating with colleagues to achieve the best results.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in this unit is to introducing the basic knowledge of the manufacturing processes, including interrelationships between the properties of the material, the manufacturing process and the design of components. Also, providing students with an overview of a wide variety of manufacturing processes. Thus, providing sufficient knowledge for the essential manufacturing processes as the first step to be an efficient engineer that can produce products in an optimal way. This can be achieved through classrooms and interactive educational programs in workshops and laboratories, and to raise intellectual questions through lectures and discussions by connect the topics of the lecture with the work environment in practical workshops. As well as encouraging students to

	participate in practical exercises in workshops and laboratories, while improving students' critical thinking skills and linking them with machines, tools, and manufactured parts in their daily lives.
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Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	32	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Sand Casting
Week 2	Die Casting
Week 3	Machining Operation
Week 4	Turning ,Milling ,Drilling ,Scraper ,Grinder
Week 5	Forming Processes
Week 6	Hot and Cold Forming
Week 7	Rolling ,Forging ,Drawing ,Extrusion
Week 8	Sheet Forming (Bending ,Deep drawing, Shearing
Week 9	Non-metallic Material (Production and properties)
Week 10	Plastics ,Composite material ,Class and Ceramics , Polymers
Week 11	Metals join / Screw , Rivet , Brazing and Soldering Join
Week 12	Metal Welding / Electric arc welding
Week 13	Gas welding + electric resistance welding
Week 14	Friction and forging welding
Week 15	Industrial Safety
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Milling workshop
Week 2	Lab 2: Milling workshop
Week 3	Lab 3: Forging workshop
Week 4	Lab 4: Forging workshop
Week 5	Lab 5: Grinding workshop
Week 6	Lab 6: Grinding workshop
Week 7	Lab 7: Computer workshop

Code	Course/Module Title	ECTS	Semester
	Manufacturing Processes and Workshops 2	5	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	6	93	32

Description

The subject of manufacturing processes and workshops are the basic subjects that directly related to daily used product. This course addressing the different types of manufacturing methods and production processes for various engineering materials and geometric shapes. Moreover, joining and welding or assembly methods of parts. Therefore, acquainting students with sufficient knowledge of basic manufacturing processes is considered as a first step to preparing an efficient engineer who can produce various products in an optimal way. The course includes the theoretical side of analyzing the types and importance of production methods, in addition to the practical side in the workshops, thus providing the student with the skill of analysis and practical application. It also encourages students to research and develop modern manufacturing processes.

Module Information						
معلومات المادة الدراسية						
Module Title	Electrical Engineering2		Module Delivery الرجاء الاستفادة من الجدول آخر صفح			
Module Type	B		☒ Theory Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar ☐			
Module Code	MEC008					
ECTS Credits	3					
SWL (hr/sem)	75					
Module Level		UGI	Semester of Delivery		Two	
Administering Department		Mechanical	College	Engineering		
Module Leader		م م رند جعفر		e-mail	rjudoou@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer		Module Leader's Qualification		Msc
Module Tutor				e-mail		
Peer Reviewer Name				e-mail		
Scientific Committee Approval Date		25-6-2023		Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Introducing the basic principle of alternating current 2. Study of alternating current and methods of connecting electric circuits in series, parallel , delta & star 3. Study of alternating current, resistance, Inductance , Capacitance and application of network theorems in A.C. 4. Study of real power, apparent power, three phase A.C calculations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. Summarize what is meant by a basic electric circuit. 3. Identify the basic circuit elements and their applications. 4. Discuss the operations of sinusoid and phasors in an electric circuit. 5. Discuss the various properties of resistors, capacitors, and inductors. 6. Explain the two Kirchoff's laws used in circuit analysis. 7. Identify the capacitor and inductor phasor relationship with respect to voltage and current. 8. The student learned about the methods of connecting electrical circuits and how to find current and voltage theoretically and practically.

Indicative Contents المحتويات الإرشادية	1. AC Fundamentals (Average and RMS values), Representation A.C 2. Response of basic R,L, &C elements 3. Capacitance and inductance & Phasor diagrams 4. definition of complex impedance 5. AC circuit analysis with complex numbers. 6. RL, RC and RLC circuits 7. Network theorems in A.C 8. Ac power 9. Three phase A.C calculations
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- Giving theoretical lectures directly in the classroom. 2- Laboratory lessons and many workshops to solve a specific problem. 3- Reports and studies. 4- Using clarification tools and uploading video lectures on the Google Classroom platform. 5- Direct discussion by asking questions and opening the door for dialogue and interaction with students
	6- Developing and enhancing the student's thinking skill and moving him to a higher level of thinking 7- Raising the spirit of cooperation and working within a team 8- Bringing out creative ideas among students by raising the spirit of competition Encouraging learners to ask a lot of questions is an effective teaching strategy that does not only motivate students to think more practically but also helps them to become independent learners.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

المناهج الاسبوعي النظري

	Material Covered
Week 1	Sinusoidal alternating waveforms, average value & rms value
Week 2	Response of basic R,L & C elements ,average power (quiz1)
Week 3	Power factor ,complex numbers
Week 4	Series A.C circuits(quiz2)
Week 5	parallel A.C circuits
Week 6	Series-parallel ac network
Week 7	Midexam1
Week 8	method of analysis(mesh & nodal) in AC (quiz 3)
Week 9	Network theorems in AC(super position, thevenin)
Week 10	Network theorems in AC(Norton & Max. power transfer)
Week 11	Apparent Power, Reactive power & Power triangle
Week 12	Apparent Power, Reactive power & Power triangle calculations
Week 13	Receiving report and discussion
Week 14	Polly phase system (three phase AC)
Week 15	Three phase AC calculations
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Super position theorem Experiment, A1
Week 2	Lab 2: Super position theorem Experiment, A2
Week 3	Lab 3: Receiving report5 A1 , discussion & Exam
Week 4	Lab 4: Receiving report5 A2 , discussion & Exam
Week 5	Lab 5: wheatstone bridge A1
Week 6	Lab 6: wheatstone bridge A2
Week 7	Lab 7: Receiving report 6 A1 , discussion & Exam
Week 8	Lab 8: Receiving report 6 A2 , discussion & Exam
Week 9	Lab 9: Voltage and current divider rule A1

Week 10	Lab 10: Voltage and current divider rule A2
Week 11	Lab 11: Thevenin Theorem A1, Receiving report 7 A1 & discussion
Week 12	Lab 12: Thevenin theorem A2. Receiving report 7 A2 & discussion
Week 13	Lab 13: Norton theorem A1, Receiving report 8 A1 & discussion
Week 14	Lab 14: Norton theorem A2, Receiving report 8 A2 & discussion
Week 15	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Electrical Engineering2	3	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	3	48	27

Description

AC Circuits

An alternating current (AC) is an electrical current that regularly reverses direction and changes its value constantly with time, contrary to DC current, which travels only in a single direction.

For many decades of electric power, the sinusoidal current and voltage have been used in power businesses and home.

During this course we will study the components of AC circuits (Resistor , Inductor & capacitor) and the Response of basic R,L & C elements, Average power, Power factor, also understanding the complex number and its applications.

As well as studying the network theorem in Ac circuits including superposition, thevenin, Norton & max. power transfer.

Three phase ac circuits will be discussed and introduction to magnetic circuits & Transformers

Alternating current circuits are continuously being utilized in home, offices and business outlets. This is due to the fact that producing and transferring AC across vast distances is quite simple. Electrical power transmission loses less energy at high voltages, such as above 110kV. Lower currents result from higher voltages, and lower currents result in less heat being created in the power line owing to resistance. Transformers make it simple to convert AC from high voltages.

Electric motors can also be powered by AC. The only difference between motors and generators is that motors transform electrical energy into mechanical energy. This is beneficial for many major appliances that run on AC, such as refrigerators, dishwashers, and so on.

AC circuits are used everywhere ranging from transportation to electricity production houses and all the electrical equipment used in a common household.

Module Information					
معلومات المادة الدراسية					
Module Title	Academic English 1		Module Delivery		
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	WUO2				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		UGI	Semester of Delivery		Two
Administering Department		Mechanical	College	Engineering	
Module Leader			e-mail		
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		PhD
Module Tutor	Ali Faraj Hammadi		e-mail	alifaraj@uowasit.edu.iq	
Peer Reviewer Name		• Hala A.Naman AL Tae • Ismail Sharhan Hburi • Ahmed Adel Naji	e-mail	• alaataeh@uowasit.edu.iq • isharhan@uowasit.edu.iq • ahmedadil@uowasit.edu.iq	
Scientific Committee Approval Date		9-11-2023	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This module provides all the language and skills students need to improve their English, with grammar, vocabulary, and skills work in every unit. The aim is represented by the module's trusted methodology combines solid grammar and practice, vocabulary development, and integrated skills.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Demonstrate understanding of academic texts and summarize them orally and in writing. 2- Demonstrate an ability to write with a fair degree of accuracy in a variety of genres. 3- cope effectively with everyday situations everywhere in English 4- Demonstrate learner independence and be aware of their own linguistic strengths and weaknesses. 5- Participate in discussions/seminars on a variety of subject related, academic and general topics.
Indicative Contents المحتويات الإرشادية	12.5 hrs : Reading Skills 12.5 hrs : Writing Skills 12.5 hrs : Listening Skills 12.5 hrs : Speaking Skills

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Reading a range of pre-intermediate level articles on selected general topics. Writing a topic (informal emails, e.g.,) to classmates to discuss group work. Writing and submitting an assignment to a lecturer, Writing slides for presentations. Listening to authentic material at the beginner level to develop listening skills and comprehension. For Speaking, students may self-select and discuss topics with classmates on a group project. Typical topics that could be used at this level in the teaching of vocabulary include The World Around Us (Countries, Nationality, Language, Physical world, Weather, etc.). It may be appropriate for students to select grammar points for discussion in class, or for the lecturer to select them as they arise in students' writing. Grammar points that typically arise at this level include present simple and past simple; present continuous; question forms and auxiliary verbs; comparison; word order; prepositions; basic phrasal verbs.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Unit.1 Hello!
Week 2	Unit.2 Your world
Week 3	Unit.3 All about you
Week 4	Unit.4 Family and friends
Week 5	Unit.5 The way I live
Week 6	Unit.6 Every day+ Quiz
Week 7	Unit.7 My favorites
Week 8	Unit.8 Where I live
Week 9	Unit.9 Times past
Week 10	Unit.10 We had a great time!+ Quiz
Week 11	Unit.11 I can do that!
Week 12	Unit.12 Please and thank you +Midterm exam
Week 13	Unit.13 Here and now
Week 14	Unit.14 It's time to go!
Week 15	Presentation (seminars)
Week 16	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Academic English 1	2	Two
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	2	33	17

Description

The purpose of this module is to develop students' linguistic ability by focusing on the key skills of reading, writing, speaking and listening, to encourage students to become independent learners and to introduce them to strategies and skills to enable them to cope with the demands, both academic and cultural, of undergraduate study in an English-speaking environment.

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Mechanics (Dynamics)		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	C		☒ X Theory Lecture ☐ Lab ☐ X Tutorial ☐ Practical ☐ Seminar ☐		
Module Code	MEC0019				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII	Semester of Delivery		Four
Administering Department		Mechanical	College	Engineering	
Module Leader	ام د انور جمعة احمد		e-mail	aalobaidi@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Prof.	Module Leader's Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number	1.0	

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 an understanding of body motion. 2. To understand the kinematics and kinetics of particles and rigid bodies. 3. To understand Newton's Laws. 4. To understand the relative motion of particles and rigid bodies. 5. This course studies particles' impact, impulse, and momentum.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the Rectilinear Kinematics Motion 2. Describe (Continuous Motion) 3. Describe (Curvilinear Motion) 4. Discuss the Projectile Motion 5. Describe Absolute dependent motion 6. Understand the Relative Motion 7. Discuss the Kinetics of a Particle and the equation of motion (EoM) 8. EoM of Rectangular coordinates 9. Describe the various coordinates of motion: Normal and Tangential coordinates 10. EoM: Cylindrical coordinates

Indicative Contents المحتويات الإرشادية	- Dynamics is divided into kinematics and kinetics. Kinematics describes the motion of objects, while kinetics studies forces that cause motion changes. - The first part, the kinematics, will cover particles through the first (6 weeks), including the linear and non-linear motion. - The second part, the Kinetics, will discuss and explain from the 7th week until week 10, including the work and energy principles, power and efficiency, impulse and momentum. Additionally, the last 5 weeks will study the Planar Kinematics of a rigid body: Rotation + Absolute Motion. Then understanding the Relative Motion Analysis: Velocity, Instantaneous Center of Zero Velocity, acceleration and rotating axis
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in the exercises, while at the same time improving and expanding their critical thinking skills. This will be achieved through classes and interactive tutorials.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.4667
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to the Dynamics
Week 2	Rectilinear Kinematics: Continuous Motion
Week 3	Curvilinear motion: Rectangular components
Week 4	Projectile Motion
Week 5	Curvilinear motion: normal and tangential components

Week 6	Curvilinear motion: Cylindrical components
Week 7	Curvilinear motion: Cylindrical components
Week 8	Absolute dependent motion

Week 9	Relative Motion- Translating Axis
Week 10	Kinetics of a Particle
Week 11	The equation of motion (EoM)
Week 12	EoM: Rectangular coordinates
Week 13	EoM: Normal and Tangential coordinates
Week 14	EoM: Cylindrical coordinates
Week 15	Report Discussion
Week 16	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Engineering Mechanics (Dynamics)	4	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	1	48	52

Description

Dynamics is the study of how moving objects behave. Dynamics is the part of mechanics that studies movement and its causes. Therefore, this course deals with the causes of motion and changes in motion, Besides, the results of this motion, such as the Impact between bodies. Dynamics is distinguished from kinematics, which describes motion, without regard to its causes, in terms of position, velocity, and acceleration, and kinetics, which is concerned with the effect of forces and torques on the motion of bodies having mass. As a rule, the motions of bodies obey Newton's laws of motion. Newton's second law is one of the most important in all of physics.

Module Information					
معلومات المادة الدراسية					
Module Title	Mathematics 3		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	C		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC0011				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII	Semester of Delivery		Three
Administering Department		Mechanical	College	Engineering	
Module Leader		م د حيدر كريم مصراع		e-mail	haiderkareem@uowasit.edu.iq
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		PhD
Module Tutor				e-mail	
Peer Reviewer Name				e-mail	
Scientific Committee Approval Date		17-9-2024	Version Number		1.0

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 processes undertaken to arrive at a suitable mathematical model. 2- To teach the fundamental analytical techniques and computational methods used to develop insight into system behaviour. 3- Apply mathematical methodologies to a range (industrial, biological and environmental) of problems, associated conceptual models and their solutions. 4- Recognize connections between theory and applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1) Solving and computing real-world applications of finite and discrete mathematics. 2) Setup and solve linear systems geometrically and algebraically. 3) Solve problems in a range of mathematical applications using derivatives. 4) Represent vectors analytically and geometrically, and compute dot and cross products for presentations of lines and planes. 5) Distinguish between the concept of sequence and series and determine limits of sequence. 6) Define, differentiate and integrate functions represented as power series expansions, including Taylor series.

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 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 (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.0
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Mechanical Drawing
Week 2	Vectors
Week 3	Vectors and the Geometry of Space Lines and Planes in Space The Distance from a Point to a Plane
Week 4	Vector Valued Functions and Motion in Space Derivatives and Motion
Week 5	The particles velocity and acceleration vector Cartesian, Cylindrical and spherical coordinates
Week 6	The particles velocity and acceleration vector Cartesian, Cylindrical and spherical coordinates
Week 7	Chain Rule
Week 8	partial derivatives Functions of More Than Two Variables Second Order Partial Derivatives
Week 9	Integral's theorems

Week 10	Relation between Cartesian, cylindrical and spherical coordinates
Week 11	First order ordinary differential equation (separable, linear, homogenous & Exact)
Week 12	Second order differential equation (homogenous & non homogenous)
Week 13	D operator method for Solving Nonhomogeneous Linear Differential Equations.
Week 14	Series (sequence, converge and divergence of sequence, Infinite series, converge and divergence tests for series, power series, power series and converge)
Week 15	Double Integral & Triple integral
Week 16	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Mathematics 3	4	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
3	1	63	37
Description			

Module Information			
معلومات المادة الدراسية			
Module Title	English 2		Module Delivery
Module Type	B		☐ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	WU23		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UGII	Semester of Delivery	
Administering Department	Mechanical	College	Engineering
Module Leader	Karrar Kadhim Khlaif	e-mail	Karrar.kadhim@uowasit.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor	Karrar Kadhim Khlaif	e-mail	Karrar.kadhim@uowasit.edu.iq
Peer Reviewer Name	ام د محمد حسين راضي	e-mail	mradhi@uowasit.edu.iq
Scientific Committee Approval Date	30/1/2025	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The primary goal of an English class is to enhance students' proficiency in reading, writing, speaking, and listening in this class. This involves expanding vocabulary, mastering grammar, and developing effective communication skills that are essential for academic and professional success. Additionally, the class aims to foster critical thinking and analytical skills through the exploration of diverse literature and texts, encouraging students to engage with different cultural perspectives. Ultimately, an English class seeks to create a supportive environment where students can express themselves creatively, build confidence in their language abilities, and prepare for future opportunities.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understanding and Demonstrating English Tenses: Students will efficiently grasp and use various English tenses in both spoken and written communication. 2- Essay Writing: Students will develop the ability to write coherent and structured essays, effectively presenting their ideas and arguments. 3- Improvement in Using Conjunctions: Students will enhance their understanding and application of conjunctions to create more complex and fluid sentences. 4- Effective Email Writing: Students will learn to compose professional and clear emails that convey their messages appropriately and effectively. 5- Reading Comprehension: Students will improve their ability to read and comprehend paragraphs, identifying key ideas and details to enhance their understanding of texts. By achieving these outcomes, students will strengthen their overall English language proficiency and communication skills.

Indicative Contents المحتويات الإرشادية	20 hrs : Reading Skills 10 hrs : Writing Skills 10 hrs : Listening Skills 10 hrs : Speaking Skills
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Reading: Engage with pre-intermediate articles on general topics to improve reading comprehension and vocabulary. Writing: Practice writing informal emails to classmates about group work, submitting assignments to lecturers, and creating presentation slides to enhance clarity in communication. Listening: Develop listening skills by working with authentic beginner-level audio materials, helping students adapt to various accents and contexts. Speaking: Discuss self-selected topics related to group projects with classmates, promoting collaboration and practical application of language skills. Vocabulary: Focus on thematic units such as "The World Around Us," covering countries, nationalities, languages, and weather to contextualize vocabulary learning.
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	Grammar: Address essential grammar points, including present simple, past simple, present continuous, question forms, and more, allowing students to choose topics for discussion based on their writing needs
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review
Week 2	Present Tenses (Simple, Continuous, Perfect)
Week 3	Past Tenses (Simple, Continuous, Perfect)
Week 4	Tenses (Simple, Continuous, Perfect) + Mixed Tenses Practice (Review & Usage in Conversations)
Week 5	Tenses + Articles (A, An, The) and Conjunctions (Connecting Words)
Week 6	Question Words (Who, What, Where, When, How, etc.)
Week 7	Passive Voice vs. Active Voice
Week 8	Modal Verbs (Can, Should, Must)
Week 9	Midterm Exam
Week 10	General Requirements of Writing
Week 11	Writing Essay
Week 12	Writing Official Emails
Week 13	Reading (summarizing the articles)
Week 14	Personal Writing
Week 15	Writing introductions in academic papers

Code	Course/Module Title	ECTS	Semester
WU23	English 2	2	Four
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	2	33	17
Description			
The primary goal of an English class is to enhance students' proficiency in reading, writing, speaking, and listening in this class. This involves expanding vocabulary, mastering grammar, and developing effective communication skills that are essential for academic and professional success. Also, will encourage students to become independent learners.			

Module Information			
معلومات المادة الدراسية			
Module Title	Strength of Materials 1		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MEC0016		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGII	Semester of Delivery	Three
Administering Department	Mechanical	College	Engineering
Module Leader	ا.م.د. حسين رزاق صباح	e-mail	hrzzaq@uowasit.edu.iq
Module Leader's Acad. Title	Assistant Prof.	Module Leader's Qualification	PhD
Module Tutor		e-mail	
Peer Reviewer Name	Dr.Radwan M. Adday	e-mail	aalobaidi@uowasit.edu.iq
Scientific Committee Approval Date	25-6-2023	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aims of this module are to: 1. Teach students the concepts of stress and strain and the relations between them. 2. Teach them the calculation of stress in different application such as in shaft, thin-walled cylinders and spheres under pressure; and springs. 3. Teach the students the deformation analysis in statically determinate and indeterminate axially loaded systems 4. Teach the students the calculation of stresses induced from temperature changes (i.e. thermal stresses) 5. Teach the students the concepts of column buckling. 6. Teach the students the concept of stress transformation and the use of Mohr's Circle.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. A good understanding of stress and strain and their relation to loads and deformations, respectively. 2. Adequate ability to perform stress and strain analyses in slender structural elements under various types of external loading and in thin-walled cylinders and spheres under pressure. 3. Sufficient ability to perform deformation analysis for simple statically determinate and indeterminate problems. 4. A good understanding for the effect of temperature difference on generation of thermal stresses. In addition, a student should be familiar of calculation the axial deformation under the effect of thermal stresses. 5. A sufficient understanding for the stresses that can be developed due to the application of a torque in circular section. 6. A good understanding for the buckling of column. 7. Ability to transform stresses and strains between different coordinate systems and application of Mohr's Circle to determine the maximum normal and shear stresses. 8. Adequate knowledge to connect between the theoretical information given in the class and their application in the reality.
Indicative Contents المحتويات الإرشادية	Direct Stresses : Simple normal stresses, simple shear stress and bearing stress [6 hrs] Thermal Stresses: coefficient of expansion, varying temperature to secure zero stress, computation of thermal stresses [6 hrs]. Applications (springs, thin walled cylinders): Types of springs, helical spring notations, calculation of torsional stress and elongation, heavy and light spring formula. [12 hr] Torsion: assumptions for the torsion formula, mathematical formulas for the torsional shear and angle of twist of circular section, polar moment of inertia [6 hrs] Deformation: axial, biaxial and tri-axial deformation, Poisson's ratio [9 hrs]. Statically indeterminate problems: Introduction, solving the problem that can not be

	solved using Newton's laws only [6 hrs]. Beam Buckling: Definition and mathematical formulation [6 hrs] Stress Transformation: Stresses at an inclined sections, stress at an element, Mohr's circle, principal stresses, maximum and minimum shear stress [9 hr].
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module contains: 1- Explaining the outline of the class lecture in the beginning and relating (if possible) the present lecture with the previous one. 2- Encouraging the students' participation in the exercises. At the same time, the strategy will adopt expanding the student thinking through short questions. 3- For further understanding the module, the students will be asked for a presentation on the industrial applications where strength of materials is important.
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Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction, definition of stress, stresses types, systems of units
Week 2	Shear stress and bearing stress
Week 3	Axial deformation
Week 4	Quiz 1 , Biaxial, and triaxle deformation
Week 5	Thermal stresses
Week 6	Mid-term exam1
Week 7	Stresses in thin-walled pressure vessels, Assignment 1
Week 8	Stresses in Helical springs, presentation part 1
Week 9	Quiz 2 , Stresses in Helical springs
Week 10	Torsion
Week 11	Buckling of column
Week 12	Mohr's Circle,
Week 13	Mid-term exam2, Presentation part 2
Week 14	Quiz 3 , Mohr's Circle,
Week 15	Assignment 2
Week 16	Preparatory week before the final Exam

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.46666 6666666 6668
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1,2,3	Lab 1: Tensile Test
Week 4,5,6	Lab 2: Brinell hardness test
Week 7,8,9	Lab 3: : Torsion test
Week 10,11,12	Lab 4: Torsion test
Week 13, 14, 15	Lab 5: Creep test

Code	Course/Module Title	ECTS	Semester
	Strength of Materials 1	4	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	4	63	37
Description			
The strength of materials 1 module is considered important as it is an extended version of the mechanical engineering and then it will be useful and important when the student is studying the machine design. This module contains the information about stresses in the materials under various external loads. In addition, it covers the investigation of the deformation that is related to those external loads. In addition, these concepts of stresses and deformation will be illustrated through different applications such as in thin-walled pressure vessels, springs, and circular shafts. Moreover, additional concepts on column buckling, stresses at an inclined sections and at transformed coordinates will also be covered.			

Module Information						
معلومات المادة الدراسية						
Module Title	Mechanical Drawing		Module Delivery			
Module Type	C		X Theory ☐ Lecture ☐ Lab X Tutorial ☐ Practical ☐ Seminar			
Module Code	MEC0022					
ECTS Credits	5					
SWL (hr/sem)	125					
Module Level		UGI	Semester of Delivery		Four	
Administering Department		Mechanical	College	Engineering		
Module Leader		Asst.Prof.Dr. Hatam M. Samaka		e-mail	hsamaka@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Professor		Module Leader's Qualification		PhD
Module Tutor		Dr. Waseem Alwan Zaboon		e-mail	Waseem.Alwan@uowasit.edu.iq	
Peer Reviewer Name		Assis.Prof. Hussein Dalfi		e-mail	hqumar@uowasit.edu.iq	
Scientific Committee Approval Date		27 /1/2025		Version Number		1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Teaching the student the basics of mechanical drawing rules 2. Training the student on how to draw mechanical parts used in machines and devices 3. Training the student on how to assemble mechanical parts to form a machine or mechanical system
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Find a student who has the ability to draw, assemble and disassemble mechanical parts. 2. Ability to read mechanical drawing symbols and know their meanings and where to use them 3. Developing the ability to imagine the projections and sections of mechanical bodies 4. Developing students' abilities regarding the assembly and disassembly of mechanical parts 5. Preparing technical reports and skills to communicate with others and instilling the work spirit through working as a team
Indicative Contents المحتويات الإرشادية	mechanical drawing

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

1. Encourage students to read sources on mechanical drawing.
2. Encouraging students to learn drawing skills using international educational videos
3. Follow up on students in the classroom (study room) to detect and correct errors.
4. Conducting quick and thoughtful tests to know the level reached by students and try to improve
5. Preparing class and homework assignments to strengthen students' skills

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Classification of screws
Week 2	Hexagon screws
Week 3	Joining by bolts or screws
Week 4	Classification of Keys
Week 5	Classification of pins and rivets
Week 6	Surface finishing
Week 7	Tolerances
Week 8	Fits, Classification of fit, clearance, Transition
Week 9	Fits, Interference, calculation of fits and tolerance
Week 10	Welding
Week 11	Welding
Week 12	Gears , Spur Gear
Week 13	Gears , Spur Gear
Week 14	Assembly Drawing
Week 15	Assembly Drawing

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Code	Course/Module Title	ECTS	Semester
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
Description			
The purpose of this module is to develop students' linguistic ability by focusing on the key skills of reading, writing, speaking and listening, to encourage students to become independent learners and to introduce them to strategies and skills to enable them to cope with the demands, both academic and cultural, of undergraduate study in an English-speaking environment.			

Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Metallurgy		Module Delivery الرجاء الاستفادة من الجدول اخر صفحة		
Module Type	C		☐ Theory Lecture ☐ √ Lab ☐ Tutorial ☐ Practical ☐ Seminar ☐		
Module Code	MEC0013				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		UGII	Semester of Delivery		Three
Administering Department		Mechanical	College	Engineering	
Module Leader		م د رغدان محسن ناموس		e-mail	raghdan@uowasit.edu.iq
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		PhD
Module Tutor				e-mail	
Peer Reviewer Name				e-mail	
Scientific Committee Approval Date		25-6-2023	Version Number		1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Understand the structure of metallic material down from the smallest known entities (the atoms) and going up into the crystallographic structure. 2. Define the defects in the crystallographic structure and their influence on the metallic material properties. 3. Define the structure-properties dependance in metallic materials. 4. Introduce the alloying and phase diagrams concepts. 5. Special focus on Iron-Carbon phase diagram the one of the most important metallic system. 6. Heat treatment of metallic material and properties adjustment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize the unique structure of metallic materials which makes it the cornerstone of the modern civilization. 2. Understand the structure-properties dependance of the metallic materials. 3. Understand how to adjust the properties by controlling the defects in the metallic material structure. 4. Understand the structure of metals and alloys. 5. Understand how to adjust the properties by heat treatment and phase changing. 6. Understand the principle of material selection and how to match the applications' needs to the materials' properties via critical thinking.

Indicative Contents

المحتويات الإرشادية

- **Atomic structure and interatomic bonding.**
 - Atomic structure.
 - Periodic table.
 - Bonding forces and energies.
 - Primary and secondary intermetallic bonds.
- **Crystallographic structure in solids.**
 - Unit cell.
 - Crystal structure.
 - Polymorphism and allotropy.
 - Crystallographic directions and plans.
 - Close packed crystal structures.
 - Polycrystallinity and anisotropy.
- **Imperfections and defects in metallic material.**
 - Point defects; vacancies and impurities.
 - Linear defects; dislocations.
 - Interfacial defects; grain boundary, surfaces, twin boundary.
 - Other defects.
 - Microscopic examination:
 - Optical microscopy.
[Laboratory experiment 1; Grinding and polishing]
[Laboratory experiment 2; Etching and microstructure examination].
 - Grain size determination.
[Laboratory experiment 3; Grain size determination].
- **Deformation in metallic material.**
 - Deformation by dislocation slip.
 - Deformation by twins.
[Laboratory experiment 4; Hardness testing].

	● Phases and phase diagrams. ● Phases. ● Unary phase diagram. ● Binary phase diagram. ▪ Phase composition determination. ▪ Phase amount determination. ▪ Solidification in equilibrium and non-equilibrium cooling. ▪ Eutectic systems. ▪ Solidification in equilibrium and non-equilibrium cooling in eutectic systems. ● Phase transformation in Iron-Carbon system and T-T-T and C.C.T diagrams. ● Mechanical properties of metallic material. ● Phase transformation-mechanical properties dependence (heat treatment). ● Case study; Heat treatment of carbon steel. [Laboratory experiment 5; Perform the heat treatments] [Laboratory experiment 6; Microstructure of steel after different heat treatment] [Laboratory experiment 7; Mechanical properties for different steel phases]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Our teaching strategy based on involving a combination of learner-centered approaches, active learning techniques, and the integration of technology to create an engaging educational environment. The strategy emphasizes the importance of understanding students' individual needs, and interests to allow for personalized instructions in the learning process. The strategy encourages collaborative and interactive activities, such as group discussions, case studies, problem-solving exercises, and hands-on experiments, to stimulate critical thinking, creativity, and practical application of knowledge. Additionally, the employment of digital tools and resources enhances accessibility, and encourages independent learning, which in turn enables students to develop a deep understanding of the subject matter and acquire valuable skills for the future.

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	82	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.46666 6666666 6668
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	175		

Delivery Plan (Weekly Syllabus)	
المناهج الاسبوعي النظري	
	Material Covered
Week 1	Atomic structure
Week 2	Atomic bonding
Week 3	Crystallographic structure in solids
Week 4	Crystallographic structure in solids II (Unit cell parameters, Polycrystallinity, isotropy and anisotropy)
Week 5	Imperfection in solids I (Point and linear defects)
Week 6	Imperfection in solids II (Dislocation motion)
Week 7	Interfacial defects
Week 8	Mechanical properties of metals and alloys
Week 9	Phase diagrams I (Introduction, Unary and Binary systems, and isomorphous systems)
Week 10	Phase diagrams II (Non-equilibrium cooling and eutectic diagrams)
Week 11	Phase diagrams III (Microstructure development and phase diagrams calculations)
Week 12	The Iron–Carbon System
Week 13	Iron-Carbon alloys Microstructure and properties changes
Week 14	Continuous cooling transformation diagrams CCT
Week 15	Heat treatment of steel
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Grinding and polishing
Week 2	Lab 2: Etching and microstructure revealing
Week 3	Lab 3: Grain size determination
Week 4	Lab 4: Hardness testing
Week 5	Lab 5: Perform the heat treatments
Week 6	Lab 6: Microstructure of steel after different heat treatment
Week 7	Lab 7: Mechanical properties for different steel phases

Code	Course/Module Title	ECTS	Semester
	Engineering Metallurgy	7	Three
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
4	6	93	55

Description

Engineering metallurgy is a field that focuses on the study of metals and alloys and their applications in various engineering disciplines. It encompasses the understanding of the physical, chemical, and mechanical properties of metals, as well as their behavior under different conditions. Additionally, engineering metallurgy analyzes the structure and composition of metals and alloys to optimize their performance and durability. It employs techniques like heat treatment, alloying, and surface modification to enhance the properties of metals for specific applications. Engineering metallurgy plays a vital role in industries such as aerospace, automotive, construction, and manufacturing, enabling the development of innovative and efficient materials that meet the ever-evolving demands of modern engineering.

Module Information					
معلومات المادة الدراسية					
Module Title	Heat Transfer I		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC3308				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII	Semester of Delivery		Five
Administering Department		Mechanical	College	Engineering	
Module Leader	أ.د. زينة خليفة كاظم		e-mail	drzena@uowasit.edu.iq	
Module Leader's Acad. Title		Prof. Dr.	Module Leader's Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name		Dr.Radwan M. Adday	e-mail	aalobaidi@uowasit.edu.iq	
Scientific Committee Approval Date		30-3-2026	Version Number	1.0	

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 heat transfer through the application of techniques. 2.To understand the principle of heat transfer 3.This course deals with the basic concept of conduction and radiation heat transfer. 4.This is the basic subject for all conduction and radiation heat transfer 5.To understand the conduction heat transfer laws includes the one-dimensional steady state (cartesian, cylindrical, and spherical coordinates), the two-dimensional steady state (numerical solution), and the unsteady state (lumped analysis). 6.To understand the laws of radiation heat transfer, including properties, emissivity, shape factor, and heat exchange between non-black bodies
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize the conduction heat transfer parameters. 2. Derive thermal conduction resistance for cartesian, cylindrical, and spherical geometries, and they represented with Ohm's law 3. Recognize the use of numerical analysis techniques for solving two-dimensional heat conduction problems. 4. Describe thermal resistance and overall heat transfer coefficient.

	5. Discuss the unsteady state conduction heat transfer 6. Discuss important points in the conduction heat transfer part. 7. Identify the principle of radiation heat transfer. 8. Define Kirchhoff's identity, shape factors 9. Heat Exchange between non-black bodies. 10. Representing black and non-black bodies' heat exchange by electric circuits
Indicative Contents المحتويات الإرشادية	Introduction: Conduction heat transfer, thermal conductivity, convection heat transfer, radiation heat transfer [6hr]. Steady state heat conduction-one dimension. Conduction through the walls, plane walls, radial cylinder systems, overall conduction -convections systems, Heat transfer through extended surfaces (Fins),[12hr]. Steady state heat Conduction-Multi-dimensions. Mathematical analysis of 2-D heat transfer, numerical analysis in one dimension[9hr]. Unsteady- state heat conduction. Lumped-heat-capacity system, transient numerical method, multidimensional systems, solve problems [9hr]. Radiation heat transfer. Physical mechanism, radiation properties, radiation shape factors, heat exchange between black bodies, infinite parallel planes, radiation shields, radiation network for an absorbing and transmitting medium, radiation exchange with transmitting reflecting and absorbing media [9hr].

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module contains: 1. Explaining the outline of the class lecture in the beginning and relating (if possible) the present lecture with the previous one. 2. Involving students in interactive tutorials and groups solving of problems. 3. Encouraging the students' participation in the exercises. At the same time, the strategy will adopt expanding the student thinking through short questions. 4. For further understanding the module, the students will be asked for a number of assignments that can reflect their understanding for the materials in the module.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.46666 6666666 6668
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	An introduction to the basic principles heat transfer, Conduction, Convection and Radiation heat transfer.
Week 2+3	Steady state heat conduction-one dimension. Conduction through the walls, plane walls, radial cylinder systems.
Week 4+6	overall conduction -convections systems, Heat transfer through extended surfaces (Fins).
Week 6	Qize1.
Week 7+8	Steady state heat Conduction-Multi-dimensions. Mathematical analysis of 2-D heat transfer, numerical analysis in on dimension.
Week 9	Qize2.
Week 10	Unsteady- state heat conduction. Lumped-heat-capacity system, transient numerical method, multidimensional systems, solve problems.
Week 11	Midterm.
Week 12+13	Radiation heat transfer. Physical mechanism, radiation properties, radiation shape factors, heat exchange between black bodies, infinite parallel planes, radiation shields, radiation network for an absorbing and transmitting medium, radiation exchange with transmitting reflecting and absorbing media
Week 14	Continuing the discussion of the report and presenting the project.
Week 15	Solving the Problem and exam preparation.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2,3	Lab 1: Electrical measurement of thermal conductivity of metals.
Week 4,5,6	Lab 2: Mechanical measurement of thermal conductivity.
Week 7,8,9	Lab 3: Measurement of contact resistance between metals
Week 10,11,12	Lab 4: Measurement of temperature distribution on a flat plate.
Week 13,14,15	Lab 5: Measurement of the Steven-Boltzmann radiation coefficient.

Module Information

معلومات المادة الدراسية

Module Title	Heat Transfer II		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC3309				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII	Semester of Delivery		Five
Administering Department		Mechanical	College	Engineering	
Module Leader	أ.د.زينة خليفة كاظم		e-mail	drzena@uowasit.edu.iq	
Module Leader’s Acad. Title		Prof. Dr.	Module Leader’s Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name		Dr.Radwan M. Adday	e-mail	aalobaidi@uowasit.edu.iq	
Scientific Committee Approval Date		30-3-2026	Version Number		1.0

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	The aims of this module are to: 1. Understand convective heat transfer, viscous/inviscid flow, and boundary layer theory (thermal and velocity) for both flat plates and inside pipes. 2. Forced and Natural Convection: Analyze and calculate heat transfer rates for
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	both forced (external/internal) and natural (free) convection scenarios, including the use of dimensionless numbers (Nusselt, Reynolds, Grashof). 3.Heat Exchanger Design: Identify, classify, and analyze different types of heat exchangers (e.g., shell-and-tube, plate), calculating performance metrics like the Overall Heat Transfer Coefficient. 4.Performance Analysis: Apply Log Mean Temperature Difference (LMTD) and Effectiveness-NTU methods to evaluate and design efficient heat exchange systems. 5.Application & Practical Skills: Develop skills to solve real-world engineering problems related to cooling, heating, and power generation, including finned surfaces and heat sinks. 6.The course aims to integrate theoretical knowledge with practical skills needed to design, analyze, and optimize heat transfer equipment.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define and explain the physical mechanisms of convective heat transfer, including the role of boundary layers (hydrodynamic and thermal). 2. Apply empirical correlations and formulas to calculate convective heat transfer coefficients and rates for both forced and natural (free) convection. 3. Predict temperature distributions and heat transfer rates for various flow regimes (laminar/turbulent) and geometries (external/internal flow). 4. Identify and apply dimensionless numbers (Nusselt, Reynolds, Prandtl, Grashof, to determine heat transfer behavior. 5.Design and analyze heat exchanger performance using methodologies like Log Mean Temperature Difference (LMTD) and Effectiveness-NTU method. 6. Understand the principles of convection involving phase changes, such as boiling and condensation.
Indicative Contents المحتويات الإرشادية	1.Principles of convection. Laminar, boundary layer on a flat-plate, energy equation of the boundary layer, thermal boundary layer, the relation between fluid friction and heat transfer. [3hr]. 2. Forces convection systems. Forced convection over walls, cylinders, boundary layers, forced convection inside pipes, rectangular cross sections. [9hr]. 3. Natural convection systems. Natural convection on vertical, horizontal and inclined cylinders, free convection from spheres, enclosed spaces, combined free and forced convection. [9hr]. 4. Heat exchangers. Type of heat exchangers, overall heat transfer coefficient, fouling factors, LMTD method, ϵ-NTU method, heat exchanger design. [12hr]. 5. Boiling and condensation. Condensation phenomena, condensation numbers, film condensation, boiling, simplified relations for boiling, design information. [12].

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The primary strategy for delivering this module is to encourage students' participation in solving the exercises while at the same time developing their critical thinking skills. This will be accomplished through classes, interactive tutorials, and simple experiments involving enjoyable sampling activities for students. throughout the following: 1.Utilize appropriate empirical relations to solve engineering problems. 2.Select appropriate methods for calculating convective rates in industrial applications. 3. Analyze heat transfer data from practical laboratory experiments
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.46666 6666666 6668
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Principles of convection. Laminar, boundary layer on a flat-plate, energy equation of the boundary layer, thermal boundary layer,
Week 2	The relation between fluid friction and heat transfer.
Week 3+4+5	Forces convection systems. Forced convection over walls, cylinders, boundary layers, forced convection inside pipes, rectangular cross sections.
Week 6	Flow over the tube bank.
Week 7	Qize1.
Week 8+9	Natural convection systems.

	Natural convection on vertical, horizontal and inclined cylinders, free convection from spheres, enclosed spaces, combined free and forced convection.
Week10	Midterm.
Week 11,12	Heat exchangers. Type of heat exchangers, overall heat transfer coefficient, fouling factors, LMTD method, ϵ -NTU method, heat exchanger design.
Week 11	Qize
Week 12+13	Boiling and condensation. Condensation phenomena, condensation numbers, film condensation, boiling, simplified relations for boiling, design information.
Week 14	Continuing the discussion of the report and presenting the project.
Week 15	Solving the Problem and exam preparation.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2,3	Lab 1: Heat transfer by force convection.
Week 4,5,6	Lab 2: Heat transfer by Free convection.
Week 7,8,9	Lab 3: Air flow over tube bank.
Week 10,11,12	Lab 4: Parallel flow heat exchanger test.
Week 13,14,15	Lab 5: Counter flow heat exchanger test.

Module Information					
معلومات المادة الدراسية					
Module Title	Theory of machine 1		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	C		X Theory X Lecture X Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC3304				
ECTS Credits	8				
SWL (hr/sem)	200				
Module Level		UGIII	Semester of Delivery		Six
Administering Department		Mechanical	College	Engineering	
Module Leader	ام د حاتم محمود سماكة		e-mail	hsamaka@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Prof.	Module Leader's Qualification		PhD
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		25-6-2023	Version Number	1.0	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	17. Develop students' knowledge about the movement of mechanical parts within mechanical systems 18. Developing students' skills in the field of balancing rotating mechanical parts in mechanical systems 19. Study the effect of gyroscopic moments on aircraft, missiles, ships and submarines 20. Studying the types of centrifugal speed control (Governor) devices by controlling the amount of fuel entering 21. Studying the types of gears and pulleys used in the transmission of rotational motion in mechanical systems 22. Studying how friction can be used to transmit motion in mechanical systems (Clutch and Belt drive) 23. To learn about the function of the Flywheels in engines and how to store and convert energy while the engine is running

	24. Study the types of cams, their function and where they are used
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	24. The student learns how to calculate the speed and acceleration of any moving part in mechanical systems 25. The student learns how to balance rotating masses in mechanical systems using an additional mass 26. How to calculate the gyroscopic torque generated in means of transport such as aircraft, naval ships, submarines, as well as missiles, and what are the processors to control this harmful torque generated 27. Acquisition of the skill in how to calculate the rotational speed of different types of gears in mechanical systems that use gears to transmit movement and torques 28. Knowing how to convert the kinetic energy in the mechanical drive in the flywheel into energy stored in it and then recover it when needed 29. Studying the types of mechanical clutches in motors, how they work, and calculating moments and forces in its parts 30. Study the types of conveyor belts and how to transmit movement in them using types of pulleys 31. Acquiring the skill in how to calculate the speed and torque generated in the speed control (Governor) devices in the motors, in addition to learning the method of calculating the masses necessary to perform the required function 32. Acquisition of the skill in how to draw the shape of the cam and the guide and the amount of speed of the guide with the rotation of the cam
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A Clutch - definition, Its function, types, uses, torque generated in it, distribution of forces among its parts [6 hrs] Belt Drive – definition, Its function, types, uses, torque generated in it, distribution of forces among its parts, adoption of the principle of friction in its work [6 hrs] Revision problem classes (Clutch and Belt drive) [3 hrs] Governor - definition, Its function, types, uses, speed, torque generated in it, how lifting the sleeve, stiffness of the spring, governor sensitive [6 hrs] Revision problem classes [2 hrs] Crank-Effort Diagram – Flywheel definition, Energy storage, energy return to the motor, the relationship between rotational speed and energy storage [3 hrs] Balancing - Definition of the process of equilibrium in rotating bodies, how is the process of equilibrium using the additional mass [6 hrs] Revision problem classes [2 hrs] Part B Gear Train - definition, Its function, types, uses, speed, torque generated in it,

	Transmitted power, direction of rotational speed [6 hrs] Revision problem classes [2 hrs] Gyroscope - definition, Its function (Airplanes, ships, missiles, etc), types, uses, speed, torque generated in it, Transmitted power, direction of rotational speed [6 hrs] Revision problem classes [2 hrs] Velocity and acceleration diagram - Its uses, the way it is used, the skill required for drawing, the types of systems used Revision problem classes [3 hrs]
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in presenting this unit is the use of practical examples that show the importance of the topic and how to benefit from theoretical and practical information in the future in practice. Encouragement Students participate in the exercises, while simultaneously refining and expanding them their critical thinking skills. Theoretical information is refined by performing simple, important experiments Interesting for students.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	123	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Flywheel - Crank Effort Diagram
Week 2	Governor

Week 3	Governor
Week 4	Balancing of Rotating Masses
Week 5	Balancing of Reciprocating Masses
Week 6	Mechanical Clutch
Week 7	Mechanical Clutch
Week 8	Belt Drive
Week 9	Gear Train
Week 10	Gear Train
Week 11	Velocity Diagram
Week 12	Acceleration Diagram
Week 13	Gyroscope
Week 14	Gyroscope
Week 15	Cams
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Brake
Week 2	Lab 2: Clutch
Week 3	Lab 3: Belt Drive
Week 4	Lab 4: Rotating Balance
Week 5	Lab 5: Flywheel
Week 6	Lab 6: Gyroscope
Week 7	Lab 7: Gear Train

Code	Course/Module Title	ECTS	Semester
	Theory of machine	8	Six
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
4	8	123	77

Description
Theory of machines achieves an important benefit for mechanical engineering students, through which the movement of the rotating and sliding parts (speed and acceleration) is studied in the various mechanical systems within the engines and the various machines used in factories, in addition to how to deal with these parts in terms of balance and stabilization of the required movement path of the moving part. In addition to studying some important devices in the field of mechanical engineering, which are used to control the outputs of machines and machines (clutch, belt drive, gyroscope, flywheel and governor) As well as studying the rotational speed of the types of gears commonly used in mechanical systems and how to transmit movement between parts of machines and machines.

Module Information					
معلومات المادة الدراسية					
Module Title	Electrical Machines		Module Delivery الرجاء الاستفادة من الجدول آخر صفحة		
Module Type	B		☐ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	MEC3318				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level		UGIII	Semester of Delivery		Six
Administering Department		Mechanical	College	Engineering	
Module Leader	م م رند جعفر		e-mail	rjudoou@uowasit.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	Module Leader's Qualification		Msc
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date		25-6-2026	Version Number	1.0	
Module Aims, Learning Outcomes and Indicative Contents					
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية					
Module Aims أهداف المادة الدراسية		25. Introducing the basic principles of electrical machines. 26. Understand the magnetic field, the reluctance of magnetic materials and air gap. 27. Understand The voltage-current characteristics, voltage regulation of DC			

	generators, speed regulation of DC motors 28. Working principles, construction and operation of dc generator, dc motor and single phase transformers will be studied. 29. Introduction to AC machines 6. To analyze performance aspects of various testing methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Student will be able to: 33. Explain construction, working principle in DC Machines - Generator, Motor and AC Machines-Transformer. 34. Understand different excitation methods of DC machines. 35. Classify various machines and understand - characteristics, performance parameters of DC generators, DC motors, transformer, 36. Analyze voltage-current characteristics, commutation of DC generators and speed regulation of DC motors 37. Analyze various performance parameters of above machines. 38. Solve complex problems in machines which is useful for competitive exams.
Indicative Contents المحتويات الإرشادية	Inductive contents include the following: • Electromagnetic, magnetic field, reluctance & air gap • DC machines (dc generator), construction, working principle, emf equation & type of dc generator. • Characteristics of dc generator(o.c. characteristics, external, self excited series excited characteristics • Application of dc machine • Losses in dc machine • DC machines (dc motor), construction, working principle, back emf equation & type of dc motor • Torque, armature torque& shaft torque, • Speed of dc motor • Ac machine • construction, working principle of transformer

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1- Giving theoretical lectures directly in the classroom. 2- Reports and studies. 3- Using clarification tools 4- Direct discussion by asking questions and opening the door for dialogue and interaction with students 5- Developing and enhancing the student's thinking skill and moving him to a higher level of thinking 6- Raising the spirit of cooperation and working within a team 7- Bringing out creative ideas among students by raising the spirit of
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Electromagnetic theory
Week 2	DC machine (generator) (Quiz-1)
Week 3	Armature windings, types of dc generator
Week 4	EMF equation of generator, Dc generator characteristics (Quiz-2)
Week 5	Applications of dc generators, Critical Field resistance for a shunt generator
Week 6	Armature reaction (Quiz-3)
Week 7	Losses in a DC machine, DC motor principle, back emf, condition for max.power
Week 8	Mid Exam
Week 9	DC motor principle, back emf, condition for max.power
Week 10	Type of DC Motor
Week 11	Torque, armature torque& shaft torque,
Week 12	Speed of dc motor
Week 13	AC machines (Quiz-4)
Week 14	Transformer
Week 15	Transformer
Week 16	Preparatory week before the final Exam

Code	Course/Module Title	ECTS	Semester
	Electrical Machines	3	Six
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	2	33	42
Description			
The machines which are operated in relation with electrical energy are called electric machines or electrical machines. In electrical machines, either input or output or both can be electricity. The electric machines are of three main types, transformer, generator, and motor. Electrical Transformer: In the transformer, both input and output are electrical power. Electrical Generator: In a generator, the input is mechanical power and the output is electrical power. Electrical Motor: In a motor, the input is electrical power and output is mechanical power. Electrical Machines can also be categorized as static machine and dynamic machine. The transformer is an example of static electrical machine. Motor and generator both are dynamic electrical machine. When a conductor is moved in a magnetic field, emf is induced in the conductor. This is the principle of dynamically induced emf. Depending on that principle, all electrical generators work. There are two types of generator – DC generator, AC generator or alternator. DC Generator: In DC generator armature (assembly of conductors) is the rotor and electromagnetic poles are attached on the stator. When the rotor rotates in the stator alternating current is induced in the armature and collected through commutator segments attached to the shaft of the motor. The generated alternating current in the armature gets converted to direct current through commutator. The electric motors can categorised as a DC motor or an AC motor. DC Motor: these motors are fed by DC supply through commutator segments attached to the shaft of the motor. The motor rotates on basis of Fleming's left hand rule. DC motor can be categorised as separately excited DC motor, shunt wound DC motor, series wound DC motor, compound wound DC motor. At the end of the course the student will be able to: • explain construction and operation principle of dc motors and dc generators • Describe the working principle of a DC motor and a DC generator. • List and describe the main components of a DC generator. • Describe the operation of, and factors affecting output and direction of current flow in DC generators. • Describe the operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors. • Describe the difference between motors and state the use of series wound, shunt wound			

and compound DC motors.

- explain construction and operation principle of transformers
- Describe the principle of transformer and state power losses.
- Know different types of transformers.