

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



Guide for Academic Program Description and Course Description

2026 / 2025

Introduction

An academic program is a coordinated and organised package of courses that includes procedures and experiences arranged as study modules. Its primary purpose is to build and refine graduates' skills, making them qualified to meet labour-market requirements. The program is reviewed and evaluated annually through internal or external audit procedures, such as the External Examiner Program.

The Academic Program Description provides a concise summary of the main characteristics of the program and its courses, showing the skills that students are expected to develop based on the program's academic objectives. This description is considered the cornerstone for obtaining program accreditation and is written by teaching staff under the supervision of the scientific committees in the academic departments.

This guide (second edition) includes an updated description of the academic program, incorporating revisions to the items and sections of the previous edition in light of recent developments in Iraq's educational system. It covers the traditional program description (annual and semester systems), as well as the academic program description circulated under the Studies Directorate letter No. T.M3/2906 dated 3/5/2023, for programs that adopt the Bologna Process as their basis.

Key Concepts and Terms

Academic Program Description	Provides a concise summary of the program's vision, mission, and objectives, including a precise description of the targeted learning outcomes according to specific learning strategies.
Course Description	Provides a concise summary of the main characteristics of the course and the learning outcomes the student is expected to achieve, demonstrating whether the student has made maximum use of available learning opportunities. It is derived from the program description.
Program Vision	An ambitious picture of the future of the academic program, aiming to be a developed, inspiring, motivating, realistic, and applicable program.
Program Mission	Clarifies the objectives and activities needed to achieve them in a brief manner, and identifies the program's development paths and directions.
Program Objectives	Statements that describe what the academic program intends to achieve within a specific time period; they must be measurable and observable.
Curriculum Structure	All courses/subjects included in the academic program according to the adopted learning system (semester, annual, or Bologna Pathway), whether they are requirements of the Ministry, University, College, or Department, along with the number of credit hours.
Learning Outcomes	A consistent set of knowledge, skills, and values acquired by the student upon successful completion of the academic program. Learning outcomes must be specified for each course in a manner that achieves the program's objectives.
Teaching & Learning Strategies	Strategies used by faculty members to develop student teaching and learning; they are plans followed to reach learning objectives, describing all in-class and out-of-class activities to achieve the program's learning outcomes.

Academic Program Description Form – Colleges and Institutes

University	Northern Technical University	College	Technical College of Hawija
Department	Mechatronics Engineering Technology	Study System	Bologna
Program Name	Bachelor of Mechatronics Engineering Technology	Description Prepared On	2025-09-1
File Completed On	2025-09-01		

Academic Program Description Form

University Name: Northern Technical University

College: College. Hawija Technology

Scientific Department: Department of Mechatronics Engineering Technology

Academic or Professional Program Name: Bachelor of Mechatronics Engineering Technology

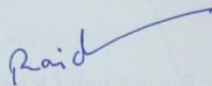
Final Certificate Name: Bachelor of Mechatronics Engineering Technology

Curriculum: Bologna Process

Description Preparation Date: 1 / 9 / 2025

File Fill Date: 1 / 9 / 2025

Signature:

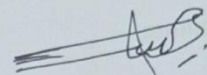


Scientific Assistant's Name: Asst. Prof.

Raed Waad Allah Dawood

Date : 8 / 9 / 2025

Signature:



Head of Department:

Asst. Prof. Dr. Zaki Majeed Abdullah

Date : 8 / 9 / 2025

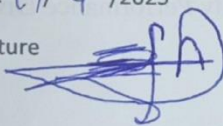
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Quality Assurance and Performance Evaluation Division

Name of the Director of the Quality Assurance and Performance Evaluation Division: Eng.
Mohammed Jawad Ahmed

Date : 14 / 9 / 2025

Signature



Dean's Endorsement

Asst. Prof. Dr. Ahmed Abdullah Danook

Date: 15 / 9 / 2025

Academic Program Description

The Mechatronics Engineering Technology program provides the essential curriculum for learning and training in the skills required to build devices and applications needed in mechatronic systems, covering both theoretical and practical aspects. The program runs over four academic years, after which graduates are awarded a Technical Bachelor's degree in the above specialization.

1 – Educational Institution	Technical College of Hawija
2 – Department	Mechatronics Engineering Technology
3 – Program Name	Bachelor of Mechatronics Engineering Technology
4 – Final Degree Title	Technical Bachelor in Mechatronics Engineering Technology
5 – Study System	Bologna
6 – Accredited Accreditation Program	—
7 – Other External Influences	There is a strong relationship with the labour market that receives the department's graduates. Labour-market feedback is taken into consideration when developing the study curriculum.
8 – Description Preparation Date	1 / 09 / 2025
9 – Program Objectives	Prepare and graduate an engineering cadre that meets the core technical and knowledge requirements to be a high-quality engineering and

	technical resource in the fields of mechanics, control, robotics, and computing. Reinforce the principle of community participation to spread the culture of technical education and its applications. Graduate confident scientific teams with strong skills and understanding in the field of devices and applications required in mechatronic systems, from both theoretical and practical perspectives. Organise training and qualification courses by a competent team, with the participation of department students, to integrate them into the labour market. Strengthen scientific and administrative relations with corresponding scientific and engineering colleges, as well as ministries, industrial companies, and other relevant institutions, regarding teaching needs, re-qualification, and development of educational programs. Develop and continuously improve all scientific and administrative plans and curricula needed to achieve the above points, and follow up on feedback for the work of the study plan or curriculum directorate.
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10 – Required Learning Outcomes, Teaching, Learning, and Assessment Methods

A – Knowledge and Understanding

A1 – Introduce students to concepts of mechatronics engineering.

A2 – Enable students to understand practical applications in mechatronics engineering technology.

A3 – Ability to develop mechatronic systems and find optimal solutions to problems that keep pace with technological advances.

A4 – Ability to participate with specialists in conducting research in mechatronics applications and finding alternatives in the field.

B – Subject-Specific Skills B1 – Analysis B2 – Design B3 – Implementation
C – Attitudinal and Value Goals C1 – Motivate and encourage students to understand and absorb theoretical material, and encourage them to design and implement their own engineering designs in the Mechatronics Engineering Technology Department. C2 – Encourage teamwork through discussions, group solutions, and participation in annual exhibitions for manufacturing specialised devices in the Mechatronics Technology Department. C3 – Ability to perform corrective calculations for manufacturing devices and systems in the field of specialization.
Teaching & Learning Methods Lecture Laboratory Workshop Structured Training Field Visits
Assessment Methods • Oral Examinations • Written Examinations • Semester Exams • Final Exams • Daily Assessment

Level	Semester	No.	Code	Course Name (Arabic)	Course Name (English)	Lang.	In-class	Online	Lab	Practical	Review
Year 1	Semester 1	1	NTU 100	والديمقراطية الانسان حقوق	Human Rights and Democracy	Arabic	2	0	0	0	0
		2	HTCMT 100	الرياضيات	Mathematics	English	4	0	0	0	2
		3	HTCMT 101	(السكوني) الهندسي الميكانيك	Engineering Mechanics (Statics)	English	3	0	0	0	2
		4	HTCMT 102	بأوتوكاد الهندسي الرسم	Engineering Drawing with AutoCAD	English	0	0	4	0	0
		5	HTCMT 103	المستمر للتيار الكهربائية الدوائر	DC Electric Circuits	English	2	0	2	0	0
		6	NTU 101	الإنكليزية اللغة	English Language	English	2	0	0	0	0
	Semester 2	1	NTU 102	حاسوب تطبيقات	Computer Applications	English	2	0	3	0	0
		2	HTCMT 104	الرقمي المنطق	Digital Logic	English	2	0	2	0	0
		3	NTU 103	العربية اللغة	Arabic Language	Arabic	2	0	0	0	0
		4	HTCMT 105	ومعامل ورش	Workshop and Laboratories	Arabic	0	0	4	0	0
		5	HTCMT 106	(المتحرك) الهندسي الميكانيك	Engineering Mechanics (Dynamics)	English	3	0	0	0	2
		6	HTCMT 107	المتناب للتيار الكهربائية الدوائر	AC Electric Circuits	English	2	0	2	0	0
		7	HTCMT 108	والبرمجة الحاسوب نظم	Computer Systems and Programming	English	2	0	3	0	0
Year 2	Semester 1	1	HTCMT 200	إلكترونيك	Electronics	English	2	0	2	0	0
		2	HTCMT 201	متقدمة رياضيات	Advanced Mathematics	English	4	0	0	0	2
		3	HTCMT 202	الموانع ميكانيك	Fluid Mechanics	English	2	0	2	0	0
		4	HTCMT 203	والتصنيع المواد هندسة	Material and Manufacturing Engineering	English	2	0	4	0	0
		5	HTCMT 204	(مستمر تيار) كهربائية مكائن	DC Electrical Machines	English	2	0	2	0	0
		6	NTU 200	البعث جرائم	Ba'ath Crimes	Arabic	2	0	0	0	0
	Semester 2	1	HTCMT 205	(متناب تيار) كهربائية مكائن	AC Electrical Machines	English	2	0	2	0	0
		2	HTCMT 206	والآلات المتحسسات	Sensors and Instrumentation	English	2	0	3	0	0
		3	HTCMT 207	المواد مقاومة	Strength of Materials	English	2	0	3	0	0
		4	HTCMT 208	إلكترونية دوائر	Electronic Circuits	English	2	0	3	0	0
		5	NTU 201	المهنة أخلاقيات	Professional Ethics	Arabic	2	0	0	0	0
		6	HTCMT 209	والهيدروليكية الهوائية الأنظمة	Pneumatic and Hydraulic Systems	English	2	0	3	0	0
Year 3	Semester 1	1	HTCMT 300	الحراري الديناميك	Thermodynamics	English	2	0	2	0	0
		2	HTCMT 301	الآلي التحكم هندسة	Automatic Control Engineering	English	2	0	3	0	0
		3	HTCMT 302	الرقمية الاتصالات	Digital Communication	English	2	0	2	0	0
		4	HTCMT 303	الهندسية التحليلات	Engineering Analysis	English	2	0	2	0	0
		5	HTCMT 304	القدرة إلكترونيات	Power Electronics	English	2	0	3	0	0
		6	HTCMT 305	(PLC) للبرمجة قابل منطقي تحكم	Programmable Logic Controller (PLC)	English	2	0	3	0	0
	Semester 2	1	HTCMT 306	المعلومات واكتساب البيئي الربط	PC Interface and Data Acquisition	English	2	0	3	0	0
		2	HTCMT 307	المكائن نظرية	Theory of Machines	English	2	0	3	0	0
		3	HTCMT 308	السيطرة أنظمة تصميم	Control System Analysis and Design	English	2	0	3	0	0
		4	HTCMT 309	الدقيق المعالج	Microcontroller	English	2	0	3	0	0

Level	Semester	No.	Code	Course Name (Arabic)	Course Name (English)	L.ang.	In-class	Online	Lab	Practical	Review
Year 4		5	HTCMT 310	الروبوتات أساسيات	Fundamentals of Robotics	English	2	0	3	0	0
		6	HTCMT 311	الحرارة انتقال	Heat Transfer	English	2	0	2	0	0
	Semester 1	1	HTCMT 400	الروبوت على والسيطرة التحليل	Robotics Analysis and Control	English	2	0	2	0	0
		2	HTCMT 401	العصبية والشبكة الاصطناعي الذكاء	AI and Neural Networks	English	2	0	2	0	0
		3	HTCMT 402	المشروع	Final Year Project	English	0	0	4	0	0
		4	HTCMT 403	الميكاترونيكس تطبيقات	Mechatronics Applications	English	2	0	4	0	2
		5	HTCMT 404	المكانن أجزاء تصميم	Mechanical Design	English	2	0	2	0	0
		6	HTCMT 405	الطاقة ومشغلات محولات	Transducers and Actuators	English	2	0	2	0	0
	Semester 2	1	HTCMT 406	الميكاترونيكس أنظمة تصميم	Mechatronics System Design	English	2	0	2	0	0
		2	HTCMT 407	CAD/CAM	CAD/CAM	English	2	0	3	0	0
		3	HTCMT 408	الميكاترونيكس في خاصة تطبيقات	Special Applications in Mechatronics	English	2	0	0	0	0
		4	HTCMT 409	الرقمية الإشارة معالجة	Digital Signal Processing	English	2	0	2	0	3
		5	HTCMT 410	الرقمية الصور معالجة	Digital Image Processing	English	2	0	3	0	0
		6	HTCMT 411	الرقمية السيطرة	Digital Control	English	2	0	2	0	0
Summer Training — One Month Duration											

12 – Planning for Personal Development

Personal development is achieved through periodic review of academic practical curricula and staying up to date with the latest developments in the field of mechatronics engineering.

13 – Admission Criteria

Previous Requirements	• Graduates of the Preparatory School – Scientific Branch • Top ten graduates from corresponding departments of the Middle Technical University institutes
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14 – Key Information Sources about the Program

- Study Plan of the Mechatronics Engineering Technology Department
- Special Instructions of the Northern Technical University

Curriculum Skills Matrix

Please tick the boxes corresponding to the individual program learning outcomes that are subject to assessment in each course.

Level	Code	Course Name	Mandatory / Optional	A – Knowledge & Understanding				B – Subject-Specific Skills				C – Attitudinal & Value Goals				D – General & Transferable Skills			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Year 1	NTU 100	Human Rights and Democracy	Mandatory	✓						✓							✓		
	HTCMT 100	Mathematics	Mandatory	✓						✓							✓		
	HTCMT 101	Engineering Mechanics (Statics)	Mandatory	✓				✓	✓			✓	✓			✓			
	HTCMT 102	Engineering Drawing with AutoCAD	Mandatory					✓					✓			✓			
	HTCMT 103	DC Electric Circuits	Mandatory	✓						✓			✓				✓		
	NTU 101	English Language	Mandatory		✓			✓					✓					✓	
	NTU 102	Computer Applications	Mandatory										✓						
	HTCMT 104	Digital Logic	Mandatory		✓					✓			✓				✓		
	NTU 103	Arabic Language	Mandatory		✓			✓					✓						✓
	HTCMT 105	Workshop and Laboratories	Mandatory										✓						
	HTCMT 106	Engineering Mechanics (Dynamics)	Mandatory						✓			✓				✓			
	HTCMT 107	AC Electric Circuits	Mandatory		✓			✓					✓						✓
	HTCMT 108	Computer Systems and Programming	Mandatory	✓	✓				✓	✓			✓	✓			✓		
Year 2	HTCMT 200	Electronics	Mandatory	✓						✓							✓		
	HTCMT 201	Advanced Mathematics	Mandatory	✓					✓								✓		
	HTCMT 202	Fluid Mechanics	Mandatory	✓				✓	✓			✓	✓			✓			
	HTCMT 203	Material and Manufacturing Engineering	Mandatory					✓					✓			✓			

Level	Code	Course Name	Mandatory / Optional	A – Knowledge & Understanding				B – Subject-Specific Skills				C – Attitudinal & Value Goals				D – General & Transferable Skills			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
	HTCMT 204	DC Electrical Machines	Mandatory	✓						✓			✓				✓		
	NTU 200	Ba'ath Crimes	Mandatory		✓				✓					✓				✓	
	HTCMT 205	AC Electrical Machines	Mandatory						✓										
	HTCMT 206	Sensors and Instrumentation	Mandatory		✓					✓			✓				✓		
	HTCMT 207	Strength of Materials	Mandatory		✓			✓					✓						✓
	HTCMT 208	Electronic Circuits	Mandatory										✓						
	NTU 201	Professional Ethics	Mandatory						✓			✓				✓			
	HTCMT 209	Pneumatic and Hydraulic Systems	Mandatory		✓			✓					✓						✓
Year 3	HTCMT 300	Thermodynamics	Mandatory	✓						✓							✓		
	HTCMT 301	Automatic Control Engineering	Mandatory	✓						✓							✓		
	HTCMT 302	Digital Communication	Mandatory	✓				✓	✓			✓	✓			✓			
	HTCMT 303	Engineering Analysis	Mandatory					✓					✓			✓			
	HTCMT 304	Power Electronics	Mandatory	✓						✓			✓				✓		
	HTCMT 305	Programmable Logic Controller (PLC)	Mandatory		✓			✓					✓					✓	
	HTCMT 306	PC Interface and Data Acquisition	Mandatory		ش				✓										
	HTCMT 307	Theory of Machines	Mandatory		✓					✓			✓				✓		
	HTCMT 308	Control System Analysis and Design	Mandatory		✓			✓					✓						✓
	HTCMT 309	Microcontroller	Mandatory										✓						
	HTCMT 310	Fundamentals of Robotics	Mandatory						✓			✓				✓			
	HTCMT 311	Heat Transfer	Mandatory		✓			✓					✓						✓

Level	Code	Course Name	Mandatory / Optional	A – Knowledge & Understanding				B – Subject-Specific Skills				C – Attitudinal & Value Goals				D – General & Transferable Skills			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3	D4
Year 4	HTCMT 400	Robotics Analysis and Control	Mandatory	✓						✓							✓		
	HTCMT 401	AI and Neural Networks	Mandatory	✓						✓							✓		
	HTCMT 402	Final Year Project	Mandatory	✓				✓	✓			✓	✓			✓			
	HTCMT 403	Mechatronics Applications	Mandatory					✓					✓			✓			
	HTCMT 404	Mechanical Design	Mandatory	✓						✓			✓				✓		
	HTCMT 405	Transducers and Actuators	Mandatory		✓			✓					✓					✓	
	HTCMT 406	Mechatronics System Design	Mandatory						✓										
	HTCMT 407	CAD/CAM	Mandatory		✓					✓			✓				✓		
	HTCMT 408	Special Applications in Mechatronics	Mandatory		✓			✓					✓						✓
	HTCMT 409	Digital Signal Processing	Mandatory										✓						
	HTCMT 410	Digital Image Processing	Mandatory						✓			✓				✓			
	HTCMT 411	Digital Control	Mandatory		✓			✓					✓						✓

— End of Academic Program Description —

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Computer Applications		Module Delivery	
Module Type	S		☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	NTU 102			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	UGI	Semester of Delivery		one
Administering Department	MT	College	HTC	
Module Leader	Ayad T. Ibrahim		e-mail	ayadtahseen_htc@ntu.edu.iq
Module Leader's Acad. Title	Associate Lecturer	Module Leader's Qualification		MSc
Module Tutor	Name (if available)	e-mail	E-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	2025-09-01	Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aims of the module are to: 1. Understanding Fundamental Concepts: The course aims to provide students with a solid understanding of fundamental concepts in computer applications. This includes the basics of hardware, software, and their components, as well as the principles of computing and data processing. 2. Practical Application of Tools: Students will learn to use essential software tools, such as word processors, spreadsheets, and presentation software, to perform various tasks effectively. 3. Problem-Solving Skills: The course aims to develop problem-solving skills through practical exercises, such as troubleshooting common hardware and software issues. 4. Internet and Research Skills: Students will gain proficiency in using the Internet for research, including web browsing, email communication, and document collaboration. 5. Introduction to Advanced Topics: The course introduces students to emerging technologies, such as artificial intelligence, and prepares them for more advanced studies in computing and IT. 6. Preparation for Real-World Applications: The course

	aims to equip students with the skills necessary to apply computer applications in real-world scenarios, such as education, healthcare, and business.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	With the successful completion of this Module, students will be able to: 1. Understand the fundamental concepts of computer systems, including hardware, software, and their components. 2. Demonstrate proficiency in using word processors, spreadsheets, and presentation software for various tasks. 3. Conduct research using the Internet and collaborate on documents effectively. 4. Troubleshoot common hardware and software issues. 5. Understand the basics of artificial intelligence and its applications. 6. Apply computer applications in real-world scenarios, such as education, healthcare, and business.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Part A - Introduction to Computer Concepts • Overview of hardware and software components. • Concepts of computing, data, and information • Applications of Information and Communication Technology (ICT). [14 hrs] Part B - Software Tools. • Word processing: Document creation, formatting, and printing. • Spreadsheets: Data manipulation, formulas, and functions. • Presentation software: Slide creation, formatting, and

	presentation. [13 hrs]
	Part C - Internet and Research Skills. • Basics of computer networks, LAN, WAN, and the Internet. • Web browsing, search engines, and understanding URLs. • Email communication and document collaboration. [13 hrs]
	Part D - Introduction to Artificial Intelligence. • Basics of AI, its history, and applications in daily life. • Ethical considerations and challenges in AI. [5 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy for delivering this module is to encourage students' participation in practical exercises while refining and expanding their critical thinking skills. This will be achieved through interactive classes, tutorials, and hands-on activities using computers and software tools.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/Sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3.2
Unstructured SWL (h/Sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.8
Total SWL (h/Sem)			

الحمل الدراسي الكلي للطلاب خلال الفصل	75
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Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	10% (10)	5, 10	LO #1, 2, 3,8,9,10
	Assignments	1	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to computer systems and components
Week 2	Overview of hardware and software
Week 3	Basics of word processing
Week 4	Advanced word processing techniques
Week 5	Basics of spreadsheets
Week 6	Advanced spreadsheet techniques
Week 7	Basics of presentation software

Week 8	Advanced presentation techniques
Week 9	Introduction to the Internet and web browsing
Week 10	Midterm Exam + Email communication and collaboration
Week 11	Basics of artificial intelligence
Week 12	Applications of AI in daily life
Week 13	Ethical considerations in AI
Week 14	Real-world applications of computer tools
Week 15	Review and practice
Week 16	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Lab instruments, Reports, Safety, and Rules
Week 2	Introduction to computer systems and components
Week 3	Overview of hardware and software
Week 4	Basics of word processing
Week 5	Advanced word processing techniques
Week 6	Basics of spreadsheets
Week 7	Advanced spreadsheet techniques
Week 8	Mid-term Exam
Week 9	Basics of presentation software
Week 10	Advanced presentation techniques
Week 11	Introduction to the Internet and web browsing
Week 12	Basics of artificial intelligence
Week 13	Applications of AI in daily life
Week 14	Ethical considerations in AI
Week 15	Real-world applications of computer tools

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		Yes
Recommended Texts	- Graham Brown, David Watson, “Cambridge IGCSE Information and communication Technology”, 3rd Edition (2020) - Alan Evan, Kendall Martin, Mary Anne Poasty, “Technology In Action Complete”, 16th Edition (2020). - Ahmed Banafa, “Introduction to Artificial Intelligence (AI), 1st Edition (2024) - الخضر علي الخضر بحاث، "اساسيات الحاسوب" 2016 - الدكتور عادل عبد النور، "مدخل الى الذكاء الاصطناعي" 2005	No
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Digital Logic		Module Delivery
Module Type	BASIC		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar
Module Code	HTCMT 104		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level		UGII	
Administering Department		MT	College
Module Leader		Amer Ahmed Abed	e-mail
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification
Module Tutor		Name (if available)	e-mail
Peer Reviewer Name		Name	e-mail
Scientific Committee Approval Date		01/09/2025	Version Number
			1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرادة	
Module Aims أهداف المادة الدراسية	The aim of this module is to provide students with a strong foundation in digital design and its applications in real-world systems. Upon completing the module, students will be able to: 1. Develop a Deep Understanding of Digital Systems Introduce students to the fundamental principles of digital logic, enabling them to understand how digital systems function and how they are applied in various fields of electronics and computer engineering. 2. Enhance Problem-Solving Skills in Digital Circuit Design Equip students with the necessary tools and techniques to solve complex problems involving logic gates, Boolean algebra, and digital arithmetic. 3. Build Practical Skills in Simulation and Circuit Design Provide hands-on experience with industry-standard simulation tools such as Logisim, Proteus, or Multisim for digital circuit design and testing. 4. Foster Teamwork and Communication Skills in Engineering Projects Encourage collaboration and teamwork through mini-projects where students will design digital systems as part of a group. Strengthen communication skills by presenting and documenting circuit designs and problem-solving approaches through clear and concise technical reports.

	and presentations .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of this module, students will be able to: 1. Knowledge & Understanding - Explain the fundamental concepts of digital logic, including the difference between analog and digital systems - Identify and describe different number systems (binary, octal, decimal, hexadecimal) and perform number conversion - Understand the principles of Boolean algebra, including simplification and De Morgan's theorems. - Recognize and describe the functions of logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR) and their applications 2. Cognitive & Analytical Skills - Solve problems involving binary arithmetic operations, including addition, subtraction, multiplication, and division. - Simplify Boolean expressions using Boolean algebra rules and theorems - Analyze and design basic combinational logic circuits using logic gates - Develop logic circuits using universal gates (NAND, NOR) and their circuit implementations. 3. Practical & Technical Skills - Design and implement logic circuits using simulation tools such as Logisim, Proteus, or Multisim. - Construct and test basic arithmetic circuits (Half Adder, Full Adder, Half Subtractor, Full Subtractor). - Apply logic gate concepts in real-world applications and digital systems 4. Communication & Teamwork Skills - Work effectively in teams to design and implement small digital systems - Present solutions to logic circuit problems clearly using truth tables, Boolean expressions, and circuit diagrams. - Document and explain digital logic designs using appropriate tools and presentations.

**Indicative
Contents**

المحتويات الإرشادية

1. Introduction to Digital Logic
 - Difference between Analog & Digital Signals
 - Introduction to Binary Logic
 - Applications of Digital Systems in real-world electronics
2. Number Systems & Conversions
 - Decimal (Base 10), Binary (Base 2), Octal (Base 8), Hexadecimal (Base 16)
 - Conversion between different number systems
 - Binary Addition, Subtraction, Multiplication, and Division
 - 1's & 2's Complement Representation (for negative numbers)
3. Boolean Algebra & Simplification
 - Basic Boolean Operations (AND, OR, NOT)
 - Boolean Theorems and simplification techniques
 - De Morgan's Theorems
 - Truth Tables for Boolean expressions
4. Logic Gates & Their Applications
 - Basic Logic Gates: AND, OR, NOT
 - Universal Gates: NAND, NOR
 - Exclusive Gates: XOR, XNOR
 - Gate-Level Implementation of Boolean Functions
5. Logic Circuit Design & Simplification
 - Karnaugh Maps (K-Maps) for 2, 3, and 4 variables
 - Using NAND & NOR Gates for circuit simplifications
 - Sum of Products (SOP) & Product of Sums (POS) representations
6. Arithmetic Circuits
 - Half Adder & Full Adder
 - Half Subtractor & Full Subtractor
 - Binary Adder/Subtractor Circuits
7. Combinational Circuits (*Brief Overview – Optional*)
 - Multiplexers (MUX) & Demultiplexers (DEMUX)
 - Encoders & Decoders
8. Introduction to Sequential Circuits (*Basic Concept Only*)
 - Difference between Combinational & Sequential Circuits
 - Introduction to Flip-Flops (SR, JK, D, T) – Conceptual Only

	9. Practical Applications & Review • Practical Examples of Logic Gates in Electronics • Simple Digital Logic Projects • Review & Exam Preparation
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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 discussions, while at the same time refining and expanding their critical thinking skills. This will be achieved through; 1- Lectures - aim to deliver fundamental knowledge in relation to dynamic analysis and the application to practical examples. 2- Tutorial sessions - are deployed to illustrate the application of fundamental knowledge of dynamic analysis to different practical exercises. 3- Assignments - are arranged to provide the opportunity for students to search for information, analyze machines with knowledge obtained, and present the completed tasks.

Student Workload (SWL) الحمل الدراسي للطالب			
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	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.44
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 12	LO #1, 2, 9-11
	Assignments	2	10% (10)	7, 13	LO # 1-6, 9-12
	Projects / Lab.	1	10% (10)	14	LO # 1-7, 9-13
	Reports	2	10% (10)	7,13	LO # 3, 4 and 5
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Digital Logic: Digital vs. analog signals, number systems, Overview lecture, real-life examples discussion.
Week 2	Number Systems (1): Decimal and binary systems, conversions, Exercises on decimal-to-binary conversion.
Week 3	Number Systems (2): Octal and hexadecimal, interconversion, Practical problems on number conversions.
Week 4	Binary Representation: 1's and 2's complement, binary arithmetic, Solving binary arithmetic problems.
Week 5	Introduction to Boolean Algebra: Fundamental laws, basic operations, Boolean expressions simplification exercises.
Week 6	Basic Logic Gates: AND, OR, NOT – Truth tables and circuits.
Week 7	Compound Logic Gates: NAND, NOR, XOR, XNOR, Practical circuit design using logic gates.
Week 8	Midterm Exam
Week 9	Logic Circuit Simplification: De Morgan's Theorems, Karnaugh Maps (K-Maps), Hands-on practice with Boolean simplifications.
Week 10	Expressions & Circuit Implementation: Converting Boolean expressions to circuits, Circuit design based on Boolean equations.
Week 11	Simplification using NAND & NOR: Implement circuits using only NAND/NOR gates, designing practical circuits.
Week 12	Applications of Logic Gates: Half Adder & Full Adder circuits, Mini project on arithmetic circuits.
Week 13	Introduction to Sequential Circuits: Basics of Flip-Flops, combinational vs. sequential logic.
Week 14	General Review: Solving comprehensive problems on numbers and gates.
Week 15	Group review session and exam preparation.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-2	Introduction to Basic Logic Gates
Week 3-4	Boolean Algebra & Karnaugh Map Simplification
Week 5-6	Half Adder & Full Adder Circuits
Week 7	Half Subtractor & Full Subtractor Circuits
Week 8	Mid Exam
Week 9-10	Sequential Logic – Flip-Flops
Week 11	Design of Counters
Week 12	Shift Registers
Week 13-14	Mini Project – Applied Digital Logic
Week 15	Final Review & Assessment

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	“Digital Design” – M. Morris Mano & Michael D. Ciletti	No
Recommended Texts	Introduction to Logic Circuits & Logic Design” – Brock J. LaMeres	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks with decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Drawing with Auto CAD		Module Delivery		
Module Type	c	☐ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	HTCMT 102				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level	1	Semester of Delivery		1	
Administering Department	Mechatronics Techniques Engineering		College	Technical College-Hawija	
Module Leader	Mahmood A.Jolan		e-mail	mahmoud.A.julan@ntu.edu.iq	
Module Leader's Acad. Title	assistant Lecturer		Module Leader's Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name	Name		e-mail	E-mail	
Scientific Committee Approval Date	15/08/2022		Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	• Understand the basics of engineering drawing and the importance of using it in design. • Master the use of AutoCAD to draw and modify engineering shapes. • Learn the basic drawing tools in AutoCAD and apply them practically. • Acquire skills in using editing tools to organize and modify engineering drawings. • Learn how to use layers to organize and manage drawings effectively. • Apply precision in measurements and add dimensions to engineering drawings. • Insert texts and comments in drawings to better clarify information. • Prepare for practical tests that enhance practical understanding of the tools and skills acquired. • Acquire two- and three-dimensional drawing skills using advanced AutoCAD tools. • Learn how to create symbols and components and use them in engineering designs. • Prepare and prepare for printing and final output of drawings. Implement practical projects using the acquired

	skills to enhance understanding
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. .1Ability to install and use AutoCAD. 2. .2Master basic drawing and editing tools. 3. .3Organize drawings using layers. 4. .4Apply measurements and add dimensions accurately. 5. .5Insert text and comments into drawings. 6. .6Draw 2D and 3D shapes. 7. .7Create and use symbols and components. 8. .8Prepare drawings for printing and final output. 9. .9Implement integrated engineering design projects. 10. .10Pass practical tests covering acquired AutoCAD skills
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy I have started in delivering this unit is to encourage student participation in discussions, while at the same time tacticizing critical thinking skills. I will achieve this through; 1- Lectures - highlighting the basic concepts and knowledge regarding engineering drawing. 2- Tutorials - are published to illustrate the application of basic knowledge of engineering drawing methods.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	0
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي المختبري

	Material Covered
Week 1	Introduction to AutoCAD Engineering Drawing
Week 2	Basic drawing tools in AutoCAD
Week 3	Editing tools in AutoCAD
Week 4	Layers and organizing graphics
Week 5	Measurements and dimensions
Week 6	Writing texts and comments
Week 7	Midterm exam
Week 8	Advanced 2D Drawing
Week 9	Create Symbols and components
Week 10	3D drawing
Week 11	3D shape manipulation
Week 12	Print preparation and final output
Week 13	Small projects
Week 14	Comprehensive review of lessons
Week 15	Final semester exam
Week 16	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• المصادر: "Engineering Drawing and Design" by David A. Madsen and David P. Madsen This book is considered a comprehensive reference in the field of engineering drawing, as it covers the basic principles of engineering drawing in general and provides practical applications using AutoCAD. The book contains chapters dedicated to learning two-dimensional and three-dimensional drawing, in addition to organizing drawings and preparing them for printing ISBN: 978-1111309572 • "Mastering AutoCAD 2021 and AutoCAD LT 2021" by Brian C. Benton and George Omura This book is a comprehensive guide to learning AutoCAD, in which the authors cover the basic and advanced tools for engineering drawing and design. The book includes practical exercises and tips on how to use various AutoCAD tools in engineering contexts.	NO

	ISBN: 978-1119580089	
Recommended Texts	Technical Drawing with Engineering Graphics" by Frederick E. Giesecke, Alva Mitchell, Henry C. Spencer, Ivan L. Hill, John T. Dygdon, and James E. Novak: This book is a classic reference in the field of engineering drawing, and includes teaching traditional and digital drawing using tools such as AutoCAD. The book covers advanced topics such as 3D drawing, layers, and graphics control, making it suitable for engineering students.. ISBN: 978-0134306414	No
Websites	• الموقع الإلكتروني "Techopedia" رابط الموقع Techopedia : 	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks with decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	DC Electrical Circuits		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	HTCMT 107		
ECTS Credits	6		
SWL (hr/sem)	100		
Module Level	UGI	Semester of Delivery	
Administering Department	MT	College	HTC
Module Leader	Zaki M. Abdullah	e-mail	drzaki_hwj@ntu.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval	01/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aims of the module are to: <u>Understanding Fundamental Concepts:</u> The course aims to provide students with a solid understanding of fundamental concepts in electrical circuit analysis. This includes voltage, current, resistance, power, etc. <u>Analysis Methodologies:</u> Students will learn a variety of analysis methods to solve DC circuits, including Kirchhoff's laws and series and parallel circuit analysis. They will gain proficiency in nodal and mesh analysis methods, enabling them to analyze complex circuits systematically.

3. Circuit Simplification: This course aims to provide students with the skills necessary to use methods like Thevenin's and Norton's theorems to simplify complicated DC circuits and find the equivalent circuits.

4. Problem Solving Skills: The course aims to develop problem-solving skills through hands-on activities and problem-solving exercises.

5. Laboratory Experience: The course aims to provide hands-on laboratory experiences where students can apply theoretical knowledge to practical scenarios.

6. Preparation for Advanced Courses: Prepare students for more advanced courses. A solid understanding of this course is essential in electronics, signal processing, control systems, and other specialized areas.

Overall, the Electrical Circuits Analysis I course aims to provide Mechatronics Engineering students with a solid foundation in DC circuit analysis, enabling them to understand, analyze, and design electrical circuits relevant to their field of study.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	With the successful completion of this Module, students will be able to: 1. Understand the fundamental concepts and principles of electric circuits, including circuit elements, systems of units, and voltage-current relations. 2. Demonstrate knowledge of Ohm's Law and its application in analyzing direct current (DC) networks. 3. Apply Kirchhoff's Laws to analyze and solve DC circuits using nodal and mesh analysis methods. 4. Analyze series and parallel resistor combinations and calculate voltage and current division in these configurations. 5. Perform Star (Wye)-Delta transformations to simplify complex resistor networks. 6. Apply source transformations to simplify circuit analysis and calculations. 7. Understand and apply the linearity and superposition theorems in DC circuit analysis. 8. Apply Thevenin's and Norton's theorems to simplify complex circuits into equivalent circuits. 9. Understand and apply the maximum power transfer theorem to optimize power transfer in DC circuits. 10. Analyze the behavior of capacitors and inductors in DC circuits, including their combinations in series and parallel.
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Indicative Contents

المحتويات الإرشادية

Indicative content includes the following.

Part A - Introduction to DC Circuit Concepts

Systems of Units, Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Circuit Diagrams, Nodes, Branches, Loops, and Ohm's Law in the Direct Current (DC) Network. Kirchhoff's laws, Independent and Dependent sources [20 hrs]

Revision problem Classes [3] hrs

Part B - Introduction to Methods of Analysis. Introduction to DC circuit analysis, Fundamentals Resistive networks, voltage and current sources, Voltage and Current Division, Nodal Analysis, and Super node, Mesh Analysis, and Super mesh. [18 hrs]

Part C - Introduction to Circuit Theorems.

Linearity Property, Superposition, Source Transformations, Thevenin and Norton equivalent circuits, and maximum power transfer, [18 hrs]

Part D - Introduction to Capacitors and Inductors.

Introduction to Capacitors in Parallel and Series; Capacitor Current and Voltage, Inductors in Parallel and Series; Inductors Current and Voltage [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب

Structured SWL (h/Sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/Sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.4
Total SWL (h/Sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Discuss the Syllabus, Introduction to Systems of Units
Week 2	Circuit Concepts - Passive and Active Elements, Voltage-Current Relations, and Circuit Diagrams
Week 3	Resistance and Resistivity, Ohm's Law
Week 4	Series and Parallel Resistors with Voltage and Current Division
Week 5	Star (Wye)-Delta Transformations
Week 6	Kirchhoff's Laws: KVL and KCL
Week 7	Nodal Analysis, and Super node
Week 8	Mesh Analysis, and Super mesh
Week 9	Linearity and Superposition,
Week 10	Mid-term Exam + Source Transformations + Independent and Dependent sources
Week 11	Thevenin's theorem
Week 12	Norton theorem
Week 13	Maximum Power Transfer Theorem
Week 14	Examples
Week 15	Review, Practice
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Lab instruments, Reports, Safety, and Rules
Week 2	Practical and colored resistance measurements
Week 3	Electrical Measurements, and use of Breadboards
Week 4	Ohm's law
Week 5	Simple DC Circuits: A Series Circuits
Week 6	Simple DC Circuits: A Parallel Circuits
Week 7	Kirchhoff's voltage Laws
Week 8	Mid-term Exam
Week 9	Kirchhoff's current Laws
Week 10	Thevenin's Theorem
Week 11	Norton theorem
Week 12	Superposition Theorem
Week 13	Maximum Power Transfer
Week 14	First-Order Transient Responses
Week 15	Second-Order Transient Responses

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

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

	F – Fail	راس ب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	MATHEMATICS		Module Delivery		
Module Type	BASIC		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	HTCMT 100				
ECTS Credits	6				
SWL (hr/sem)	200				
Module Level		One	Semester of Delivery		one
Administering Department		Type Dept. Code	College	HTC	
Module Leader	Dr. Saleh Eesaa Jasim		e-mail	drzaki_hwj@ntu.edu.iq	
Module Leader's Acad. Title		Lecture	Module Leader's Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		20/10/2024	Version Number		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. This course provides important skill-building in basic computational skills. 2. The language of mathematics. 3. Problem-solving required for pre-college level math courses. 4. Applying principles of functions and their graphs. 5. Applying principles of limits and continuity. 6. Applying principles of differentiation and applications of derivatives.

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Solve problems of functions and their graphs 2. Solve problems of limits and continuity 3. Solve problems of applications of limits and continuity 4. Solve problems of differentiation 5. Solve problems of applications of derivatives 6. An ability to distinguish, identify, define, formulate 7. Solve engineering problems by applying engineering, science and mathematics principles.
indicative Contents المحتويات الإرشادية	

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

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/Sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	7
Unstructured SWL (h/Sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6.5
Total SWL (h/Sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 3,8,9,10
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10

Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Functions and their Graphs: -Functions; Domain and Range, Graphs of Functions, Trigonometric Functions
Week 2	Piecewise-Defined Functions, Even and Odd Functions, Common Functions, Inverse Functions, Laws of Exponents, The General Exponential Function a^x
Week 3	Graphs of: -, Exponential Functions, Natural Logarithms, Inverse Trigonometric Functions, Hyperbolic Functions
Week 4	Limits and Continuity: -Rates of Change and Tangents to Curves, Limit Laws, The Sandwich Theorem,
Week 5	One-Sided Limits, Continuity, Limits Involving Infinity; Asymptotes of Graphs.
Week 6	Differentiation: -Tangents and the Derivative at a Point, The Derivative as a Function, One-Sided Derivatives, Differentiability and Continuity on an Interval,
Week 7	Differentiation Rules, Second- and Higher-Order Derivatives, Derivatives of Trigonometric Functions,
Week 8	Indeterminate Forms and L'Hôpital's Rule, The Chain Rule, Implicit Differentiation, Linearization and Differentials.
Week 9	Midterm Exam.

Week 10	Functions and Their Derivatives, Logarithmic Differentiation, The Derivative of Exponential Functions.
Week 11	Applications of Derivatives: -Extreme Values of Functions, The Mean Value Theorem,
Week 12	Graphical Behavior of Functions from Derivatives, Examples from Mathematics and Physics.
Week 13	Integration: -Area and Estimating with Finite Sums, The Definite Integral, Integrable and Nonintegrable Functions, Properties of Definite Integrals.
Week 14	Examples
Week 15	Review, Practice
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thomas' Calculus 11 ed. 2004	Yes
Recommended Texts	Calculus 9ed Anton	Yes
Websites	MATH 1210 - Slope of a Line - University of Utah	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks with decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Mechanics-Static I		Module Delivery		
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	HTCMT 101				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UGI			Semester of Delivery
Administering Department		MT	College	HTC	
Module Leader	Ahmed Mohammed Abbas		e-mail	ahmedabas@hwj_ntu.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		01/06/2023	Version Number		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aims of the module are to 1. Recognize various types of Forces, their components, and the function of each type. 2. Identify the types of moments and the methods used to calculate the magnitude of moments. 3. Distinguish between different types of frictional forces. 4. Familiarity with the position of equilibrium and the equations used to find the position of equilibrium. 5. Identify the methods used to find the center of geometric shapes
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of the course, students should be able to: 1. an ability to identify, evaluate and solve engineering problems utilizing the acquired principal knowledge of engineering, science, and mathematics. 2. an ability to design an integrated system and its various components and processes to produce solutions that fulfill the need of society. 3. an ability to communicate effectively using oral, written, and graphic forms with different levels of audiences. solve systems

	4.an ability to acquire new engineering knowledge and skills in the mechatronics engineering fields. 5.an ability to function on multi-disciplinary teams to analyze, solve problems, and deadline commits.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Unit – I: Introduction - Basic concepts of force calculations, component analysis, and resultant calculation for the main and inclined axes [15 hrs] UNIT- II: Applications of moments in engineering works and methods of solving problems subject to moments of forces [15 hrs] UNIT- III: An introduction to couple moment and its practical uses and methods of solving problems related to couple moments [15 hrs] UNIT – IV: An introduction to the balance of forces and its engineering applications and the method of using equilibrium equations to solve problems related to the topic. [15 hrs] UNIT – V: Surface friction and methods of finding the internal forces of friction for flat and inclined surfaces [15 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

The main strategy that will be adopted in delivering this module is to encourage students' participation in the discussions, while at the same time refining and expanding their critical thinking skills.

This will be achieved through;

1- Lectures - aims to introduce the basic concepts and knowledge regarding forces analysis and the application of its methods to purely mathematical examples.

2- Tutorials - These are posted to illustrate the application of basic knowledge of equilibrium theory used to solve various practical engineering problems.

3- Assignments - are arranged to provide the opportunity for students to search for information, analyze problems and discrete data, model their equations, with knowledge obtained, and present the completed tasks.

4-Computer courses - to develop actual computer codes to solve real problems, therefore the use of computer programs for force analysis and component calculation is an important part of the subject.

Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/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	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Concepts for the Analysis method in engineering mechanic
Week 2	Forces system
Week 3	Resultant for forces
Week 4	Introduction for moment
Week 5	Moment of forces
Week 6	Couple moment
Week 7	Mid-term Exam
Week 8	Interpolation - Equilibrium of forces
Week 9	Equilibrium of forces
Week 10	Interpolation –Friction
Week 11	Friction of forces
Week 12	Friction of forces
Week 13	Interpolation – of centroid
Week 14	Centroid of area
Week 15	Centroid of area
Week 16	Preparatory week before the final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Engineering Mechanics, STATICS, Bedford A. and Fowler W., PEARSON, Prentice Hall, 5th Edition, 2008. 3. Vector Mechanics for Engineers, STATICS, Beer F. P. , Johnston E. R., Mazurek D. F.,	Yes
Recommended Texts	Vector Mechanics for Engineers, STATICS, Beer F. P. , Johnston E. R., Mazurek D. F., Cornwell P. J. and Eisenberg E. R., McGraw-Hill, 9th Edition, 2010.	No
Websites	https://www.coursera.org/learn/engineering-mechanic	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note: Marks with decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	الورش والمعامل		Module Delivery	
Module Type	BASIC		☐ Theory Lecture ☐ ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	HTCMT 105			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level		1		
Administering Department		Type Dept. Code	College	HTC
Module Leader	Dr. Saleh Eesaa Jasim		e-mail	drzaki_hwj@ntu.edu.iq
Module Leader's Acad. Title		Lecture	Module Leader's Qualification	
			Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name		Name	e-mail	E-mail
Scientific Committee Approval Date		/02/202520	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى		
لا يوجد	الفصل الدراسي	المتطلبات المسبقة
لا يوجد	الفصل الدراسي	المتطلبات المشتركة

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
1- تعليم الطلبة المبادئ الأساسية في هندسة الانتاج واستخدام ادوات الورش 2- تعليم الطلبة اسس السلامة العامة في الورش والمعامل وخطوط الانتاج 3- تعليم الطلبة الاسس الصحيحة في اختيار المواد واستخدامها 4- العمل على اكتساب الطلبة المهارات اليدوية في استخدام ادوات القياس المختلفة.. الخ 5- حث الطلبة على العمل الجماعي في حل المشكلات الهندسية في مراحل الانتاج والتعاون المطلوب	Module Aims أهداف المادة الدراسية (الورش و المعامل)
1- فهم عميق للمبادئ الأساسية للميكاترونكس من خلال التطبيق العملي. 2- مهارات قوية في تصميم وبناء وتشغيل أنظمة الميكاترونكس. 3- مهارة في استخدام المعدات والأدوات الشائعة في مجال الميكاترونكس. 4- القدرة على العمل بشكل فعال في الفرق وحل المشكلات بشكل تعاوني.	Module Learning Outcomes مخرجات التعلم للمادة الدراسية

المحتوى النظري: 1. مقدمة في هندسة الميكاترونكس 2. مبادئ الأنظمة الميكانيكية والكهربائية والإلكترونية 3. أجهزة الاستشعار والمحركات والمحركات 4. معالجة الإشارات والأنظمة المضمنة 5. التحكم الآلي المحتوى العملي: 1. بناء أنظمة ميكاترونية بسيطة 2. تشغيل التجارب على الأنظمة الميكاترونية 3. استخدام وحدات التحكم الدقيقة وأجهزة الاستشعار والمحركات 4. برمجة وحدات تحكم مضمنة للتحكم في الأنظمة الميكاترونية 5. تصميم وتصنيع مكونات الميكاترونكس باستخدام معدات التصنيع	Indicative Contents المحتويات الإرشادية
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استراتيجيات التعلم والتعليم لمادة الورش والمعامل: 1- التعلم القائم على المشاريع: يقسم الطلاب إلى مجموعات ويكلفون بإنشاء مشروع عملي يتعلق بمفهوم الورشة أو المعمل. يشجع هذا النهج الطلاب على تطبيق معرفتهم النظرية في بيئة عملية، ويساعدهم على تطوير مهارات حل المشكلات. 2- التعلم القائم على الاستفسار:
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بدلاً من تقديم المعلومات بشكل مباشر، يوجه المعلمون الطلاب إلى اكتشاف المفاهيم بأنفسهم من خلال طرح الأسئلة وتشجيع المناقشة.

يساعد هذا النهج الطلاب على تطوير مهارات التفكير النقدي والتحليل.

3- التعلم القائم على التجربة:

تتيح الورش والمعامل للطلاب فرصة المشاركة في تجارب عملية.

تعزز هذه التجارب فهم الطلاب للمفاهيم وتساعدهم على الاحتفاظ بالمعلومات بشكل أفضل.

4- التعلم التعاوني:

يتم تقسيم الطلاب إلى مجموعات صغيرة للعمل معاً على المهام.

يتضمن هذا النهج التعاون والمساءلة المتبادلة، ويساعد الطلاب على تطوير مهارات الاتصال والعمل الجماعي.

5- التعلم المختلط:

يجمع هذا النهج بين التعلم عبر الإنترنت والتدريس وجهاً لوجه.

يمكن للطلاب الوصول إلى مواد التعلم عبر الإنترنت خارج الفصل الدراسي، بينما يركز التدريس وجهاً لوجه على الأنشطة العملية والمناقشات.

6- التعلم القائم على التكنولوجيا:

يمكن استخدام التكنولوجيا لتعزيز التعلم في الورش والمعامل.

يمكن للطلاب استخدام أجهزة المحاكاة أو برامج التصميم بمساعدة الكمبيوتر أو أدوات الواقع الافتراضي لتجربة المفاهيم بطرق جديدة.

7- التقييم المستمر:

يركز التقييم المستمر على توفير ملاحظات منتظمة للطلاب حول تقدمهم.

يمكن استخدام الاختبارات القصيرة أو المهام العملية أو المشاريع لتقييم فهم الطلاب وتحديد مجالات التحسين.

8- بيئة التعلم المرنة:

يجب تصميم بيئة التعلم لتكون مرنة وداعمة.

يجب أن يكون الطلاب قادرين على الوصول إلى الموارد والمساحة اللازمة للتعلم الفعال.

Student Workload (SWL)			
الحمل الدراسي للطالب			
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	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

Material Covered

السلامة العامة ومفهوم السلامة المهنية داخل ورش الانتاج	Week 1
ادوات القياس (اهمية ادوات القياس وكيفية استخدامها)	Week 2
ادوات القياس (تطبيقات)	Week 3
الادوات اليدوية (عمليات الانتاج اليدوية)	Week 4
ورشة البرادة وضبط الابعاد	Week 5
ورشة النجارة	Week 6
ورشة الخراطة عمليات تشكيل المعادن	Week 7
ورشة السباكة عمليات السباكة	Week 8
ورشة اللحام عمليات اللحام ووصل المعادن	Week 9
Midterm Exam	Week 10
قوانين السلامة الكهربائية في الورشة الكهربائية ,التعرف على انواع القياسات الكهربائية و كيفية استخدام اجهزة القياس	Week 11
انواع الدوائر الكهربائية :سلسلة، توازي، مختلطة:التعرف وحدات التحكم والحماية في الدوائر الكهربائية	Week 12
أنواع المحركات الكهربائية، مبادئ عملها، التحكم في سرعة المحركات:استخدام الكونداكترات والتايمرات في الدوائر الكهربائية	Week 13
مخاطر التيار المتسرب، طرق الوقاية.اللحام بالصولدر واستبدال القطع المختلفة	Week 14
تعريف المقاومة، أنواع المقاومات، قانون أوم، قياس المقاومة. قراءة قيمة المقاومات وحساب المقاومة المتغيرة باستخدام التيار والجهد الكهربائي	Week 15
Final Exam	Week 16

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Thomas' Calculus 11 ed. 2004	Yes
Recommended Texts	Calculus 9ed Anton	Yes
Websites	MATH 1210 - Slope of a Line - University of Utah	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Engineering Mechanics-Dynamics		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	HTCMT 101			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UGI	Semester of Delivery		C22
Administering Department	MT	College	HTC	
Module Leader	Ahmed Mohammed Abbas		e-mail	ahmedabas@hwj_ntu.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)	e-mail	E-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	01/06/2024	Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aims of the module are to 1. learn fundamental concepts and principles of particle and rigid body motion kinematics 2. Resolve the motion of single particles in multiple coordinate systems 3. Obtain an understanding of Newton's Laws of Motion. 4. Apply analytical techniques to the solution of important engineering dynamics problems. 5. Apply the basic concepts of force, mass and acceleration; of work energy; and of impulse and momentum for particles and rigid bodies 6. Obtain an understanding of mass moment of inertia. 7. Obtain basic knowledge on mechanical vibration. 8. Obtain the equation of motion for single degree of freedom systems 9. Control unwanted vibration so that its adverse effects are kept within limits

Module Learning Outcomes مخرجات التعلم للمادة الدراسية	On completion of the course students should be able to: 1. Understand the basic kinematics concepts: displacement, velocity, and acceleration (and their angular counterparts). 2. Define basic kinematic quantities of rectilinear and curvilinear motion of particle such as: position, displacement, velocity and acceleration. 3. Understand how objects move and interact with one another. 4. Understand and apply Newton's laws of motion. 5. Understand and be able to apply work and kinetic energy, gravitational and elastic potential energy. 6. Understand and be able to apply impulse and momentum. 7. Apply appropriate mathematical techniques to translational motion and rotational motion for rigid bodies. 8. Determines how much torque an object needs to reach a specific angular acceleration. 9. Understand mechanical vibration and be familiar with basic terminology associated with it. 10. Model and analyze one degree of freedom mass-spring-damper systems. 11. Apply the theory of classically damped vibrating systems to problems of one degree of freedom.
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Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - kinematics of particle Introduction: definition, fundamental units, International System of Units, Newton's laws of motion and law of gravitation. Rectilinear motion and basic kinematic quantities: position, displacement, velocity and acceleration. Special cases of rectilinear motion of particle: motion with constant velocity and motion with constant acceleration. Dependent rectilinear motions. Curvilinear motion of particle: position vector, velocity and acceleration. Free flight of a projectile. Tangential and normal components of velocity and acceleration. Cylindrical (r-θ) coordinates components of velocity and acceleration. Relative motion. [25 hrs]. Part B - kinetics of particle Force and acceleration. Newton's second law, Definition of work, kinetic energy and power. Work of a gravitational force. Work of a spring force. Principle of work and energy. Potential energy: gravitational and elastic. Principle of impulse and momentum. Angular impulse and angular momentum. [15 hrs] Part C - kinematics of Rigid body
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	Plane kinematics of rigid bodies. Types of plane motion of rigid bodies: translation, rotation, general plane motion. Relative Velocity and acceleration. Mass moment of inertia. [15 hrs] Part D – Mechanical vibration Introduction to vibration: types, mass, spring, damper. Free undamped vibration, vibration isolation. [10 hrs] Free damped vibration, Forced damped vibration. [10 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 discussions, while at the same time refining and expanding their critical thinking skills. This will be achieved through; 1- Lectures - aim to deliver fundamental knowledge in relation to dynamic analysis and the application to practical examples. 2- Tutorial sessions - are deployed to illustrate the application of fundamental

	knowledge of dynamic analysis to different practical exercises. 3- Assignments - are arranged to provide the opportunity for students to search for information, analyze machines with knowledge obtained, and present the completed tasks.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module تقييم Evaluation المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative	Quizzes	2	10% (10)	4, 8	LO #1, 2, 10 and

assessment					4
	Assignments	2	10% (10)	3, 13	LO # 1,2, 3, and 5
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 3, 4 and 5
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-4
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction: definition, fundamental units, international system of units. Rectilinear motion and basic kinematic quantities: position, displacement, velocity and acceleration.
Week 2	Kinematics: Curvilinear motion of particle: position vector, velocity and acceleration. Free flight of a projectile
Week 3	Tangential and normal components of velocity and acceleration (n-t).
Week 4	Cylindrical (r- θ) coordinates components of velocity and acceleration.
Week 5	Relative motion
Week 6	Kinetics: direct application of Newton's second law (force, mass, acceleration)

Week 7	Work and Energy: Definition of work, kinetic energy and power. Work of a gravitational force. Work of a spring force. Principle of work and energy. Potential energy: gravitational and elastic
Week 8	Impulse and momentum: Principle of impulse and momentum. Angular impulse and angular momentum.
Week 9	Rigid body motion: Plane kinematics of rigid bodies. Types of plane motion of rigid bodies: translation, rotation, general plane motion.
Week 10	Relative Velocity
Week 11	Relative acceleration. Mass moment of inertia.
Week 12	Introduction to vibration: types, mass, spring, damper.
Week 13	Free un-damped vibration, vibration isolation
Week 14	Free damped vibration
Week 15	Forced damped vibration
Week 16	Preparatory week before the final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Engineering Mechanics: Dynamics 5th edition by Meriam, J. L., Kraige, L. G. (2003)	Yes
Recommended Texts	Engineering Mechanics "Dynamics" R. C. Hibbeler, 2016	No
Websites	https://www.classcentral.com/classroom/youtube-engineering-mechanics-dynamics-54539	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	AC Electrical Circuits		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	HTCMT 107			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level		First	Semester of Delivery	two
Administering Department		Mech. Eng. Tech.	College	HTC
Module Leader	Zaki M. Abdullah		e-mail	drzaki_hwj@ntu.edu.iq
Module Leader's Acad. Title		Assistant Professor	Module Leader's Qualification Ph.D.	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name		Zaki M. Abdullah		drzaki_hwj@ntu.edu.iq
Scientific Committee Approval Date		01/03/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This module aims to: 1. Provide a fundamental understanding of alternating current (AC) principles, waveforms, and their characteristics. 2. Develop the ability to analyze and solve AC circuit problems involving resistors, inductors, and capacitors in series, parallel, and combination circuits. 3. Introduce the concept of impedance, reactance, and phasor analysis for better comprehension of AC circuit behavior. 4. Equip learners with knowledge of power calculations in AC circuits, including real, reactive, and apparent

	power, as well as power factor correction. 5. Enhance problem-solving skills by applying network theorems (such as Thevenin's and Norton's theorems) to AC circuit analysis. 6. Explore the practical applications of AC circuits in electrical power systems, transformers, motors, and generators. 7. Prepare students for advanced studies and practical applications in electrical engineering, automation, and power electronics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	With the successful completion of this Module, students will be able to: 11.Explain the principles of alternating current (AC) and differentiate it from direct current (DC). 12.Describe sinusoidal waveforms, including amplitude, frequency, phase, and RMS values. 13.Calculate inductive and capacitive reactance and understand their impact on circuit 14.Determine impedance (Z) and phase angles in AC circuits. 15.Use Ohm's Law, Kirchhoff's Laws, and phasor diagrams to analyze AC circuits. 16.Apply Thevenin's and Norton's theorems in AC circuit analysis. 17.Solve AC circuit problems using complex numbers and phasor representation.

	18. Calculate real, reactive, and apparent power in AC circuits. 19. Analyze the behavior of AC circuits in series, parallel, and combination configurations. 20. Predict resonance conditions in RLC circuits and calculate resonance frequency. 21. Study the type of the filters.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following topics: 1. Fundamentals of Alternating Current (AC): [10 hrs] • Definition and characteristics of AC vs. DC • Sinusoidal waveforms: frequency, period, amplitude, and phase • Mathematical representation of AC signals (sine and cosine functions) • RMS, peak, and average values of AC signals 2. AC Circuit Components [10] • Behavior of resistors, inductors, and capacitors in AC circuits • Inductive reactance (X_L) and capacitive reactance (X_C) • Impedance (Z) and phase relationships • Phasor representation of AC quantities 3. Analysis of AC Circuits [20 hrs] • Ohm's Law and Kirchhoff's Laws in AC circuits • Series and parallel AC circuits • Power in AC circuits: real, reactive, and apparent power

- Power factor and its correction techniques

4. AC Circuit Theorems and Network Analysis [20hrs]

- Thevenin's and Norton's Theorems applied to AC circuits
- Superposition Theorem
- Maximum Power Transfer Theorem
- Resonance in RLC circuits (series and parallel resonance)

5. Transformers and Power Distribution [15]

- Principles of AC transformers
- Efficiency and losses in transformers
- Single-phase vs. three-phase AC power systems
- Power transmission and distribution concepts

6. Practical Considerations and Safety [60 hrs]

- Measuring AC voltage, current, and power using instruments
- Electrical safety standards in AC systems
- Common faults and troubleshooting techniques in AC circuits

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The strategies needed in this subject are concentrated on enhancing the students thinking horizons so that they get familiar with it and can feel able to manipulate its problems details. This can be achieved by using real life examples, videos, and schemes with many problems to be solved. Also, the student is requested to solve a lot of problems. When this is accompanied by good utilization of the laboratory, students will be able to go through the course successfully.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/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	97	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.4
Total SWL (h/Sem) الحمل الدراسي الكلي للطالب خلال الفصل	170		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to AC Circuits • Difference between AC and DC • Sinusoidal waveforms: amplitude, frequency, period, phase • RMS value and average value of AC signals • Introduction to phasors
Week 2	Phasors and Complex Numbers • Representation of AC quantities using phasors • Complex numbers: rectangular and polar forms • Arithmetic operations with complex numbers • Impedance and admittance concepts
Week 3	Passive Components in AC Circuits • Behavior of resistors, capacitors, and inductors in AC circuits • Reactance (inductive and capacitive) • Impedance of R, L, and C components
Week 4	Series AC Circuits • Analysis of RLC series circuits • Impedance triangle and phase relationships • Voltage and current relationships in series circuits
Week 5	Parallel AC Circuits

	• Analysis of RLC parallel circuits • Admittance triangle and phase relationships • Current and voltage relationships in parallel circuits
Week 6	Network Theorems in AC Circuits • Thevenin's and Norton's theorems for AC circuits
Week 7	Network Theorems in AC Circuits • Superposition theorem • Maximum power transfer theorem
Week 8	Resonance in AC Circuits • Series resonance • Resonant frequency, bandwidth, and quality factor (Q) • Applications of resonant circuits
Week 9	Resonance in AC Circuits • parallel resonance • Resonant frequency, bandwidth, and quality factor (Q) • Applications of resonant circuits •
Week 10	Power in AC Circuits • Instantaneous power, average power, and power factor • Real, reactive, and apparent power • Power triangle and power factor correction •

Week 11	Mutual Inductance and Transformers • Mutual inductance and coupling coefficient • Ideal and real transformers • Transformer equivalent circuits and applications
Week 12	Three-Phase Systems • Introduction to three-phase AC systems • Star (Y) and delta (Δ) configurations • Line and phase voltages/currents in balanced systems •
Week 13	Unbalanced Three-Phase Circuits • Analysis of unbalanced three-phase systems • Neutral currents in unbalanced systems Applications and challenges of unbalanced systems
Week 14	Filters and Frequency Response • Low-pass, high-pass, band-pass, and band-stop filters • Applications of filters in AC circuits
Week 15	Transient Analysis in AC Circuits • Transient response of RLC circuits • Time constants and damping in AC circuits • Applications of transient analysis •
Week 16	• Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to function generators and oscilloscopes; measuring AC waveforms.
Week 2	Phasor analysis of simple AC circuits.
Week 3	Measuring impedance of R, L, and C components.
Week 4	Building and analyzing RLC series circuits.
Week 5	Building and analyzing RLC parallel circuits.
Week 6	Applying network theorems to AC circuits.
Week 7	Applying network theorems to AC circuits.
Week 8	Analyzing resonant circuits and measuring bandwidth in series circuits
Week 9	Analyzing resonant circuits and measuring bandwidth in parallel circuits
Week 10	Measuring power in AC circuits; power factor correction.
Week 11	Testing transformers and measuring turns ratio.
Week 12	Building and analyzing three-phase circuits.
Week 13	Analyzing unbalanced three-phase circuits.
Week 14	Designing and testing basic filters.
Week 15	Observing transient responses in AC circuits.

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

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	حقوق الانسان والديمقراطية		Module Delivery
Module Type	S		☒ Theory ☐ Lecture ☐ Lab Tutorial ☐ Practical ☐ Seminar
Module Code	NTU 100		
ECTS Credits	2		
SWL (hr/sem)			
Module Level	1	Semester of Delivery	1
Administering Department	تقنيات الميكاترونكس	College	الكلية التقنية الحويجة
Module Leader	صاحب جلال عجاج	e-mail	Drsahib_hwj@ntu.edu.iq
Module Leader's Acad.	أستاذ مساعد	Module Leader's	دكتوراه

Title			Qualification		
Module			e-mail		
Tutor					
Peer Reviewer Name			e-mail		
Scientific Committee			Version		
ApprovalDate			Number		

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

Module Aims, Learning Outcomes and Indicative Contents

اهداف المادة الدراسية ونتائج التعلم والمحتوى الارشادي

Module Aims اهداف المادة الدراسية	معرفة مفهومي الديمقراطية وحقوق الانسان 2 - التمييز بين هذا المفهوم والمفاهيم الأخرى 3 - الفهم الصحيح لحقوق الانسان استنادا للمبادئ الإسلامية 4 - معرفة الحريات العامة وكيفية الحفاظ عليها
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- يعرف الطالب مبادئ حقوق الإنسان بمعناها الصحيح المستمد الى المفاهيم الإسلامية، ويدرك الفرق بين معناها في الإسلام ومعناها عند الديانات الأخرى. 2- ان يكون الطالب قادرا على تصنيف أنواع الحقوق والحريات والديمقراطيات بأنواعها 3- ان يكون قادرا بان يشارك في حماية هذه الثقافة ونشرها في المجتمع فضلا عن التزامه 4- ويتمكن الطالب من الدفاع عن حقوقه وحقوق الآخرين من خلال معرفته بالمنظمات التي تحمي حقوق الانسان 5 - معرفته بداية ظهور حقوق الانسان وكيف تطورت عبر الزمن والاسس التي أسست عليها من خلال الأديان السماوية وجود أساسها في الدين الإسلامي والنظريات التي كتبتها المجتمعات التي كانت بحاجة الى هذه الحريات 6- قادر على معرفة المنظمات التي تعنى بحقوق الانسان والديمقراطية مثل منظمة العفو الدولية ومنظمة الصليب الأحمر وغيرها 7 - قادرا على معرفة العلاقة بين حقوق الانسان والحريات العامة 8 - قادرا على معرفة المواثيق والعهود الدولية كميثاق الإعلان العالمي لحقوق الانسان 9 - معرفة الضمانات لهذه الحقوق في الدساتير العالمية

1 – تنمية قدرة الطلبة على التمييز بين ممارسة الحقوق والالتزام بالقوانين المعمول بها .

2 – زيادة الوعي الثقافي للحقوق والحريات العامة ونشره في المجتمع .

3 – زيادة الوعي بالمفهوم الديمقراطي وكيفية ممارسته من خلال الانتخابات

Indicative Contents

المحتويات الارشادية

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1 - شرح المعلومات كاملة بطريقة مفصلة ومفهومة 2 - التواصل المستمر مع الطلبة وخلق بيئة ملائمة للتعلم 3 - التأكد من وصول المعلومات بصورة صحيحة من خلال الاختبارات وأيضا من خلال الأسئلة المباشرة 4 - تفعيل مبدأ التعليم التعاوني لتبادل الآراء بين الطلبة وفهمهم لأفكار بعضهم
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Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل		Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب اسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل		Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب اسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

		Time/ Nu mber	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment التقييم التكويني	Quizzes الاختبارات	2	5% (5)	2, 7	يعرف الطالب مبادئ حقوق الإنسان بمفهوم إسلامي
	Assignments المهام	2	5% (5)	5, 13	يعدد الطالب أنواع الحقوق والحريات والديمقراطيات بأنواعها
	Projects/ lab المشاريع / المختبر	2	5% (5)	7, 13	يمكن للطالب ان يشارك في حماية هذه الثقافة ونشرها في المجتمع
	Report التقرير	2	5% (5)	2	تجربة عملية يقدمها الطالب بتقرير في الدفاع عن حقوقه وحقوق الآخرين من خلال المنظمات التي تحمي حقوق الانسان
Summative assessment التقييم التلخيصي	Midterm Exam الامتحان الفصلي	1hr	20% (20)	4, 11	اختبار في الاسس التي أسست عليها الحقوق من خلال الأديان السماوية ووجود أساسها في الدين الإسلامي
	Final Exam	3hr	60% (60)	16	اختبار في كل ما تم التطرق

	الامتحان النهائي			لة في المحاضرات او تم مناقشته او تم كتابة التقرير عنه بصورة عامة
التقييم الاجمالي Total assessment		100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الأسبوعي النظري	
Material Covered	
حقوق الانسان وتطورها في التاريخ البشري	الاسبوع الأول والثاني
حقوق الانسان في العصور القديمة والوسيلة	الأسبوع الثالث والرابع والخامس
المطلب الاول: حقوق الانسان في الحضارات القديمة مع التركيز على حضارة وادي الرافدين . المطلب الثاني: حقوق الانسان في الشرائع السماوية مع التركيز على حقوق الانسان في الاسلام.	
المطلب الثالث: حقوق الانسان في العصور الوسطى: أ.حقوق الانسان في المذاهب والمدارس والنظريات السياسية.	
ب.حقوق الانسان في الشركات الحقوق واعلاناتها والثورات والدساتير (الوثائق الإنكليزية، الثورة الامريكية، الثورة الفرنسية، الثورة الروسية)	
حقوق الانسان في التاريخ الحديث والمعاصر.	الأسبوع السادس والسابع والثامن
المطلب الاول: الاعتراف الدولي بحقوق الانسان منذ الحرب العالمية الاولى (عصبة الامم، الامم المتحدة)	
المطلب الثاني : الاعتراف الاقليمي بحقوق الانسان :	
1- الاتفاقية الاوربية لحقوق الانسان 1950	
2- الاتفاقية الامريكية لحقوق الانسان 1969	
3- الميثاق الافريقي لحقوق الانسان 1981	

4- الميثاق العربي لحقوق الانسان 1994 المطلب الثالث : المنظمات غير الحكومية وحقوق الانسان (اللجنة الدولية للصليب الاحمر ، منظمة العفو الدولية ،منظمة مراقبة حقوق الانسان، المنظمة العربية لحقوق الانسان ، المنظمات الوطنية، لحقوق الانسان المطلب الرابع : حقوق الانسان في الدساتير العراقية بين النظرية والواقع .	
حقوق الانسان (التحديد والتعريف والضمانات). العلاقة بين حقوق الانسان والحريات العامة . المطلب (أ) : في الاعلان العالمي لحقوق الانسان والمواثيق الدولية . المطلب (ب) : في المواثيق الاقليمية والدساتير الوطنية . المبحث الثاني : اشكال واصناف حقوق الانسان والترابط بينها . المطلب (أ) : حقوق الانسان الفردية وحقوق الانسان الجماعية . المطلب (ب) : حقوق الانسان الاقتصادية والاجتماعية والثقافية وحقوق الانسان المدنية والسياسية . المطلب (ج) : حقوق الانسان الحديثة : الحق في التنمية, الحق في البيئة النظيفة الحق في التضامن ,الحق في الاسلام ...الخ) المطلب (د) : الترابط بين حقوق الانسان كل لا يتجزأ . المبحث الثالث : ضمانات احترام وحماية حقوق الانسان المطلب الاول : ضمانات احترام وحماية حقوق الانسان على الصعيد الوطني أ – الضمانات في الدستور والقوانين ب – الضمانات في مبدأ سيادة القانون	الأسبوع التاسع والعاشر والحادي عشر
تصنيف الحريات العامة : 1- الحريات الاساسية او الحريات فردية .	الأسبوع الثاني عشر والثالث عشر
2 – الحريات الأساسية او الحريات الفردية	الأسبوع الرابع عشر والخامس عشر

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

	Material Covered

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	متوفرة في مجانية التعليم مكتبة الكلية شبكة الانترنت	Yes
Recommended Texts		
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	English Language		Module Delivery	
Module Type	B		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	NTU 101			
ECTS Credits	2			
SWL (hr/sem)	100			
Module Level	1	Semester of Delivery		1
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Amer Ahmed Abed		e-mail	ameraldery@ntu.edu.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	M.Sc.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Name		e-mail	E-mail
Scientific Committee Approval	01/06/2023		Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The aims of the module are to: 1- Foster the development of problem-solving skills, with a particular emphasis on speaking, reading, writing, and listening, while also gaining a comprehensive understanding of the English language as a foreign language through the utilization of various techniques. 2- Comprehend the fundamental principles of the English language. 3- Explore the foundational concepts essential for learning the key principles of English grammar and expanding English vocabulary. 4- Establish a solid foundation for proficient English writing and speaking. 5- Gain a comprehensive understanding of constructing

	grammatically accurate English sentences.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completing the course, students will be able to: 1- Demonstrate proficiency in utilizing main and auxiliary verbs, as well as possessive pronouns. 2- Compile a comprehensive list of words associated with questions and various subject pronouns. 3- Engage in conversations concerning social expressions and personal information, particularly regarding jobs, using affirmative, negative, and interrogative sentences. 4- Discuss the usage of adjectives and their placement within sentences. 5- Construct simple present sentences using "I," "we," "you," and "they," and accurately define the usage of articles. 6- Describe the present simple tense utilizing "he" and "she," and explore adverbs of frequency. 7- Identify basic question words and demonstrative pronouns, and effectively apply them in different contexts. 8- Examine the usage of "there is/are" and various prepositions. 9- Analyze the structure of simple past sentences and irregular verbs. 10- Explain the negative and interrogative structures of simple past tense sentences, along with adverbs associated with the past tense. 11- Recognize the usage of multiple adverbs and the use of "can/can't" in sentences, while explaining requests and offers. 12- Elaborate on the usage of "like" and "would you like," as well as

	the application of "some" and "any" in various expressions. 13- Discuss the application of the present continuous tense and distinguish it from the present simple tense. 14- Explain the structures employed to refer to future plans.
Indicative Contents المحتويات الإرشادية	The indicative content of the course comprises the following: 1- Introduction to the significance of English language acquisition and its role in social communication. 2- Application and practice of various tenses, such as present and past tenses. 3- Comprehensive exploration of key concepts, including offers, requests, future, personal expressions, and different tenses. 4- Utilization of a range of skills to facilitate English language learning, including listening, reading, writing, and speaking. Additionally, providing diverse examples to enhance understanding of concepts and structures.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategies adopted in delivering this module include: ▪ Encouraging active participation and fostering critical thinking skills through engaging students in discussions. ▪ Applying the communicative approach to enhance students' English language learning skills and enable effective communication. ▪ Incorporating authentic materials in the classroom to create a

	realistic and immersive learning experience. ▪ Emphasizing student motivation and promoting their engagement in the learning process. ▪ Enhancing interaction and communication skills to achieve greater success in English language proficiency.
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Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	67	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 11	LO #1, 2, and 9, 10

	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction and Basics: Course overview, introductions, diagnostic assessment. Basic grammar review (nouns, pronouns, verbs).
Week 2	Introduction and Basics: Sentence structure basics (subject, verb, object). Practice with simple sentences related to engineering topics.
Week 3	Technical Vocabulary and Descriptions: Vocabulary building (common engineering terms, equipment, tools).
Week 4	Technical Vocabulary and Descriptions: Descriptive language (adjectives and adverbs). Writing short technical descriptions.

Week 5	Reading Comprehension and Summarization: Reading strategies (skimming, scanning). Practice with short engineering articles.
Week 6	Reading Comprehension and Summarization: Summarizing texts. Creating concise summaries of technical information.
Week 7	Mid-term Exam
Week 8	Technical Writing Basics: Writing instructions (how-to guides). Using sequence words (first, then, next).
Week 9	Technical Writing Basics: Writing short reports. Structure and language for report writing.
Week 10	Listening: Listening to technical lectures (main ideas, key points).
Week 11	Note-taking: Note-taking techniques. Practice with short audio or video clips on engineering topics.
Week 12	Presenting Information: Introduction to presentations (structure, key phrases).
Week 13	Presenting Information: Presentation practice. Students prepare and present on a chosen engineering topic.
Week 14	Final assessment (combination of vocabulary, reading, writing, and speaking tasks).
Week 15	Review key concepts from the course.
Week 16	Preparatory week before the final Exam.

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	English Grammar in Use" by Raymond Murphy	Yes
Recommended Texts	Technical English Vocabulary and Grammar" by Nick Brieger and Alison Pohl.	No
Websites		

Grading Scheme

مخطط الدرجات

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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	اللغة العربية		Module Delivery	
Module Type	B		☒ Theory ☐ Lecture ☐ Lab Tutorial ☐ Practical ☐ Seminar	
Module Code	NTU103			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level		2	Semester of Delivery	2
Administering Department		هندسة تقنيات الميكاترونيكس	College	الكلية التقنية الحويجة
Module Leader	صاحب جلال عجاج		e-mail	Drsahib_hwj@ntu.edu.iq
Module Leader's Acad. Title		أستاذ مساعد	Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee ApprovalDate			Version Number	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

اهداف المادة الدراسية ونتائج التعلم والمحتوى الإرشادي

1- تعليم الطالب المهارات اللغوية وصياغة الخطاب الإداري بطريقة واضحة وبعبارة عن الأخطاء والتأويل. تعليم الطالب على مهارة الكتابة ومعرفة الالفاظ الصحيحة والمصطلحات المهمة 2- 3- القيام بواجباته بصورة دقيقة	Module Aims اهداف المادة الدراسية
الأهداف المعرفية أ - تعليم الطالب التكلم وكتابة المخاطبات الإدارية. ب - الأهداف المهاراتية الخاصة بالمقرر تعليم الطالب على صياغة المخاطبات بطريقة احترافية مختصرة وغير مخلة بالمضمون طرائق التعليم والتعلم المحاضرات النظرية / الزيارات الميدانية/ حل الأمثلة/ حلقات نقاشية/ التدريب ((الصيفي)) طرائق التقييم الاختبارات الشفهية/ الاختبارات التحريرية/ التقارير الأسبوعية/ الحضور اليومي/ ((الامتحانات الفصلية والنهائية ج- الأهداف الوجدانية والقيمية القيام بواجباته في موقع العمل بدافع الابداع والتطوير طرائق التعليم والتعلم المحاضرات النظرية/ الزيارات الميدانية/ حل الأمثلة/ حلقات نقاشية/ التدريب ((الصيفي))	Module Learning Outcomes مخرجات التعلم للمادة الدراسية

طرائق التقييم ((الاختبارات الشفهية/ الاختبارات التحريرية/ السجل التراكمي للطلاب)) د - المهارات العامة والتأهيلية المنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي) د1- تحسين مهاراتهم الكلامية والنقاشية د2- رفع مدركاتهم البحثية ونقل الطالب من مرحلة التعليم إلى التعلم	
1- تنمية قدرة الطالب على التعرف على الأخطاء اللغوية وتجنبها، وكيفية التمييز بين المفردات والمصطلحات والمرادفات العربية 2- نشر الثقافة العربية وما تحمله هذه اللغة من أسرار عظيمة لتقدمها وتميزها بين لغات العالم أجمع، فقد فشلت اللغات في التوصل إلى مفاهيم معاني تناسب لغة الضاد. 3- بذل الجهود لمواصلة معرفة قدر كاف من هذه اللغة المختارة من خلال البحث والتحقيق	Indicative Contents المحتويات الارشادية

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

الاستراتيجية

1- اشرح المعلومات كاملة بطريقة مفصلة ومفهومة

2- التواصل المستمر مع الطلبة وخلق بيئة مناسبة للتعلم

3- التأكد من تلقي المعلومات بشكل صحيح من خلال الاختبارات وأيضاً من خلال الأسئلة المباشرة

4- تفعيل مبدأ التعليم التعاوني لتبادل الآراء بين الطلبة وتفهمهم لأفكار بعضهم البعض

Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/w)

الحمل الدراسي المنتظم للطلاب اسبوعياً

Structured SWL (h/sem)

الحمل الدراسي المنتظم للطلاب خلال الفصل

Unstructured SWL (h/w)

الحمل الدراسي غير المنتظم للطلاب
اسبوعياً

Unstructured SWL (h/sem)

الحمل الدراسي غير المنتظم للطلاب خلال الفصل

175

Total SWL (h/sem)

الحمل الدراسي الكلي للطلاب خلال الفصل

Module Evaluation					
تقييم المادة الدراسية					
		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	2, 7	
	Assignments	2	5% (5)	5, 13	
	Projects/ lab	2	5% (5)	7, 13	
	Report	2	5% (5)	2	
Summative assessment	Midterm Exam	1hr	20% (20)	4, 11	
	Final Exam	3hr	60% (60)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الأسبوعي النظري	
Material Covered	
مفهوم الأخطاء اللغوية قواعد كتابة التاء المربوطة والتاء المفتوحة الالف الممدودة والالف المقصورة الحروف الشمسية والقمرية	الاسوع الأول والثاني

الضاد والظاء كتابة الهمزة همزة الوصل والقطع الهمزة المتوسطة الهمزة المتطرفة علامات الترقيم	الأسبوع الثالث والرابع والخامس
الاسم والفعل والتفريق بينهما المفاعيل المفعول به المفعول المطلق المفعول لاجله المفعول فيه المفعول معه	1 الأسبوع السادس والسابع والثامن
العدد والمعدود تطبيقات الأخطاء اللغوية الشائعة	الأسبوع التاسع والعاشر والحادي عشر
معاني حروف الجر قاعدة الالف الفارقة قاعدة النون والتنوين الجوانب الشكلية للخطاب الإداري	الأسبوع الثاني عشر والثالث عشر
لغة الخطاب الإداري	الأسبوع الرابع عشر والخامس عشر

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

	Material Covered

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	تتوفر كافة الكتب باللغة العربية، بالإضافة إلى التعليم المجاني	نعم
Recommended Texts		
Websites		

Group	Grade	التقدير	Marks (%)	Definition

Grading Scheme

مخطط الدرجات

Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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