



**Ministry of Higher Education and Scientific
Research**

**Scientific Supervision and Evaluation
Authority**

**Quality Assurance and Academic
Accreditation Department**

**Academic Program Description
University of Hilla
College of Engineering Technologies
Department of Medical Instrumentation
Engineering Techniques**

2025-2026



University Name: University of Hilla

College / Institute: College of Engineering Technologies

Academic Department: Department of Medical Instrumentation Engineering Techniques

Academic or Professional Program Name: Bachelor of Engineering in Medical Instrumentation Engineering Techniques

Final Degree Awarded: Department of Medical Instrumentation Engineering Techniques

Study System: Bologna Process

Program Description Prepared On: 24/3/2026

File Completed On: 25/3/2026

Reviewed by Quality Assurance and University Performance Division

Name of Quality Assurance and University Performance Officer: Ali Hussein Ghalta

Date: 29/3/2026

Signature:



Approved by the Dean

Professor: **Haroun Abaul Kadhim Shahad**



1. Vision

The academic staff of the Medical Instrumentation Engineering Techniques (MIET)/ Electrical Engineering Technical College/ Middle Technical University believes that providing high-quality technical education that makes the targeted return from the education process more efficient and distinguished by developing technical capabilities, critical thinking skills, social and personal skills, and work values in an ever-changing environment in the medical healthcare system, as well as in their careers in companies of medical instrumentation dealing with different services, demonstrating general knowledge of medical devices categories and principal of operation and maintenance. Small class sizes within the MIE program foster a close working relationship between academic staff and students in an informal and nurturing atmosphere that be a technical leader and innovator in providing high-quality educational programs and services, in a highly competitive global high-tech environment

2. Program Mission

The MIET academic staff pursues a multifaceted charge at Middle Technical University. The Program seeks to provide all students with fundamental knowledge of medical instrumentation technology. as well as a deeper understanding of a selected focus area within the Medical Instruments and Techniques. The curriculum and advising have been designed to prepare graduates for their professional future, whether they choose to work as an efficient engineering staff that can cover engineering maintenance and problem solving for vital medical devices, or to pursue advanced degrees in the Medical Instrumentation Techniques Engineering. The MIET program also provides the necessary fundamental knowledge of the Medical Instruments and Techniques to support researchers developing and creating a new biomedical equipment or tool that follows the future needs of medicine and healthcare. Further, Rehabilitation of distinguished and innovative competencies scientifically, skillfully and behaviorally in the field of medical equipment technology and keeping pace with the corresponding departments in international universities by providing community services, offering the latest study programs to create an advanced academic environment

3. Program Objectives

Students who complete the MIET program will have a strong foundation in medical instrumentation, with various employment options and occupations in mind. Graduates are knowledgeable and skilled in creating, designing, testing, and maintaining medical devices and equipment. Additionally, they can pinpoint the crucial role that medical technology developments have played in developing the modern healthcare system. They can use information, the internet, and communication technologies to gather accurate and pertinent information for reports, presentations, etc., that satisfy academic criteria. They possess the ability to interact in a second language. Additionally, they possess the capacity to communicate both verbally and in writing with various audiences. Moreover, the capacity for open-minded, interactive communication with non-experts



1.Understanding of allied knowledg.

Graduates will be able to show a thorough understanding of the market's requirements for knowledge, skills, and expertise. They are also aware of how the market and technological advancement are moving.

2.Oral and Written Communication

Graduates will be able to formally communicate the medical device troubleshooting results using oral and written communication skills.

3. Technical and cognitive skills

Graduates can design circuits for medical equipment based on specific criteria and develop .applications to view or control the outcomes

4. Critical thinking and analytical skills

Graduates will be able to identify emerging problems and try to solve them with approaches based on logical and critical .thinking using modeling, designing, and forecasting

5. Appropriate research tools and techniques

Graduates will be capable of carrying out various scientific applications using fundamental research procedures. The .graduate can adapt and acquire new skills to produce the desired results

6. Communications and IT skills

Graduates can share information with the technical team to find the optimal solution. Additionally, they can use the internet, communication, and information technologies. Graduates can read and comprehend user manuals and directions for various medical equipment. They communicate with non-experts showing awareness of diverse informational levels .and different perspectives with various medical terms in English

7. Group/team leadership

Graduates will be self-motivated, cooperate effectively with other professionals in different disciplines, backgrounds, and interests to solve problems, work lucidly in confusing situations under pressure, and demonstrate knowledge of and .commitment to following safety procedures for themselves and others

8.Own professional development

Graduates can make decisions, plan, problem-solving, and stay updated professionally.



4. Program Accreditation

The program does not have any accreditation

5. External Influences

External influences on medical instrumentation refer to the various physical, technical, and human factors in the operating environment that can disrupt, alter, or degrade the accuracy, safety, and functionality of a device. Because these tools monitor and sustain life, these influences require strict risk management

6. Program Structure

Program Structure	Number of Courses	Credit Hours	Percentage%	Notes
Institutional Requirements				Core
College Requirements				Core
Department Requirements				Core
Summer Training	Second & Third			
Others				

Academic Program Objectives:

1. To provide the MIET graduates with scientific and practical skills that enable them to diagnose malfunctions resulting in medical devices.
2. To have graduate students who have the ability to familiarize themselves with the various parts of medical devices and keep abreast of the development that occurs in their technologies.
3. To give the graduate the ability to have detailed knowledge of all modern technologies in the field of medical device engineering.
4. To provide graduates with sufficient skills to make the necessary updates regarding medical devices.
5. The MITE department seeks to achieve quality standards according to the available capabilities.

A. Cognitive Objectives

- The cognitive objectives of medical instrumentation focus on the acquisition, processing, and application of knowledge necessary to design, operate, and evaluate medical devices.
- They bridge the gap between engineering and clinical practice, encompassing data interpretation, error prevention, and the understanding of physiological systems
- Ability to design and study the technical conditions and standards for installing and operating refrigeration and air conditioning systems in compliance with safety, quality, and energy ef standards.



A. Program Qualification Objectives:

1. Giving the student the scientific and applied skills enables him/her to pin down the faults of the medical instrumentation.
2. Graduation students can be well-acquainted with the various parts of medical instrumentation and technological developments.
3. Endowing the graduate with the ability to know fully and in detail the recent technologies in the field of medical instrumentation engineering.
4. Offering students the necessary skills to modernize medical instrumentation.
5. Vertically expanding to start a program for higher studies to allow the student to have an MA and PhD.
6. Following the available capabilities, the department acquires quality standards.

Teaching and Learning Methods:

Lectures, practical laboratories, scientific seminars, training courses, and specialized exhibitions in refrigeration and air conditioning systems.

Assessment Methods:

Daily quizzes, semester exams, attendance, laboratory reports, and annual evaluations.

B. Affective and Value Objectives:

1. Design, maintain, and supervise the installation of medical instrumentation systems.
2. Provide scientific and practical consultancy.

C. Personal Development Planning:

1. **Technical Skills:** Mastering calibration, troubleshooting complex imaging equipment (MRI, CT), or learning new diagnostic software.
2. **Regulatory Knowledge:** Gaining expertise in compliance, such as understanding the FDA Device Development Process.
3. **Management Skills:** Enhancing your understanding of computerized maintenance management systems (CMMS) and healthcare economics.

D. Admission Criteria:

- Graduates of the General Secondary Education – Science branch.
- Students graduating from technical and vocational institutes.
- Students graduating from industrial vocational preparatory schools.



First stage

UGI



Level 1- Semester 1**MODULE DESCRIPTION FORM****نموذج وصف المادة الدراسية**

Module Information معلومات المادة الدراسية			
Module Title	Computer Principles		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MTU1004		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGI	Semester of Delivery	1
Administering Department	MIET	College	EETC
Module Leader	Issraa H. Hashim	e-mail	esraa_haider@hilla-unc.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Issraa H. Hashim	e-mail	esraa_haider@hilla-unc.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	27/3/2026	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 Objectives أهداف المادة الدراسية	1. To understand operating system, be familiar with its types. 2. To be familiar with the desktop. 3. To be familiar and manage files and folders. 4. To be familiar with the basic concepts of hardware components of the computer. 5. To be able to use the basic functions in control panel. 6. To recognize software types. 7. To be able to understand the basic similarities and differences among (MS Office) applications. 8. To be able to use MS Word program. 9. To be able to use MS Excel program. 10. To be able to use MS PowerPoint program. 11. To be able to use MS Outlook. 12. To be familiar with search engines and the World Wide Web. 13. To be able to use Google apps. 14. To be introduced to AI tools.
Module Learning	1. Demonstrate understanding of operating systems, including their types.



Outcomes مخرجات التعلم للمادة الدراسية	2. Navigate and utilize the desktop effectively. 3. Manage files and folders proficiently. 4. Identify hardware components of a computer system. 5. Utilize the control panel efficiently. 6. Differentiate software types and their applications. 7. Effectively utilize essential applications such as MS Office. 8. Demonstrate proficiency in using the MS Word program. 9. Demonstrate proficiency in using the MS Excel program. 10. Demonstrate proficiency in using the MS PowerPoint program. 11. Utilize MS Outlook for email and scheduling purposes. 12. Navigate search engines and utilize the World Wide Web effectively. 13. Utilize Google apps for various tasks. 14. Basic Use of AI tools.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to Operating Systems: Definition, functions, and capabilities of an operating system. Types of operating systems (e.g., Windows, macOS, Linux) with examples. Differences between operating systems and software applications. Power options: computer power on/off and power settings. (3 hrs) Exploring the Desktop: Navigating the desktop environment. Using the start button and working with applications. Understanding the relationship between software and hardware, their differences, importance, and influence on each other. Introduction to software updates. Exploring the taskbar. (6 hrs) Files and Folders: Understanding the typical window and file management. Introduction to the Recycle Bin. Understanding file names and common extensions. (6 hrs) Computer Hardware: Identifying various computer types . Exploring components inside a computer, such as the microprocessor, system memory, and storage systems. Recognizing input/output devices and their interaction. (6 hrs) Familiarity with the control panel and its categories and usage. (6 hrs) Software Overview: Understanding software requirements and their implications for hardware. Introduction to different types of application software + Dealing with viruses and malwares (2 hrs) Main Screen Features: Common features found in word processing, spreadsheet, and presentation software. Understanding the ribbon, tabs, and status bar, and their specific functions in each application. (3 hrs) MS Office Basics: Definitions and key concepts in MS Office applications and Usage. (9 hrs)



Google apps and Gmail (3hrs)

Digital Citizenship: Identifying ethical issues in the digital realm, including intellectual property, copyright, and licensing. Protecting data and computers from software threats and understanding viruses. Ensuring online privacy and security. And basic understanding and usage for AI tools (3 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Incorporate a mix of theoretical study, hands-on practice, experimentation, and real-world applications to reinforce understanding and proficiency in each of the desired learning outcomes. Seek feedback, engage in discussions, and actively participate in exercises to enhance learning and address any gaps in knowledge.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ 14 اسبوعا

Structured SWL (h/sem)

الحمل الدراسي المنتظم للطالب خلال الفصل

49

Structured SWL (h/w)

الحمل الدراسي المنتظم للطالب أسبوعيا

3

Unstructured SWL (h/sem)

الحمل الدراسي غير المنتظم للطالب خلال الفصل

26

Unstructured SWL (h/w)

الحمل الدراسي غير المنتظم للطالب أسبوعيا

2

Total SWL (h/sem)

الحمل الدراسي الكلي للطالب خلال الفصل

75

Module Evaluation



تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 9	LO #1, #2, #3 and #6, #7
	Assignments	2	10% (10)	4 and 6	LO #4 ,#8, #12 and #5, #12
	Projects / Lab.	5	15% (15)	10,11,12, 13 and 14,	LO #7, #12, #13 and #8 , #12, #13 and #9, #12, #13 and #10, #12, #13 and #11, #12, #13
	Report	1	5% (5)	6	LO #12, #7, #8 and #12
Summative assessment	Midterm Exam	3hr	10% (10)	8	LO #1 - #6
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to operating system and its types, the differences between operating systems and software applications; Common operating system features.
Week 2	Looking and navigation of the desktop; start button components ; Understanding Taskbar ,Software and hardware relationship.
Week 3	Software updates+, Files and folders looking at typical window.+ Understanding files and folders+ Libraries
Week 4	understanding Recycle bin; understanding file name and common extensions. View options



	Computer hardware identifying computers
Week 5	Looking inside a computer (microprocessor, system memory, storage systems)+ recognizing input/output devices + understanding how it works together.
Week 6	Understanding control panel categories + Understanding Ease of access + Understanding User account rights
Week 7	What is software , application software + Avoiding and dealing Viruses and malwares
Week 8	Mid Term
Week 9	MS office common features and differences
Week 10	Basic concepts and Usage of MS Word + Basic concepts and Usage of MS Power Point
Week 11	Basic concepts and Usage of MS Excell + Basic concepts and Usage of MS Outlook
Week 12	Introduction to Google apps
Week 13	Digital citizenship identifying ethical issues; protecting your data or computer
Week 14	Basic understanding and usage for AI tools
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Getting to know computer hardware + turn on and shut down options +looking at the desktop + using mouse (Menu, pointing, selecting, dragging, scrolling and execution)+ using start button
Week 2	Lab 2: Create a folder (and file) , Rename, Copy, Cut, find, shortcut +Recycle bin ; using task bar
Week 3	Lab 3: looking at a typical window +control buttons + move, resize a window+ view options+ select files + file options +using taskbar.
Week 4	Lab 4: Install, open, close, and(control panel- Programs) uninstall applications(internet and other sources); Control Panel (power options), Control Panel (add a device or printer), Control Panel (



	Project)
Week 5	Lab 5: Personalization (background and color) +(User Account (create a standard account, change password , picture and name) Control Panel- Clock and region (change date, time , and region) + Ease of Access (Narrator, Magnifier, on screen keyboard)).
Week 6	Lab 6: MS Office (word, Excel, Power point, outlook) Starting each program and identify the main screen in details as title bar, main ribbons, etc.
Week 7	Lab 7: MS Word (Home Tab, Insert Tab, Layout Tab, View Tab + Watermark, Page boarder and Page color).
Week 8	Lab 8: Mid Term
Week 9	Lab 9: MS Excel (Home Tab, Insert, Page layout, Formula, Data).
Week 10	Lab 10: MS Power Point (Home Tab, Insert, Design, Transition, Animation).
Week 11	Lab 11: MS outlook (Home Tab, send and receive) + Calendar
Week 12	Lab 12: Google apps Vs MS office.
Week 13	Lab 13: Creating Gmail+ basic e-mail functions+ using google class.Using internet (Google scholar + fining courses and materials, Khan academy and finding resources).
Week 14	Lab 14: Using AI tools

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Internet and Computing Core Certification	No
Recommended		



Texts		
Websites	https://alison.com/tag/microsoft Share and Discover Knowledge on SlideShare https://support.microsoft.com/en-us/training https://support.google.com/a/users https://edu.gcfglobal.org/en/topics/googleapps/# https://edu.gcfglobal.org/en/subjects/office/# https://chat.openai.com	

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

د. هارون عبد الحاميد
الحاميد



عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 27

رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 27

اسم التدريسي: م. م اسراء حيدر هاشم

التاريخ : 2026 / 3 / 27

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Democracy and Human Rights		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MTU1006			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level		UGI	Semester of Delivery	1
Administering Department		MIET	College	EETC
Module Leader	Rasha Saheb Hadi		e-mail	rashasaheb@mtu.edu.iq
Module Leader's Acad. Title		Assistant Lecturer	Module Leader's Qualification	M.Sc
Module Tutor			e-mail	



Peer Reviewer Name	Assist. Prof. Dr. Ahmed Fadhel	e-mail	
Scientific Committee Approval Date	8/11/2023	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. التطور التاريخي لحقوق الإنسان: دراسة التطور التاريخي لفهم حقوق الإنسان من الحضارات القديمة إلى العصور الحديثة. 2. حقوق الإنسان في الشرائع السماوية: التركيز على حقوق الإنسان في الإسلام وكيف تم تضمينها في الشريعة الإسلامية. 3. اعتراف إقليمي بحقوق الإنسان: فحص اعتراف الأقاليم الأوروبي، الأمريكي، الإفريقي، الإسلامي، والعربي بحقوق الإنسان. 4. دور المنظمات غير الحكومية: دراسة دور المنظمات مثل اللجنة الدولية للصليب الأحمر ومنظمة العفو الدولية في حماية حقوق الإنسان. 5. الإطار القانوني الدولي والإقليمي: التركيز على المواثيق الدولية والإقليمية، مثل الإعلان العالمي لحقوق الإنسان. 6. تحليل حقوق الإنسان في التشريعات الوطنية: دراسة كيفية ترجمة حقوق الإنسان في التشريعات الوطنية، مع التركيز على الدستور العراقي. 7. تصنيف حقوق الإنسان وضماناتها: فهم مختلف أشكال حقوق الإنسان والضمانات الدستورية والقضائية والسياسية لحمايتها.
Module Learning Outcomes	1. القدرة على وصف وتحليل التطور التاريخي لحقوق الإنسان منذ الحضارات القديمة حتى العصور الحديثة. 2. القدرة على فحص حقوق الإنسان في حضارة وادي الرافدين وغيرها لفهم التأثير الثقافي على



مخرجات التعلم للمادة الدراسية	تطورها. 3. تفسير حقوق الإنسان في الإسلام وفهم كيف تم تضمينها في الشريعة الإسلامية. 4. القدرة على تحليل تطور حقوق الإنسان خلال العصور الوسطى والحديثة. 5. الفهم الشامل لاعتراف الأقاليم الأوروبي، الأمريكي، الإفريقي، الإسلامي، والعرب بحقوق الإنسان. 6. القدرة على تقييم دور منظمات مثل اللجنة الدولية للصليب الأحمر ومنظمة العفو الدولية في حماية حقوق الإنسان. 7. القدرة على دراسة وتحليل المواثيق الدولية والإقليمية، بما في ذلك الاعلان العالمي لحقوق الإنسان. 8. القدرة على فحص كيف تم ترجمة حقوق الإنسان في التشريعات الوطنية، مع التركيز على مثال الدستور العراقي. 9. القدرة على تصنيف حقوق الإنسان إلى أشكال فردية وجماعية، وأجيال مثل الحقوق المدنية والسياسية والاقتصادية والاجتماعية. 10. القدرة على تحليل الضمانات الدستورية والقضائية والسياسية لحقوق الإنسان على الصعيدين الوطني والدولي والإقليمي.
Indicative Contents المحتويات الإرشادية	فهم التاريخ التطوري لحقوق الإنسان (3 س) تحليل حقوق الإنسان في الحضارات القديمة (3 س) فهم حقوق الإنسان في الشرائع السماوية (3 س) تحليل حقوق الإنسان في العصور الوسطى والحديثة (3 س) فهم الاعتراف الإقليمي بحقوق الإنسان (3 س) تقدير دور المنظمات غير الحكومية (3 س) فهم الإطار القانوني لحقوق الإنسان (3 س) تحليل حقوق الإنسان في التشريعات الوطنية (3 س) فهم أشكال وأجيال حقوق الإنسان (3 س) تحليل ضمانات حقوق الإنسان (3 س)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	تشجيع الطلاب على المشاركة في مناقشات تفاعلية حول تطور حقوق الإنسان عبر التاريخ. مشروعات بحثية: توجيه الطلاب في إعداد مشروعات بحثية تستكشف تطور حقوق الإنسان في فترات تاريخية محددة. استخدام التكنولوجيا: تضمين وسائل تكنولوجية لتعزيز تفاعل الطلاب وتقديم المعلومات بشكل أكثر تفاعلية. ورش العمل والتمثيل العملي: إجراء ورش عمل تفاعلية وأنشطة تمثيل لفهم أعمق لمفاهيم حقوق الإنسان. تقديم تقييم مستمر: تقديم تقييم مستمر لفحص تقدم الطلاب وفهمهم لتطور حقوق الإنسان على مر العصور.

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2



الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 9	LO #1, 2, 3, LO # 6, 7
	Assignments	2	10% (10)	6, 13	LO # 4 and LO#9
	Seminar	1	10% (10)	12	LO# 5, 6, 7, 8
	Report	1	10% (10)	14	LO# 8, 9, 10
Summative assessment	Midterm Exam	2hr	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	
التطور التاريخي لحقوق الانسان حقوق الانسان في الحضارات القديمة (حضارة وادي الرافدين، والحضارات القديمة الأخرى)	الأسبوع الأول
حقوق الانسان في الشرائع السماوية مع التركيز على حقوق الانسان في الاسلام. حقوق الانسان في العصور الوسطى والحديثة.	الأسبوع الثاني
الاعتراف الاقليمي بحقوق الانسان على الصعيد الأوروبي الأمريكي، الأفريقي، الإسلامي، العربي	الاسبوع الثالث
المنظمات غير الحكومية ودورها في حقوق الانسان اللجنة الدولية للصليب الاحمر، منظمة العفو الدولية، منظمة مراقبة حقوق الانسان المنظمة العربية لحقوق الانسان)	الأسبوع الرابع
حقوق الانسان في المواثيق الدولية والاقليمية والتشريعات الوطنية. حقوق الانسان في المواثيق الدولية (الاعلان العالمي لحقوق الانسان العهدين الدوليين الخاصين بحقوق الانسان	الأسبوع الخامس
حقوق الانسان في المواثيق الاقليمية (الاتفاقية الأوروبية لحقوق الانسان الاتفاقية الامريكية لحقوق الانسان الميثاق الأفريقي لحقوق الانسان الميثاق العربي لحقوق الانسان	الأسبوع السادس
امتحان منتصف الفصل الدراسي	الأسبوع السابع



الأسبوع الثامن	حقوق الانسان في التشريعات الوطنية (الدستور العراقي)
الأسبوع التاسع	اشكال واجبال حقوق الانسان: اشكال حقوق الانسان الحقوق الفردية، الحقوق الجماعية احيال حقوق الانسان الجيل الاول الحقوق المدنية والسياسية)، (الجيل الثاني الحقوق الاقتصادية والاجتماعية)، (الجيل الثالث: حقوق الانسان الحديثة ، الوعي الماني والبيتي
الأسبوع العاشر	ضمانات حقوق الانسان وحمايتها على الصعيد الوطني الضمانات الدستورية والقضائية والسياسية
الاسبوع الحادي عشر	ضمانات حقوق الإنسان وحمايتها على الصعيدين الاقليمي والدولي (دور الامم المتحدة، دور المنظمات الاقليمية جريمة الإبادة الجماعية.
الاسبوع الثاني عشر	تصنيف الحريات العامة الحريات الأساسية والفردية حرية الامن والشعور بالاطمئنان حرية الذهاب والاياب، الحرية الشخصية
الأسبوع الثالث عشر	الحريات الفكرية والثقافية حرية الرأي حرية المعتقد حرية التعليم حرية الصحافة حرية التجمع حرية تشكيل الجمعيات
الأسبوع الرابع عشر	الحريات الاقتصادية والاجتماعية حرية العمل، حرية التملك حرية التجارة والصناعة
الأسبوع الخامس عشر	الاستعداد لامتحان النهائي

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• "حقوق الإنسان في العالم العربي: القضايا والتحديات"، تأليف: علي حجازي وجمال شعت. الطبعة: الطبعة الثانية، العام: 2017. - مبادئ حقوق الإنسان: المفاهيم والقضايا الحديثة"، تأليف: أحمد المجالي " - وغسان حمدان. الطبعة: الطبعة الأولى، العام: 2019.	Yes
Recommended Texts	1. "حقوق الإنسان والديمقراطية"، تأليف: مصطفى كامل محمود. الطبعة: الطبعة الأولى، العام: 2015. 2. "تاريخ حقوق الإنسان في العصور القديمة والوسطى"، تأليف: نبيل رزق. الطبعة: الطبعة الثالثة، العام: 2012. 3. "حقوق الإنسان في العراق: الواقع والتحديات"، تأليف: سعد الله عباس. الطبعة: الطبعة الأولى، العام: 2014. 4. "حقوق الإنسان في العراق: المفهوم والتطور"، تأليف: عبد الكريم	No



السامرائي. الطبعة: الطبعة الأولى، العام: 2018.
 "حقوق الإنسان في العراق: بين التحديات والآفاق"، تأليف: محمد السامرائي
 ولقاء الحربي. الطبعة: الطبعة الأولى، العام: 2020.

Websites

The Collage E-Library

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	تطبيقات الحاسوب	Module Delivery
Module Type	اساسي	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MTU1005	
ECTS Credits	3	
SWL (hr/sem)	75	
Module Level	UGII 2	
Semester of Delivery		3



Administering Department		MIET	College	Engineering Techniques
Module Leader			e-mail	Haider_Kareem@gmail.com
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name		Haider Kareem	e-mail	Haider_Kareem@gmail.com
Scientific Committee Approval Date		20/3/2026	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	تهدف هذه الوحدة إلى: 1. تقديم لمحة عامة عن برامج مايكروسوفت وورد وإكسل وباوربوينت، وتعريف الطلاب بميزاتها الرئيسية وواجهات المستخدم الخاصة بها. 2. تنمية المهارات الأساسية في إنشاء المستندات وحفظها وفتحها في برنامج مايكروسوفت وورد، بما في ذلك تنسيق النصوص والفقرات، والعمل مع الأنماط والسمات. 3. استكشاف الميزات المتقدمة في برنامج مايكروسوفت وورد، مثل خيارات تخطيط الصفحة، والعمل مع الرؤوس والتذييلات وأرقام الصفحات، وإضافة الجداول والصور والكائنات. 4. تعريف الطلاب بجداول البيانات وأوراق العمل في برنامج مايكروسوفت إكسل، وتنمية مهاراتهم في إدخال البيانات ومعالجتها، واستخدام الصيغ والدوال الأساسية. 5. التعمق في ميزات برنامج مايكروسوفت إكسل المتقدمة، بما في ذلك العمل مع النطاقات والخلايا، وفرز البيانات وتصنيفها، وإنشاء المخططات والرسوم البيانية. 6. توجيه الطلاب في إنشاء الشرائح وتعديلها في برنامج مايكروسوفت باوربوينت، وتطبيق السمات



	والقوالب، وإضافة النصوص والصور وعناصر الوسائط المتعددة. 7. استكشاف ميزات PowerPoint المتقدمة، مثل انتقالات الشرائح، والرسوم المتحركة، واستخدام SmartArt والأشكال، والاستفادة من أدوات العرض التقديمي وخيارات عرض الشرائح. 8. تعليم تقنيات معالجة النصوص في Microsoft Word، مثل دمج المراسلات، والتعاون في المستندات، وإنشاء مستندات احترافية، وإدارة المراجع والاقتباسات. 9. اكتساب مهارات متقدمة في تحليل البيانات باستخدام Microsoft Excel، بما في ذلك الصيغ والدوال المتقدمة، والتحقق من صحة البيانات، والتنسيق الشرطي، والجدول المحورية. 10. استكشاف ميزات التعاون والمشاركة في Microsoft Office، بما في ذلك مشاركة المستندات وكتابتها بشكل مشترك، واستخدام التعليقات وتتبع التغييرات، وحماية المستندات.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. إظهار فهم متين لبرامج مايكروسوفت وورد وإكسل وباوربوينت، بما في ذلك ميزات الرئيسية وواجهات المستخدم ووظائفها الشائعة. 2. إنشاء المستندات وتنسيقها وإدارتها بكفاءة في مايكروسوفت وورد، باستخدام الأنماط والسمات وخيارات تخطيط الصفحة والروؤوس والتذييلات والجدول والصور والكائنات. 3. استخدام مايكروسوفت إكسل لإدخال البيانات ومعالجتها وإجراء العمليات الحسابية الأساسية باستخدام الصيغ والدوال، وفرز البيانات وتصنيفها، وإنشاء المخططات والرسوم البيانية. 4. اكتساب مهارة إنشاء الشرائح وتحريرها، وتطبيق السمات والقوالب وعناصر الوسائط المتعددة، واستخدام الميزات المتقدمة في مايكروسوفت وباوربوينت. 5. توظيف تقنيات معالجة النصوص في مايكروسوفت وورد، بما في ذلك دمج المراسلات والتعاون في المستندات وإنشاء مستندات احترافية وإدارة المراجع والاقتباسات. 6. تطبيق مهارات تحليل البيانات المتقدمة في مايكروسوفت إكسل، بما في ذلك الصيغ والدوال المتقدمة والتحقق من صحة البيانات والتنسيق الشرطي والجدول المحورية. 7. تعاون وشارك المستندات بفعالية باستخدام ميزات Microsoft Office، مثل المشاركة والتأليف المشترك، والتعليقات، وتتبع التغييرات، وحماية المستندات. أتمتة المهام في Word و Excel و PowerPoint باستخدام وحدات الماكرو، وتخصيص الشريط، وإنشاء اختصارات، ودمج البيانات بين التطبيقات لتعزيز الإنتاجية والكفاءة.
Indicative Contents المحتويات الإرشادية	تتضمن المحتويات الإرشادية لوحدة تطبيقات الحاسوب ما يلي: 1. مقدمة إلى حزمة مايكروسوفت أوفيس: [8 ساعات] 2. أساسيات مايكروسوفت وورد: [8 ساعات] 3. ميزات مايكروسوفت وورد المتقدمة: [8 ساعات] 4. أساسيات مايكروسوفت إكسل: [8 ساعات] 5. ميزات مايكروسوفت إكسل المتقدمة: [8 ساعات] 6. أساسيات مايكروسوفت باوربوينت: [8 ساعات] 7. ميزات مايكروسوفت باوربوينت المتقدمة: [8 ساعات] 8. تقنيات معالجة النصوص في مايكروسوفت وورد: [8 ساعات] 9. تحليل البيانات في مايكروسوفت إكسل: [8 ساعات] 10. تصميم العروض التقديمية في مايكروسوفت باوربوينت: [8 ساعات] 11. التعاون والمشاركة في مايكروسوفت أوفيس: [8 ساعات] 12. أتمتة المهام في مايكروسوفت أوفيس: [8 ساعات]



	13. دمج تطبيقات أوفيس: [8 ساعات]
	14. نصائح وحيل متقدمة: [8 ساعات] [ساعات]
	15. المشاريع النهائية والمراجعة: [8 ساعات]
1.	

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	صُممت استراتيجيات التعلم والتعليم والتدريس المُستخدمة في وحدة الرياضيات التطبيقية لتيسير المشاركة الفعّالة والتفكير النقدي والتطبيق العملي للمفاهيم الرياضية. وتشمل هذه الاستراتيجيات الشائعة ما يلي: 1. المحاضرات: تُعد المحاضرات الوسيلة الأساسية لتقديم المحتوى، حيث يعرض المُدرّسون المفاهيم والنظريات والتقنيات الرئيسية. وقد تتضمن المحاضرات وسائل بصرية وأمثلة وعروضًا توضيحية لتعزيز الفهم وتوفير سياق واقعي. 2. المناقشات التفاعلية: تُشجع المناقشات التفاعلية مشاركة الطلاب وتُسهّل فهم المادة بشكل أعمق. ويُشجع الطلاب على طرح الأسئلة ومشاركة أفكارهم والمشاركة في مناقشات حول مواضيع محددة أو استراتيجيات حل المشكلات. 3. جلسات حل المشكلات: تُتيح جلسات حل المشكلات للطلاب تطبيق المبادئ الرياضية لحل مجموعة متنوعة من المشكلات. ويمكن عقد هذه الجلسات بشكل جماعي أو فردي، مما يسمح للطلاب بالتعاون وتبادل الأفكار وتطوير مهارات حل المشكلات. 4. التمارين العملية: تتضمن التمارين العملية تطبيقًا عمليًا للمفاهيم الرياضية من خلال مهام حسابية أو تمارين نمذجة أو محاكاة. تعزز هذه التمارين المعرفة النظرية وتساعد الطلاب على تطوير مهاراتهم في استخدام الأدوات والبرامج الرياضية. 5. دراسات الحالة والتطبيقات العملية: تُظهر دراسات الحالة والتطبيقات العملية أهمية الرياضيات في مختلف المجالات. يحلّل الطلاب مسائل رياضية ويحلونها بناءً على سيناريوهات واقعية، مما يمكنهم من ربط المفاهيم النظرية بالتطبيقات العملية. 6. التعلم القائم على الحاسوب: تُستخدم موارد التعلم القائمة على الحاسوب، مثل الدروس التعليمية عبر الإنترنت، والمحاكاة التفاعلية، والبرامج الرياضية، لتعزيز فهم الطلاب ومهاراتهم في تطبيق التقنيات الرياضية. 7. المشاريع الجماعية: تُعزز المشاريع الجماعية العمل الجماعي والتواصل ومهارات حل المشكلات. يعمل الطلاب بشكل تعاوني على مشاريع رياضية أو مهام بحثية، مما يتيح لهم استكشاف مواضيع أو تطبيقات متقدمة في الرياضيات. 8. التعلم الذاتي: يُشجع الطلاب على تحمل مسؤولية تعلمهم من خلال الانخراط في الدراسة الذاتية. قد يشمل ذلك قراءة الكتب الدراسية الموصى بها، واستكشاف مصادر إضافية، وممارسة حل المشكلات بشكل مستقل.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا



Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	49	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	26	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري

	Material Covered
Week 1	مقدمة إلى حزمة مايكروسوفت أوفيس
Week 2	• نظرة عامة على مايكروسوفت وورد، وإكسل، وباوربوينت
Week 3	• فهم واجهة المستخدم والميزات الشائعة
Week 4	• أساسيات مايكروسوفت وورد
Week 5	• إنشاء المستندات وحفظها وفتحها
Week 6	• تنسيق النصوص والفقرات
Week 7	• العمل مع الأنماط والسمات
Week 8	• ميزات مايكروسوفت وورد المتقدمة
Week 9	• خيارات تخطيط الصفحة وتنسيقها
Week 10	• العمل مع الرؤوس والتذييلات وأرقام الصفحات
Week 11	• استخدام الجداول والصور والكائنات الأخرى
Week 12	• أساسيات مايكروسوفت إكسل
Week 13	• مقدمة إلى جداول البيانات وأوراق العمل
Week 14	• إدخال البيانات ومعالجتها
Week 15	- الصيغ والدوال



Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
Week	المادة المطاة
Week 1	• مقدمة إلى بيئة المختبر وحزمة برامج مايكروسوفت أوفيس - إعداد المختبر وتثبيت البرامج. نظرة عامة على أدوات وميزات حزمة مايكروسوفت أوفيس.
Week 2	
Week 3	• مختبر مايكروسوفت وورد - إنشاء المستندات وتحريرها وتنسيقها. إدراج الصور والجداول وتنسيقها.
Week 4	
Week 5	• مختبر مايكروسوفت إكسل - إنشاء جداول البيانات وإدخال البيانات. الصيغ والدوال لإجراء العمليات الحسابية.
Week 6	
Week 7	• مختبر مايكروسوفت باوربوينت - إنشاء الشرائح وتحريرها وتصميمها. إضافة عناصر الوسائط المتعددة والرسوم المتحركة.
Week 8	
Week 9	• مختبر تقنيات معالجة النصوص - دمج المراسلات وتمارين التعاون في المستندات. إنشاء مستندات احترافية بتنسيق متقدم.
Week 10	
Week 11	• مختبر تحليل البيانات باستخدام إكسل - تمارين متقدمة على الصيغ والدوال. فرز البيانات وتصنيفها وتحليلها.
Week 12-15	تطبيقات في البرمج

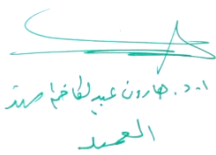
Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	M. E. Vermaat, S. M. Freund, C. Hoisington, and E. Schmieder, "Microsoft Office 365 & Office 2019: Introductory," Boston, MA: Cengage Learning, 2020.	Yes
Recommended Texts	Triad Interactive, Inc., "Microsoft Office 2019: A Skills Approach," Boston, MA: Cengage Learning, 2019.	Yes
Websites	The Collage E-Library	



Grading Scheme				
مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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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.				


د.أ. هارون عبد الكاظم
عميد الكلية : أ.د. هارون عبد الكاظم شهد
التاريخ : 2026 / 3 / 20


رئيس القسم : أ.د. محمود شاكر نصر
التاريخ : 2026 / 3 / 20



Ammar I.
اسم التدريسي: عمار ابراهيم
التاريخ : 2026 / 3 / 20



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Differential Mathematics		Module Delivery
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MIET1103		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGI	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader		e-mail	ruqia_alaa_ibrahim@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	ruqia_alaa_ibrahim@hilla-unc.edu.iq
Scientific Committee Approval Date	15/3/2026	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 Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of Differential calculus through a broad range of Differentiation techniques. 2. To understand limits and theory of derivative and apply it on various types of functions. 3. This is the basic subject for all engineering fields. 4. Demonstrate basic knowledge and understanding of a core of plane analytical geometry, algebra and applied mathematics. 5. Introduce students to Derivatives of trigonometric functions and their inverses.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recall basic concepts of calculus: functions, variables, limits, and continuity. 2. Use the limit laws to evaluate the limit of a function. 3. Discuss continuity at a point and continuity over an interval. 4. Understand transcendental functions and how a function and its inverse are related. 5. Define Plane analytical geometry and identify how conic sections are formed in addition to define both in words and in algebraic formulae, a circle and its center and radius, and an ellipse and its foci. 6. Learn how to convert rectangular coordinates to polar coordinates and vice versa, as well as plot points using polar coordinates. 7. Differentiate algebraic and transcendental functions Midterm 8. Discuss Chain rules and applications of the derivatives. 9. Define determinants and understand their relation to matrices · Also explain the methodology for finding a determinant. 10. Learn how to solve Linear equations by Cramer's rule.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Limits and Continuity, Trigonometric functions, and their inverses. Hyperbolic and inverse hyperbolic functions, Exponential function and logarithmic function. Plane analytical geometry, parabola & ellipse, hyperbola. [25 hrs] 2. Polar coordinates, Theory and rules of derivatives, Implicit Differentiation and Chain rules, Derivatives of trigonometric functions and their inverses. Derivatives of Transcendental functions and their inverses. [33 hrs] 3. Properties of determinants, Solution of Linear equations by Cramer's rule. [10 hr] 4. Revision problem classes [5 hrs]

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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. Classes and interactive lessons will be used to achieve this.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
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
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	6 and 10	LO #2, #7, #9, and #10
	Online assignments	2	10% (10)	4 and 12	LO #1 - #5 and #6 - #10
	Report	1	10% (10)	14	LO #1 - #8
	OnSite assignments	2	10% (10)	2 and 5	LO #1 - #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	LO #1 - #10
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Limits and Continuity
Week 2	Transcendental functions- trigonometric functions, and their inverses.
Week 3	Transcendental functions-Hyperbolic and inverse hyperbolic functions
Week 4	Transcendental functions-Exponential function and logarithmic function.
Week 5	Plane analytical geometry, parabola & ellipse, hyperbola.
Week 6	Polar coordinates.
Week 7	Mid-term Exam
Week 8	Theory and rules of derivatives
Week 9	Implicit Differentiation and Chain rules.
Week 10	Derivatives of trigonometric functions
	Derivatives of inverse trigonometric functions.
Week 11	Derivatives of the exponential and natural logarithms functions.
Week 12	Derivatives of Hyperbolic and inverse hyperbolic functions.
Week 13	Applications of the derivatives.
Week 14	Determinants and properties of determinants.
Week 15	Solution of Linear equations by Cramer’s rule. + Preparatory week before the final Exam



	Text	Available in the Library?
Required Texts	Engineering Mathematics I (pdf)	No
Recommended Texts	Thomas ' Calculus (pdf) Fouteenth edition Based on the original work by GEORGE B. THOMAS, JR.	No
Websites	https://elearningatria.files.wordpress.com/2013/10/differential-calculus-1-23.pdf http://dl.konkur.in/post/Book/Paye/Thomas-Calculus-14th-Edition-%5Bkonkur.in%5D.pdf	

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

د. هارون عبد الكاظم محمد
العميد

عميد الكلية : أ.د. هارون عبد الكاظم شهد
التاريخ : 2026 / 3 / 15

رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15

اسم التدريسي: م.م. رقية علاء ابراهيم

التاريخ : 2026 / 3 / 15



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Drawing		Module Delivery
Module Type	Support		☐ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	EETC102		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGI	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Assist. Prof. Dr. Ahmed M. Shimmari	e-mail	Ahmed.m.ojiemy@gmail.com
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Assist. Prof. Dr. Ahmed M. Shimmari	e-mail	Ahmed.m.ojiemy@gmail.com
Peer Reviewer Name	Assist. Prof. Dr. Ahmed M. Shimmari	e-mail	
Scientific Committee Approval Date	23/3/2026	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	The module aims for the Basics of Engineering Drawing courseware is to teach the student the basic commands necessary for professional 2D drawing, design, and drafting using AutoCAD. Upon completion of the course, the student will: • Become familiar with the AutoCAD user interface. • Understand the fundamental concepts and features of AutoCAD. • Use the precision drafting tools in AutoCAD to develop accurate technical drawings. • Present drawings in a detailed and visually impressive manner. • Develop a level of comfort and confidence with AutoCAD through hands-on experience.
Module Learning Outcomes	Upon completion of the course, students should be able to: 1. The student will describe key terms and concepts associated with drafting and the drafting profession. • Identifying software drafting tools (e.g. AutoCAD, Micro station, SolidWorks, and Google Sketch Up). 2. The student will identify elements of the AutoCAD software interface. • Starting the AutoCAD program from the start menu. • Using existing AutoCAD templates to create drawing documents. • Identifying file extensions (such as.dwg, dxf, dwt, and .bak) and file locations. • Creating, formatting, editing and saving an Auto CAD drawing. 3. The student will demonstrate an understanding of the skills necessary to create basic 2D AutoCAD drawings. • Drawing lines, curves, circles, ellipses, rectangles, polygons, and donuts. • Modifying a drawing using the Erase tool. • Identifying and using the various types of Object Snaps and Auto tracking. • Using the offset tool, drawing points, construction lines and rays.

	4. The student will demonstrate the ability to modify an AutoCAD drawing. • Creating and managing multiple layers that define line color, line width, line type, etc. • Identifying and using object editing tools (such as fillet, chamfer, break, join, trim, extend, lengthen, and scale). • Arranging and patterning objects with move, copy, mirror, rotate, align, and array. 5. The student will demonstrate an understanding How to assign: Dimension - Linear, Aligned, Radius, Diameter, Center Mark, Angle, Arc length, Continuous, Baseline, Tolerance, Dimension Space. 6. The student will demonstrate an understanding Dealing with: Text, Style, M text, Scale text, Spell, 7. The student will demonstrate the Object viewing. • Zooming techniques • Panning techniques 8. The student will demonstrate the ability to output drawings in AutoCAD. 9. Drawing 3d modeling. 10. Drawing the Exercises.
Indicative Contents	Indicative content includes the following. Basic Drawing & Editing Commands • Drawing Lines • Erasing Objects • Drawing Lines with Polar Tracking • Drawing Rectangles • Drawing Circles • Undo and Redo Actions [20 hrs.] Making Changes in Your Drawing • Selecting Objects for Editing • Moving Objects • Copying Objects • Rotating Objects • Scaling Objects • Mirroring Objects • Editing with Grips [4 hrs.] Display Control • Zoom • Pan • Redraw • Clean Screen. [4 hrs.] Adding Dimensions •Dimensioning Concepts •Adding Linear Dimensions



	•Adding Radial and Angular Dimensions •Editing Dimensions [4 hrs.] Hatching •Hatching •Editing Hatches [4hrs] Printing Your Drawing •Printing Layouts •Print and Plot Settings [4 hrs.] 3D MODELLING, Convert 2D to 3D, Solid Editing [19 hrs.]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When it comes to learning and teaching engineering drawing using AutoCAD, there are several strategies that can be effective. Here are some recommendations: 1. Familiarize with the Software: Before diving into engineering drawing concepts, it's important to become familiar with the AutoCAD software. This includes understanding the user interface, basic tools, and commands. Start with introductory tutorials or online resources that cover the basics of AutoCAD. 2. Start with Fundamentals: Begin by teaching the fundamental concepts of engineering drawing, such as orthographic projection, isometric projection, dimensioning, and tolerancing. Explain the principles and techniques used in creating accurate and clear technical drawings. 3. Hands-on Practice: Engineering drawing is a practical skill, so provide ample opportunities for hands-on practice. Assign exercises and projects that require students to create different types of drawings using AutoCAD. Encourage them to explore and experiment with various tools and commands. 4. Step-by-Step Instructions: Break down complex drawing tasks into smaller, manageable steps. Provide step-by-step instructions and demonstrations using AutoCAD, showing students how to execute each step effectively. This approach helps students understand the workflow and build their confidence. 5. Visual Aids and Examples: Utilize visual aids, such as slides, diagrams, and examples, to reinforce concepts. Show real-world engineering drawings and explain how they were created using AutoCAD. Visual representations can enhance understanding and make abstract concepts more tangible. 6. Group Activities and Collaboration: Promote collaboration among students by assigning group activities or projects. This allows them to work together, share knowledge, and learn from one another. Encourage students to discuss their approaches and problem-solving techniques related to engineering drawing.



	AutoCAD. 7. Provide Feedback: Regularly provide constructive feedback on students' drawings. Highlight areas for improvement, suggest alternative methods, and point out common mistakes. This feedback loop is crucial for students to refine their skills and develop a deeper understanding of engineering drawing principles. 8. Stay Updated with AutoCAD Features: AutoCAD is regularly updated with new features and enhancements. Stay up to date with these changes to ensure you're teaching the latest tools and workflows. Familiarize yourself with new capabilities that can improve efficiency and accuracy in engineering drawing. 9. Online Resources and Communities: Encourage students to explore online resources, tutorials, and communities dedicated to AutoCAD and engineering drawing. There are numerous websites, forums, and YouTube channels that offer valuable content and support for learning AutoCAD. 10. Project-Based Learning: Incorporate project-based learning into the curriculum, where students can apply their engineering drawing skills to real-world scenarios. Assign projects that simulate industry-related tasks, such as creating architectural plans, mechanical assemblies, or electrical schematics using AutoCAD.
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Student Workload (SWL) الحمل الدراسي للطالب محسوب ل 15 اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعي	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعي	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	5, 12	(LO #3,4) (LO #5,6)
	Online Assignments	3	6% (6)	Continuous	(LO # 3-5) (LO # 6-10)
	Projects	1	10% (10)	13	All
	Onsite	4	1% (1)	4, 5, 10, 11	LO # 3-9



	assignment				
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-5
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Autodesk AutoCAD - Starting the Software - User Interface - Working with Commands - Cartesian Workspace - Opening an Existing Drawing File - Saving a Drawing File
Week 2	Basic Drawing & Editing Commands - Drawing Lines - Erasing Objects - Drawing Lines with Polar Tracking - Drawing Rectangles - Drawing Circles - Undo and Redo Actions
Week 3	Projects - Creating a Simple Drawing - Create a Simple Drawing - Create Simple Shapes
Week 4	Drawing Precision in AutoCAD - Using Running Object Snaps - Using Object Snap Overrides - Polar Tracking at Angles - Object Snap Tracking - Drawing with Snap and Grid
Week 5	Making Changes in Your Drawing - Selecting Objects for Editing - Moving Objects - Copying Objects - Rotating Objects - Scaling Objects



	• Mirroring Objects • Editing with Grips
Week 6	Advanced Object Types • Drawing Arcs • Drawing Polylines • Editing Polylines • Drawing Polygons • Drawing Ellipses
Week 7	Advanced Editing Commands • Trimming and Extending Objects • Stretching Objects • Creating Fillets and Chamfers • Offsetting Objects • Creating Arrays of Objects
Week 8	Mid-term exam
Week 9	Adding Dimensions •Dimensioning Concepts •Adding Linear Dimensions •Adding Radial and Angular Dimensions •Editing Dimensions Text •Working with Annotations •Adding Text in a Drawing •Modifying Multiline Text •Formatting Multiline Text •Adding Notes with Leaders to Your Drawing
Week 10	Hatching •Hatching •Editing Hatches
Week 11	3D modeling
Week 12	Convert 2D To 3D.
Week 13	Exercises drawing
Week 14	Printing Your Drawing •Printing Layouts •Print and Plot Settings

Week 15	Preparatory week before the final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	D. A. Madsen, D. P. Madsen, and J. E. Briesacher, Engineering Drawing and Design, 5th ed., Clifton Park, NY: Delmar Cengage Learning, 2011.	Yes
Recommended Texts	F. E. Giesecke, A. Mitchell, H. C. Spencer, I. L. Hill, and J. T. Dygdon, Technical Drawing with Engineering Graphics, 15th ed., Upper Saddle River, NJ: Pearson, 2016.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering	

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

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١٠٤٠ ابن عبد الحفيظ
العبيد





عميد الكلية : أ.د. هارون عبد الكاظم شهد

اسم التدريسي: أ.م.د. احمد محمد الشمري

رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 23

التاريخ : 2026 / 3 / 23

التاريخ : 2026 / 3 / 23

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	English Language 1		Module Delivery	
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MTU1002			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level		UGI	Semester of Delivery	1
Administering Department		Hilla University	College	Faculty of engineering techniques
Module Leader		Qamar Marjan	e-mail	
Module Leader's Acad. Title		Lecturer Assistant	Module Leader's Qualification	MSc.
Module Tutor			e-mail	
Peer Reviewer Name		Qamar Marjan	e-mail	Aml.alzubedy@mtu.edu.iq
Scientific Committee Approval		20/3/2026	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 module aims of English Language (1) are designed to help learners at the beginner – pre-intermediate level develop their English language skills and achieve specific learning objectives, By the end of this course, students will:

1. Grammar Mastery: Develop a strong command of grammar rules, including possessive forms, question words, pronouns, prepositions, present simple, past simple, present continuous, past continuous, comparative and superlative adjectives, verb patterns, modal verbs (have/got to, should, must), time and conditional clauses, present perfect, past perfect, reported statements, and more.
2. Vocabulary Expansion: Expand their vocabulary in various contexts, covering numbers, family members, rooms and furniture, locations in and out of town, food and dining, parts of speech, synonyms, antonyms, and phrasal verbs.
3. Everyday English Proficiency: Develop practical language skills for everyday communication, including greetings, introductions, short answers, conversations, and expressions commonly used in daily life.
4. Reading Comprehension: Improve their reading comprehension skills through the analysis of diverse texts, including stories, articles, and informative content on a wide range of topics.
5. Writing Competence: Enhance their writing abilities by composing informal letters, using linking words, writing reviews of books or films, and crafting stories.
6. Critical Thinking and Analysis: Develop critical thinking skills by analyzing and discussing texts, comparing and contrasting information, and drawing conclusions from reading materials.
7. Cultural Awareness: Gain cultural insights through readings and discussions about various cultures and places around the world, fostering a broader worldview.
8. Effective Communication: Improve their ability to express ideas clearly and confidently in both spoken and written forms, making them effective communicators in English.
9. Language Assessment: Prepare for assessments, including a midterm exam, by reviewing and demonstrating their understanding of grammar, vocabulary, and reading comprehension.
10. Independent Learning: Develop independent learning skills, enabling them to continue improving their English language proficiency beyond the course.
11. Language Fluency: Work towards achieving fluency in English, allowing



	them to engage in conversations, express thoughts, and write coherently with ease. 12. Cultural Competency: Build cultural competence and sensitivity through exposure to diverse texts and discussions about different cultures and lifestyles. These course goals reflect the overarching objectives of the English class and provide a clear direction for student learning and language development throughout the 15-week course.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The learning outcomes for English (1) 15-week English class syllabus: 1. Students will comprehend and discuss texts on different topics 2. Students will expand their vocabulary related to various topics 3. Students will acquire vocabulary related to Various topics 4. Students will be able to write letters , and reviews. 5. Students will be able to use possessive forms correctly in sentences, indicating ownership. 6. Students will master question words, pronouns, and prepositions. 7. Students will distinguish between present simple and past simple tenses. 8. Students will learn about the present continuous, present simple vs. continuous, and have & have got. 9. Students will study the past continuous and quantity and articles. 10. Students will understand comparative and superlative adjectives. 11. Students will focus on verb patterns, future intentions, and present perfect and past simple tenses. 12. Students will study modal verbs (have/got to, should, must). 13. Students will learn about time and conditional clauses. 14. Students will cover present perfect continuous, present perfect simple vs. continuous, past perfect for clarification, and reported statements
Indicative Contents المحتويات الإرشادية	Beginners book : Grammar : Possessive (CH1,2,4) Vocabulary – numbers –(CH1, 2, 5) -- the family (Ch4) Every day English-all (Ch1,3) Reading- where are they (Ch2) , The Chairty Walk, (Ch3) , My best Friend,(Ch4) (2 hours) Grammar : Question words (CH 7) – Pronouns (Ch7) – Prepositions (Ch8)



Vocabulary – Rooms and Furniture –(CH8) – in and out of Town (Ch4),
Saying Years (ch9)

Every day English-all (Ch 9)

Reading- A Postcard from San Fransisco (Ch7) , Vancouver , the best city in
the world, (Ch8) , It is a Jacksin Pollock ,(Ch9) (2 hours)

Grammar : Present Simple (Ch5,6)- Past Simple (Ch9,10)

Vocabulary – shopping, food, in a restaurant (ch12)

Every day English-all (Ch 14)

Reading- The internet (Ch11) , You are what you eat (Ch12) , This week is
different (Ch13) , Life's big events (Ch14) (2 hours)

Pre-intermediate book:

Grammar : -

Vocabulary – Parts of speech (ch1,3, 7)

Every day English-Social expressions (Ch 1)

Reading- People the great communicators (Ch1)

Writing- A letter to a pen friend (informal) (Ch1) (2 hours)

Grammar : - Present continuous – Present simple vs. continuous- have &have
got (ch2)

Vocabulary –

Every day English-Making conversation (Ch 2)

Reading- Living in the USA (Ch2)

Writing- Linking words (Ch2,3) (2 hours)

Grammar : - Past continuous (ch3) – Quantity and Articles (Ch4)

Vocabulary –

Every day English-

Reading- The burglar's friend – The thief, his mother and 2 billion – Sherlock
Holmes the three students (Ch3)

Writing- (2 hours)

Grammar : - comparative and superlative adj (ch6)

Vocabulary – synonyms and antonyms (ch6)

Every day English-

Reading- Markets around the world(Ch4)



Writing- (2 hours)

Grammar :

Vocabulary:

Every day English:

Reading- Hollywood Kids (Ch5) – A tale of two millionaires (ch6)

Writing- (2 hours)

Grammar : Verb Patterns (Ch5) – Future intentions (Ch5)- Present Perfect and Past simple (ch7)

Vocabulary:

Every day English:

Reading:

Writing: Relative clauses (ch6,7)..... (2 hours)

Grammar : have (got)to, should, must (ch8)

Vocabulary: -

Every day English: Short Answers (ch7) – At the doctor's (ch8)

Reading- Celebrity interview from Hi (Ch7)

Writing- (2 hours)

Grammar : Time and conditional clauses (ch9)

Vocabulary: -

Every day English: In a hotel (ch9)

Reading- Problem page (Ch8)

Writing- Formal letter (ch8) (2 hours)

Grammar :

Vocabulary: -

Every day English: Exclamation (ch11) – saying goodbye (ch14)

Reading- The world's first megalopolis (Ch9)

Writing- writing a review of a book or a film (ch11)..... (2 hours)

Grammar :

Vocabulary: Phrasal verbs (ch12)- word formation (ch3)

Every day English: Social expressions (ch12)



Reading- Super volcano (Ch12)

Writing- writing a story (ch14)..... (2 hours)

Grammar : present perfect continuous (ch13) - Present perfect simple vs continuous (ch13)- Past perfect for clarification (ch14) – Reported statement (ch14)

Vocabulary:

Every day English:

Reading- A funny way to earn a living (Ch13)

Writing- (2 hours)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

The learning and teaching strategies for the English Language (Beginner) module may include:

1. Interactive Language Practice: Engage learners in communicative activities that promote active participation and language practice. This can include pair work, group discussions, role-plays, and language games.
2. Authentic Materials: Incorporate authentic materials such as videos, audio recordings, and reading texts that reflect real-life language use. This helps learners develop their listening, speaking, reading, and writing skills in authentic contexts.
3. Task-Based Learning: Design tasks and projects that require learners to use the target language to accomplish specific goals or solve problems. This promotes meaningful language use and encourages critical thinking and problem-solving skills.
4. Visual Aids and Multimedia: Utilize visual aids, charts, diagrams, and multimedia resources to support language learning and comprehension. Visuals can enhance understanding, aid in vocabulary acquisition, and provide context for language use.
5. Error Correction and Feedback: Provide timely and constructive feedback on learners' language production to help them identify and correct errors. Encourage self-correction and peer correction to foster a supportive learning environment.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا



Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 12	LO #1-6 and 1,2,4,10-12
	Assignments	2	10% (10)	4, 10	LO # 1-7 and 1-11
	Discussion	2	10% (10)	continuous	1-14
	Onsite assignment	5	10% (10)	continuous	1-14
Summative assessment	Midterm Exam	2 hours	10% (10)	7	LO # 1-9
	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Grammar : Possessive (CH1,2,4) Vocabulary – numbers –(CH1, 2, 5) -- the family (Ch4) Every day English -all (Ch1,3) Reading - where are they (Ch2) , The Chairty Walk, (Ch3) , My best Friend,(Ch4)
Week 2	Grammar : Question words (CH 7) – Pronouns (Ch7) – Prepositions (Ch8) Vocabulary – Rooms and Furniture –(CH8) – in and out of Town (Ch4), Saying Years (ch9) Every day English -all (Ch 9) Reading - A Postcard from San Fransisco (Ch7) , Vancouver , the best city in the world (Ch8) , It is a Jacksin Pollock (Ch9)



Week 3	Grammar : Present Simple (Ch5,6)- Past Simple (Ch9,10) Vocabulary – shopping, food, in a restaurant (ch12) Every day English- all (Ch 14) Reading- The internet (Ch11) , You are what you eat (Ch12) , This week is different (Ch13) , Life's big events (Ch14)
Week 4	Vocabulary – Parts of speech (ch1,3, 7) Every day English- all (Ch 1) Reading- People the great communicators (Ch1) Writing- A letter to a pen friend (informal) (Ch1)
Week 5	Grammar : - Present continuous – Present simple vs. continuous- have & have got (ch2) Every day English- Making conversation (Ch 2) Reading- Living in the USA (Ch2) Writing- Linking words (Ch2,3)
Week 6	Grammar : - Past continuous (ch3) – Quantity and Articles (Ch4) Reading- The burglar's friend – The thief, his mother and 2 billion – Sherlock Holmes the three students (Ch3)
Week 7	Midterm
Week 8	Grammar: - comparative and superlative adj (ch6) Vocabulary – synonyms and antonyms (ch6) Reading- Markets around the world (Ch4)
Week 9	Reading- Hollywood Kids (Ch5) – A tale of two millionaires (ch6)
Week 10	Grammar : Verb Patterns (Ch5) – Future intentions (Ch5)- Present Perfect and Past simple (ch7) Writing: Relative clauses (ch6,7)
Week 11	Grammar : have (got)to, should, must (ch8) Every day English: Short Answers (ch7) – At the doctor's (ch8) Reading- Celebrity interview from Hi (Ch7)
Week 12	Grammar : Time and conditional clauses (ch9) Every day English: In a hotel (ch9) Reading- Problem page (Ch8) Writing- Formal letter (ch8)
Week 13	Every day English: Exclamation (ch11) – saying goodbye (ch14) Reading- The world's first megalopolis (Ch9) Writing- writing a review of a book or a film (ch11)
Week 14	Vocabulary: Phrasal verbs (ch12)- word formation (ch3) Every day English: Social expressions (ch12) Reading- Super volcano (Ch12) Writing- writing a story (ch14)
Week 15	Grammar : present perfect continuous (ch13) - Present perfect simple vs continuous (ch13)- Past perfect for clarification (ch14) – Reported statement (ch14) Reading- A funny way to earn a living (Ch13)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available Libra	
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Required Texts	Soars, J., Soars, L. (2014). New Headway Plus: Beginner Student's Book. United Kingdom: Oxford University Press. • Soars, J., Soars, L. (2006). New Headway Plus: Pre-intermediate. United Kingdom: Oxford University Press.	Yes
Recommended Texts	Audio CDs or Online Audio: Recordings of listening exercises, dialogues, and pronunciation practice. Beginner workbook Pre-intermediate Workbook	No
Websites		

Grading Scheme

مخطط الدرجات

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

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



will be the automatic rounding outlined above.

أ.د. هارون عبد الكاظم شهد
العميد

عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 20

رئيس القسم : أ.د. محمود شاكر نصر

رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 20



Qammar Majan

اسم التدريسي: م.م. قمر مرجان

التاريخ : 2026 / 3 / 20

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية

Module Title	Fundamentals of Electrical Engineering (DC)			Module Delivery	
Module Type	Core			☒Theory ☐Lecture ☒Lab ☒Tutorial ☐Practical ☐Seminar	
Module Code	MIET1101				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UGI	Semester of Delivery		1
Administering Department		MIET	College	Engineering Technologies	
Module Leader	قسم هندسة تقنيات الأجهزة الطبية		e-mail	mortezaabbas@hilla-unc.edu.iq	



Module Leader's Acad. Title	Asst. Lecturer	Module Leader's Qualification	M.Sc
Module Tutor	مرتضى عباس عمران	e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	14/3/2026	Version Number	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To develop knowledge on standard units of electricity and understanding of DC circuit theorems. 2. To understand voltage, current and power of DC circuits. 3. To learn the basic concept of DC electrical circuits connections. 4. To explain the DC electrical circuits. 5. To understand basic laws of electricity. 6. To perform DC-network theorem. 7. To perform DC-circuit analysis methods. 8. To understand independent sources and dependent sources.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Describe electrical power, voltage, and current. 5. Define Ohm's law and define the relation between voltage, resistance, and current. 6. Identify the basic circuit elements and their applications. 7. Discuss the operations of power and energy in electric circuit.



	8. Discuss the various properties of resistors connections. 9. Explain the two Kirchhoff's laws used in circuit analysis. 10. Identify the implementation of resistor circuit's connection. 11. Learn measurements of voltage and current. 12. Practical Identification of resistance based on color code.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. DC circuits – Current and voltage definitions, and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law, Network reduction, Introduction to mesh and nodal analysis. [20 hrs] Conversion of delta – connected resistance into an equivalent Wye connection & Vice versa. [10 hrs] Fundamentals of the Power sources connected in parallel, Thevenin and Norton equivalent circuits, current and voltage division, Loop current method, Super position method, maximum power transfer, Non- linear direct current circuit [20 hrs] Independent sources and dependent sources [10 hrs] source transformation [5 hrs] Revision problem classes [5 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types 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	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
Total SWL (h/sem)	150		



الحمل الدراسي الكلي للطلاب خلال الفصل	
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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, LO# 10 and 11
	Online Assignments	2	10% (10)	2, 12	LO # 3, 4, LO# 6, 7
	Projects	1	6% (6)	Continuous	LO# 1-12
	lab	10	10% (10)	Continuous	LO# 1-12
	Report	1	4% (4)	13	LO # 5, 8, 9, 12
Summative assessment	Midterm Exam	3 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Symbols and abbreviations, Units, Electric circuits, and its elements.
Week 2	The direct-current network (Ohm's law, Kirchhoff's voltage and current laws & their use in network).
Week 3	Series elements and Voltage Division
Week 4	Parallel elements and Current Division
Week 5	Power sources are connected in parallel,
Week 6	Circuit analysis methods:
Week 7	1- Node voltage method. 2- Loop current method.
Week 8	Mid-term exam



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week 9	Conversion of delta–connected resistance into an equivalent Wye connection & Vic versa
Weeks 10-13	Circuit analysis Theorems: 1. Superposition 2. Thevenin 3. Norton 4. Maximum power
Weeks 14-15	Independent sources and Dependent sources, source transformation and preparation for final exam



Grading Scheme

مخطط الدرجات

Week 1	circuits.
Week 2	Resistance measurement based on AVO meter readings and color code identification.
Week 3	Verification of Ohm's Law
Weeks 4-5	Verification of KVL and KCL
Weeks 6-7	Verification of Thevenin's and Norton's theorems
Weeks 8-9	Verification of the superposition theorem
Week 10	Verification of the maximum power transfer theorem
Week 11	Verification of the Nodal Voltage Theorem
Week 12	Verification of the Mesh Theorem
Weeks 13-14	practical implementation of Independent sources and Dependent sources
Week 15	Preparation for Final exam

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	Electric Circuits Seventh Edition, Schaum's Outline Series	No
Websites	https://www.youtube.com/watch?v=SfKw8bHk7-o (for practical implementation of Independent sources and Dependent sources, Weeks 13-14)	



Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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العميد

عميد الكلية : أ.د. هارون عبد الكاظم شهد

رئيس القسم : أ.د. محمود شاكر نصر

اسم التدريسي: م.م. مرتضى عباس عمران

التاريخ : 2026 / 3 / 15

التاريخ : 2026 / 3 / 15

التاريخ : 2026 / 3 / 15

MODULE DESCRIPTION FORM



نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Arabic Language I		Module Delivery	
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MTU1001			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	UGI	Semester of Delivery		1
Administering Department	MIET	College	Faculty of engineering techniques	
Module Leader	Ammar Ali		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	20/3/2026	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	أهداف المادة الدراسية هي اني يكون الطالب قادراً على أن : 1. يتعرف على أنواع الأخطاء اللغوية المشتركة وتوضيح أسبابها وكيفية تجنبها. 2. يتعلم القواعد المتعلقة بالتاء المربوطة والطويلة والتاء المفتوحة وكيفية كتابتها بشكل صحيح. 3. يتعلم قواعد كتابة الألف الممدودة والمقصورة واستخدام الحروف الشمسية والقمرية بشكل صحيح. 4. التعرف على الضاد والظاء ومعرفة كيفية التمييز بينهما في الكتابة. 5. يتعلم طرق كتابة الهمزة بشكل صحيح وفقاً للقواعد اللغوية. 6. التعرف على علامات الترقيم واستخدامها بشكل صحيح في النصوص. 7. يفهم الفروق بين الاسم والفعل والتمييز بينهما في الجمل. 8. يفهم المفاعيل وكيفية استخدامها بشكل صحيح في النصوص. 9. يتعلم الأرقام والعدد واستخدامها في التعبير عن الكميات. 10. يتجنب الأخطاء اللغوية الشائعة في سياقات عملية لتعزيز فهم القواعد وتحسين المهارات اللغوية. 11. يدرس النون والتنوين وفهم معاني حروف الجر واستخدامها بشكل صحيح في الجمل. 12. يركز على الجوانب الشكلية للخطاب الإداري وكيفية كتابته بأسلوب صحيح ومناسب. 13. التعرف على لغة الخطاب الإداري وفهم استخدامها في التواصل الإداري. 14. يفهم نماذج من المراسلات الإدارية لتطبيق المفاهيم والمهارات المكتسبة في الخطاب الإداري.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات التعلم للمادة الدراسية هي: 1. قدرة الطلاب على تحليل وتعريف الأخطاء اللغوية المشتركة وتطبيق القواعد الصحيحة لتجنبها. 2. القدرة على استخدام القواعد اللغوية المتعلقة بالتاء المربوطة والطويلة والتاء المفتوحة بشكل صحيح. 3. قدرة الطلاب على استخدام الألف الممدودة والمقصورة بشكل صحيح واستخدام الحروف الشمسية والقمرية بطريقة صحيحة. 4. تمكين الطلاب من التمييز بين الضاد والظاء وتطبيق القواعد الصحيحة في الكتابة. 5. القدرة على كتابة الهمزة بشكل صحيح وفقاً للقواعد اللغوية. 6. استخدام علامات الترقيم بشكل صحيح في النصوص المكتوبة. 7. فهم الطلاب للفروق بين الاسم والفعل وتمكينهم من استخدامها بشكل صحيح في الجمل. 8. القدرة على استخدام المفاعيل بشكل صحيح في النصوص المكتوبة. 9. استخدام الأرقام والعدد بطريقة صحيحة للتعبير عن الكميات. 10. التمكن من تطبيق الأخطاء اللغوية الشائعة في سياقات عملية وتصحيحها بشكل مناسب. 11. فهم استخدام النون والتنوين ومعاني حروف الجر واستخدامها بشكل صحيح في الجمل. 12. القدرة على كتابة الخطاب الإداري بأسلوب صحيح ومناسب وفهم لغة الخطاب الإداري. 13. تطبيق المفاهيم والمهارات المكتسبة في كتابة المراسلات الإدارية بشكل صحيح وفعال.
Indicative Contents المحتويات الإرشادية	المحتويات الإرشادية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم. ومن بين المحتويات الإرشادية المهمة: 1. مقدمة عن الأخطاء اللغوية والتعريف بالتاء المربوطة والتاء المطوَّلة والتاء المفتوحة. (3 ساعات) 2. قواعد كتابة الألف الممدودة والمقصورة والتعرف على الحروف الشمسية والقمرية. (3 ساعات) 3. دراسة الضاد والظاء وتعلم طرق كتابتهما بشكل صحيح. (3 ساعات) 4. تعلم كتابة الهمزة بشكل صحيح وفقاً للقواعد اللغوية. (3 ساعات) 5. دراسة علامات الترقيم وتعلم استخدامها بشكل صحيح في النصوص اللغوية. (3 ساعات) 6. التعرف على الاسم والفعل والتفريق بينهما وفهم القواعد المتعلقة بهما. (3 ساعات)

7. دراسة المفاعيل وتعلم استخدامها في الجمل اللغوية. (3 ساعات)
 8. التعرف على الأعداد واستخدامها بشكل صحيح في العبارات والجمل. (3 ساعات)
 9. دراسة الأخطاء اللغوية الشائعة وتطبيقاتها في النصوص اللغوية. (3 ساعات)
 10. تعلم استخدام النون والتنوين وفهم معاني حروف الجر واستخدامها بشكل صحيح في الجمل. (2 ساعات)
 11. التعرف على الجوانب الشكلية للخطاب الإداري وفهم لغته وقواعده. (2 ساعات)
 12. دراسة نماذج من المراسلات الإدارية وتطبيقها في الكتابة. (2 ساعات)
- توفر هذه المحتويات الإرشادية للطلاب فهمًا شاملاً للمفاهيم اللغوية وتعلم القواعد والتطبيقات العملية التي تساعد في تطوير مهاراتهم اللغوية.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

استراتيجيات التعلم والتعليم المستخدمة في مادة اللغة تشمل مجموعة متنوعة من النهج والتقنيات التي تعزز عملية التعلم للطلاب. من بين هذه الاستراتيجيات:

1. التفاعل النشط: يتم تشجيع الطلاب على المشاركة والمشاركة الفعالة في الدروس من خلال المناقشات الجماعية والأنشطة التفاعلية.
2. التعلم التعاوني: يشجع التعاون والتعاون بين الطلاب من خلال العمل الجماعي والمشاريع الجماعية، حيث يتعاون الطلاب مع بعضهم البعض لتحقيق أهداف التعلم المحددة.
3. التطبيق العملي: يتم توفير فرص للطلاب لتطبيق المفاهيم والمهارات المكتسبة في سياقات عملية وواقعية، مما يعزز التفاعل الفعال مع المادة.
4. استخدام التقنيات الحديثة: يستفيد الطلاب من استخدام التكنولوجيا في عملية التعلم، مثل استخدام الحواسيب والإنترنت للبحث والتعلم الذاتي.
5. توفير ردود فعل فورية: يتم توفير ردود فعل فورية وتقييم مستمر للطلاب، سواء عن طريق التقييمات الشفهية أو الكتابية، مما يساعدهم على تحسين أدائهم وتطوير مهاراتهم.
6. التنوع في وسائل التواصل: يتم استخدام مجموعة متنوعة من وسائل التواصل والتعليم، مثل المحاضرات التوضيحية، والمناقشات الجماعية، والأنشطة العملية، والعروض التقديمية، لتلبية احتياجات وأساليب التعلم المختلفة للطلاب.
7. باستخدام هذه الاستراتيجيات، يتم تعزيز التفاعل والتعلم الفعال للطلاب، و
8. تحفيزهم على المشاركة واكتساب المعرفة والمهارات بشكل شامل وشيق.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	33	Structured SWL (h/w)	2
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1
الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	



Total SWL (h/sem)	50
الحمل الدراسي الكلي للطالب خلال الفصل	

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	15% (15)	5, 10,13	LO #1, 5 and 11
	Assignments	3	15% (15)	2, 11,14	LO # 3, 6 and 12
	Projects / Lab.				
	Report	1	10% (10)	14	LO # 1-13
Summative assessment	Midterm Exam	2 hours	10% (10)	7	LO # 1-7
	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)		
المنهاج الاسبوعي النظري		
1-8	مقدمة عن الأخطاء اللغوية –التاء المربوطة والطويلة والتاء المفتوحة	الأسبوع الأول
9-14	قواعد كتابة الالف الممدودة والمقصورة – الحروف الشمسية والقمرية	الأسبوع الثاني
15-19	الضاد والطاء	الاسبوع الثالث
20-30	كتابة الهمزة	الأسبوع الرابع
31-36	علامات الترقيم	الأسبوع الخامس
37-44	الاسم والفعل والتفريق بينهما	الأسبوع السادس
45-50	المفاعيل + العدد	الأسبوع السابع
51-61	امتحان منتصف الفصل الدراسي	الأسبوع الثامن
62-69	تطبيقات الأخطاء اللغوية الشائعة	الأسبوع التاسع والعاشر
70-75	النون والتنوين - معاني حروف الجر	الاسبوع الحادي عشر
76-80	الجوانب الشكلية للخطاب الإداري	الاسبوع الثاني عشر
81-86	لغة الخطاب الإداري +نماذج من المراسلات الإدارية	الأسبوع الثالث عشر والرابع

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	- اخطاء لغوية شائعة ، تأليف: خالد بن هلال بن ناصر العنبري ، مكتبة: الجيل الواحد الطبعة الاولى. ٢- قواعد الاملاء وعلامات الترقيم ، تأليف : عبد السلام هارون، تحقيق: نبيل عبد السلام هارون، دار الكتب العلمية ، الطبعة الاولى ، ٢٠٠٥.	Yes
Recommended Texts	أقسام الكلام العربي من حيث الشكل والوظيفة، تأليف: الدكتور فاضل مصطفى الساق ، تقديم الاستاذ الدكتور: تمام حسان ، مكتبة الخانجي – القاهرة، طبعة ١٩٧٧ م.	No
Websites	The Collage E-Library	

Grading Scheme				
مخطط الدرجات				
Grade		التقدير	Marks (%)	Definition
	Excellent	امتياز	90 - 100	Outstanding Performance
Success Group (50 - 100)	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.				

م. التدريسي:
م. عمار علي
ئيس القسم :
.. محمود شاكر
م.
ميد الكلية : أ.د.
رون عبد
كاظم شهد

ريخ : 20 /
2026 /
ريخ : 20 / 3
2026

التاريخ : 2026 / 3 / 20



Level 1- semester 2

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Computer Programming and Applications I		Module Delivery	
Module Type	Support		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET1206			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	UGII	Semester of Delivery		3
Administering Department	MIET	College	Faculty of Engineering Techniques	
Module Leader	Zainab Hussain Ali		e-mail	Zainal_hussain@gmail.com
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	M.Sc
Module Tutor			e-mail	
Peer Reviewer Name	Zainab Hussain Ali		e-mail	Zainal_hussain@gmail.com
Scientific Committee Approval Date	24/3/2026		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. Understanding the fundamental concepts of MATLAB programming language environment. 2. The students will understand and learn how to use MATLAB as an effective programming language. 3. The students will be able to solve different mathematical and engineering problems as well as using plotting functions and design projects using codes or GUI. 4. Students will acquire the knowledge of basic MATLAB syntax such as: variables, input, output, vectors, matrices, functions, plotting, and GUI, 5. The students will gain the necessary skills to design and implements appropriate algorithms that solve problems dealing with different mathematical and engineering applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the MATLAB environments and windows (Command Window, Workspace Window, Command History window, Help Window, Editor Window). 2. The students learn how to write first program and learn Expressions, Constants, Entering Matrices, Useful Matrix Generators, Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns. 3. Explain how to use variables and assignment statement, logical operator. 4. Practice on using Arrays, Built in functions, Basic Matrix Functions(sum, max, min, mean, magic, diag, length, size, median, prod, sort). 5. Learn how to perform basic Plotting (Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multiple Plots in One Figure, Setting Axis Limits). 6. Understand arguments and return values, M-file, input-output statement. 7. Train on using control Statements (Conditional statements: If, Else, Else switch case) 8. Identify the repetition statements: (While statement, For statement).

	9. Learn how to use combination of conditional and repetition statements. 10. Understand the procedures and functions (a custom-made MATLAB function, define the name of the function, the input and the output variables, Calling Functions). 11. Learn how to handle graphics and user interface. 1.pre-defined dialogs 2. Handle graphics a) Graphics objects b) Properties of objects c) Modifying properties of graphics objects. 12. Train of GUI Interface (Attaching buttons to actions, Getting Input, Setting Output).
Indicative Contents المحتويات الإرشادية	1. Window, Workspace Window, Command History window, Help Window, Editor Window. (3 hr) 2. Constants, Entering Matrices, Useful Matrix Generators, Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns. (5 hr) 3. variables and assignment statement, logical operator. (5 hr) 4. sum, max, min, mean, magic, diag, length, size, median, prod, sort. (2 hr) 5. Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multiple Plots in One Figure, Setting Axis Limits. (2 hr) 6. M-file, input-output statement. (2 hr) 7. Conditional statements: If, Else, Elseif, switch case. (3 hr) 8. While statement, For statement. (4 hr) 9. conditional and repetition statements. (4 hr) 10. accustom-made MATLAB function. (4 hr) 11. GUI. (4 hr) 12. GUI attaching buttons to actions, Getting Input, Setting Output. (4 hr)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. Moreover, motivate the creative side by posing various problems to students and urging them to find appropriate solutions. Also forming work teams to assess the results of their work and change their structure periodically to develop the spirit of cooperation and development and motivate students to make intensive efforts to work different roles.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	49	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	26	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15% (20)	5, 10	LO #1, 2, 3, 4,7,8,9 and 10
	Assignments	2	15% (20)	6, 13	LO # 9 and 10
	Projects / Lab.	10	10% (10)		
	Report	N/A			
Summative assessment	Midterm Exam	3hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction, MATLAB Environment, MATLAB Windows(Command Window, Workspace Window, Command History window, Help Window, Editor Window).
Week 2	A First Program, Expressions, Constants, Entering Matrices, Useful Matrix Generators, Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns.



Week 3	Variables and assignment statement, logical operator.
Week 4	Arrays, Built in functions, Basic Matrix Functions (sum, max, min, mean, magic, diag, length, size, median, prod, sort).
Week 5	Basic Plotting (Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multiple Plots in One Figure, Setting Axis Limits).
Week 6	Arguments and return values, M-file, input-output statement, + + Control Statements (Conditional statements: If, Else, Elseif, switch case)
Week 7	Mid-Exam
Week 8	Repetition statements: (While statement, For statement)
Week 9	Combination of conditional and repetition statements I
Week 10	Combination of conditional and repetition statements II
Week 11	Procedures and Functions (a custom-made MATLAB function, define the name of the function, the input and the output variables, Calling Functions)
Week 12	Handle graphics and user interface. 1.pre-defined dialogs 2. Handle graphics a) Graphics objects b) Properties of objects c) Modifying properties of graphics objects
Week 13	GUI Interface (Attaching buttons to actions, Getting Input, Setting Output) I
Week 14	GUI Interface (Attaching buttons to actions, Getting Input, Setting Output) II
Week 15	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction, MATLAB Environment, MATLAB Windows (Command Window, Workspace Window, Command History window, Help Window, Editor Window).
Week 2	A First Program, Expressions, Constants, Entering Matrices, Useful Matrix Generators, Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns.
Week 3	Variables and assignment statement, logical operator.
Week 4	Arrays, Built in functions, Basic Matrix Functions (sum, max, min, mean, magic, diag, length, size, median, prod, sort).
Week 5	Basic Plotting (Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multi



	Plots in One Figure, Setting Axis Limits).
Week 6	Arguments and return values, M-file, input-output statement
Week 7	Control Statements (Conditional statements: If, Else, Elseif, switch case)
Week 8	Repetition statements: (While statement, For statement)
Week 9	Combination of conditional and repetition statements I
Week 10	Combination of conditional and repetition statements II
Week 11	Procedures and Functions(a custom-made Matlab function, define the name of the function, the input and the output variables, Calling Functions)
Week 12	Handle graphics and user interface. 1.Pre-defined dialogs 2. Handle graphics a) Graphics objects b) Properties of objects c) Modifying properties of graphics objects
Week 13	GUI Interface (Attaching buttons to actions, Getting Input, Setting Output) I
Week 14	GUI Interface (Attaching buttons to actions, Getting Input, Setting Output) II

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to MATLAB for Engineers William J. Palm III	yes
Recommended Texts	INTRODUCTION TO MATLAB FOR ENGINEERING STUDENTS ,David Houcque	
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	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded



(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required

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

د. هارون عبد الكاظم شهد
العميد

عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 23

رئيس القسم : أ.د. محمود شاكر نصر

رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 23

م.م. زينب حسين علي

التاريخ : 2026 / 3 / 23

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Mechanics		Module Delivery	
Module Type	Support		Theory ☐ ☐ Lecture ☐ Lab Tutorial ☐ ☐ Practical ☐ Seminar	
Module Code	MIET 1203			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	UGI	Semester of Delivery		2
Administering Department	Medical Devices Technologies		College	HUC
Module Leader	Ruqayah Nassr Jawad		e-mail	Ruqaya_nasr_jawad@hilla_unc.edu.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	.M.Sc
Module Tutor	Name (if available)		e-mail	E



Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	2026/3/10	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. .To understand mechanics theory through the application of motion 2. .To determine the forces, stress and strain under force effected 3. .To determine the reaction forces under load applied 4. To understand the friction basic under mechanic applied 5. .To understand the newton laws in motion 6. .To understand and solve problems in forces analysis 7. .To determine the materials properties and selective of materials
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. .Identifying the basic of forces results in applications of structures 2. .Identify the basics of Equilibrium force system 3. .Recognize how phenomena motion in mechanic's subject 4. .Summarize what is mean of forces reaction in beams 5. .Explain the analysis force in mechanics application 6. .Identify the basics of stress and strain in mechanical applications 7. .List the various parameters associated with mechanics theory 8. .Identify the basics of forces analysis and their applications 9. .Explain the Newton's laws used in mechanics application 10. .Identify the basics of friction forces in motion 11. Identify the basics of welding and riveted joints in mechanical applications 12. .Explain the mechanical test to determine the mechanical properties 13. Discuss the phenomena of moment of forces under different force moment
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>: Part A</u> 1- Introduction of forces, Analysis of Forces, Result of forces, Moment of forces, Equilibrium force system. [5 hrs] 2- Stress, Strain, stress – strain curve, Simple strain, Variable stress. [6 hrs] 3- Beams and bending, Analysis of structure. [5 hrs] 4- Friction, coefficient of friction, mechanism of friction. [5 hrs] <u>: Part B</u> [Materials properties, material selective, stress- strain diagram. [5 hrs -1

	2- Mechanical tensile test, compression test, impact test, hardness test. [5 hrs] 3- Mechanical joint, Rivet joint, welding connection. [5 hrs] 4- Beams and bending, Analysis of structure, Centroid, Second moment of area. [7 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	:Strategies in mechanical subject like The main strategy that will be adopted in delivering this module is to encourage students to participate in the exercises, while at the same time refining and expanding their mechanical subject thinking development 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 SSWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured USWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	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	12 ,3	LO #1, 2, 10 and 11
	Online Assignments	2	(10) %10	5,9	LO # 3, 4, 6 and 7
	OnSite assignment	2	(10) %10	10 ,6	LO # 5, 6, 8 and 9
	Report	1	(10) %10	14	LO # 2-10
Summative assessment	Midterm Exam	hr 2	(10) %10	8	LO # 1-7
	Final Exam	3hr	(50) %50	16	All
Total assessment			(Marks 100) %100		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
:Week 1	- Introduction to Engineering Mechanics - Basic Concepts and Definitions
:Week 2	Introduction to Statics and Vectors (Part 1) .Course introduction, syllabus, and importance of Statics .Fundamentals of forces, types of forces .Scalars and vectors .Vector addition and subtraction .Vector components and unit vectors
:Week 3	
:Week 4	
:Week 5	Introduction to Statics and Vectors (Part 2) .Resultant of force systems (graphical method) .Resultant of force systems (analytical method) .Moments of forces (torque) .Conditions for equilibrium .Free-body diagrams and solving equilibrium problems
:Week 6	
:Week 7	Stress, Strain, and Material Properties (Part 1) .Stress and types of stress .Strain and types of strain .Hooke's Law and material properties .Stress-strain diagrams .Thermal stress and strain
:Week 8	
:Week 9	Stress, Strain, and Material Properties (Part 2) .Simple strain and deformation .Stress and strain transformations .Shear and axial deformation .Review and applications of stress and strain .Assignment on stress and strain analysis
:Week 10	
:Week 11	Second Moment of Area and Structural Analysis (Part 1) .Geometric properties of shapes

:Week 12	.Centroids and center of mass .Second moment of area (moment of inertia) .Bending stress in beams .Shear stress in beams
:Week 13	Second Moment of Area and Structural Analysis (Part 2) .Shear and moment diagrams .Introduction to beams and types of loads .Determining reactions in statically determinate structures .Truss analysis .Frame analysis
:Week 14	Friction .Friction coefficient .Type of friction .Mechanism of friction Stress Concentration, Fatigue, and Special Topics .Review of special topics .Comprehensive review of the course material .Final exam or project presentations. Course evaluation and .feedback
:Week 15	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the ?Library
Required Texts	Engineering Mechanic's Statics, 12th Edition by R. C. -1 .Nibbler, 1995	Yes
Recommended Texts	Engineering Mechanic's Statics, 7th Edition by James, -2 .L .Meriam, L. G Kraige, 1995	No
Websites		

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



عميد الكلية : أ.د. هارون عبد الكاظم شهد

رئيس القسم : أ.د. محمود شاكر نصر

اسم التدريسي: م.م رقيه نصر جواد

التاريخ : 2026 / 3 / 10

التاريخ : 2026 / 3 / 10

التاريخ : 2026 / 3 / 10

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Engineering Workshops	Module Delivery
Module Type	Support	☐ Theory ☐ Lecture ☒ Lab ☐ Tutorial
Module Code	EETC1001	
ECTS Credits	5	



SWL (hr/sem)	125	☐ Practical ☐ Seminar	
Module Level	UGI	Semester of Delivery	2
Administering Department	MIET	College	Faculty of Engineering Techniques
Module Leader	Ruqia Nasr	e-mail	Ruqia@gmail.com
Module Leader's Acad. Title	Assist. lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Ruqia Nasr	e-mail	
Peer Reviewer Name	Ruqia Nasr	e-mail	
Scientific Committee Approval Date	10/3/2026	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	1. To explain the lathe workshop: various measuring devices and how to use them. How to operate the lathe and use different tools and cutting tools. 2. To explain the welding and gas welding processes and familiarize yourself with the devices and equipment used. Point welding, familiarization with the devices and equipment used, and carrying out a simple exercise. 3. To understand the electrical transformers and their types: magnetic circuits; electrical circuits; measuring the wire diameters of the transformer. 4. To understand the drawing of a circuit for establishing (the lamp ladder) two roads using a two-way switch—a practical application of the circuit. 5. To learn how to use the different measuring devices in the workshop.



	a multimeter, oscilloscope, etc.). 6. To learn how to use caustics, soldering irons, and various printed electronic circuits, identify how to install them, and install various electronic components on them. 7. To understand different types of coils and methods of checking them. Different types of capacitors differ in terms of the type of insulator used between the capacitor plates and the methods of checking them. The different types of resistors, in terms of the material they are made of and the capacity they can withstand, How to read the values of the resistors in different ways Variable and special resistors: how to check them. 8. To understand the different types of switches used in electronic devices and their examination methods. Different types of fuses There are different types of resistors in terms of the material they are made of. Types of semiconductor diodes and transistors and finding the equivalents Semiconductor check, diode check, and transistor check. 9. To understand how to read the electronic map and how to track faults on the electronic map How to install and solder electronic components on the printed board Implementation of a simple electronic circuit on the printed board integrated electronic circuits: identify the types of these circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the course, students should be able to: 1. Recognize the methods of work on the lathe. 2. Cuts metals with a cutting and punching machine. 3. Install some simple structures. 4. Providing the student with manual experience and scientific proficiency in it. 5. Learn about electronic components. 6. Electronic components exchange is used to build and solder simple circuits. 7. Examine electronic circuits and their components. 8. Read the electronic map and learn how to track faults on the electronic map. 9. How to install and solder electronic components on the printed board. 10. Implementation of a simple electronic circuit on the printed board. 11. Removing solder from circuits for the purpose of lifting and replacing. 12. How to design electronic circuits on the printed board. 13. Methods of soldering integrated circuits.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Lathe workshop, measuring devices, different tools, cutting tools, welding, gas welding, and point welding. [7 hrs.]. Electrical transformers, magnetic circuit, and electrical circuits. [6 hrs.]. Different measuring devices in the workshop (such as an ovometer, oscilloscope, power supply, etc.) [8 hrs.]. Soldering iron and printed electronic circuits [4 hrs.]. Coils, capacitors, and resistors [6 hrs.].



	Switches and fuses [4 hrs.]. Semiconductor diode, and transistor [6 hrs.]. Electronic map, faults on the electronic map, and design electronic circuits on the printed board [8 hrs.]. Implemented a simple electronic circuit on the printed board [4 hrs.]. Integrated electronic circuits [4 hrs.].
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Daily assessment - weekly assessment - quarterly assessment - objective questions - general questions - practical tests.
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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 أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 8	LO # 1-2 and 4-6
	Assignments	2	10% (10)	9, 13	LO # 3 and #4
	Projects / Lab.	8	15% (10)	Continuous	
	Reports	1	5% (10)	6	LO # 7
Summative assessment	Midterm Exam	2 hr.	10% (10)	8	LO # 1-7
	Final Exam	3 hr.	50% (50)	15	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Lathe workshop: various measuring devices and how to use them. How to operate the lathe and use different tools and cutting tools
Week 2	Lab 2: Welding and gas welding, and familiarization with the devices and equipment used. Point welding, familiarization with the devices and equipment used, and carrying out a simple exercise.
Week 3	Lab 3: Electrical transformers: their types magnetic circuits; electrical circuits; opening transformers; taking information from the old transformer for primary and secondary coils measuring the wire diameters of the transformer; measuring the plastic coil template rewinding primary and secondary coils.
Week 4	Lab 4: Drawing a circuit for establishing two roads using a two-way switch is a practical application of the circuit. Identifying electrical collectors-their types, their use, thermal follow-ups, and time position.
Week 5	Lab 5: Training on making electrical installations (establishing inside tubes).Pipe cutting process: dental work, pipe bending, using drag springs.
Week 6	Lab 6: How to use the different measuring devices in the workshop (such as a multimeter, oscilloscope, etc.).
Week 7	Lab 7: How to use caustics: types of caustics used in the workshop; caustic welding training. Types of solder used: auxiliary materials for soldering; soldering some wires with each other and with some components. How to use a soldering iron and a soldering absorbent kit such as a solder sucker or solder remover, training on some electronic components, and lifting them from the printed plate. Various printed electronic circuits, identifying how to install them, and the installation of various electronic components on them. Lab 8- Coil types, methods of checking them, electrical transformers, types, checking, auto-transformer, the difference between an auto-transformer and an ordinary transformer. The different types of capacitors in terms of the type of insulator used between the capacitor plates, the effort that the capacitor bears, and reading the values of the capacitors using the different methods used in coding How to check the amplifiers and how to switch them. Making connections of the capacitors in parallel, series, and mixed on the printed board with the examination.
Week 8	Midterm- Exam
Week 9	Lab 9: The different types of switches used in electronic devices and their examination



	methods, the current that each switch bears, and the use of each type. Types of fuses used in electronic circuits, types and diameters of wires used and diameters of wires used in fuses, the current that each type bears, and how to repair fuses
Week 10	Lab 10: The different types of resistors, in terms of the material they are made of and the capacity they can withstand, How to read the values of the resistors in different ways Variable and special resistors (VDR-PYC-NTC) how to check them. Make a circuit to connect the resistors in series, make a circuit to connect the resistors in parallel, make a circuit to connect the resistors in series and parallel, and check the circuit.
Week 11	Lab 11: Types of semiconductor diodes and transistors and finding the equivalents. Semiconductor check, diode check, transistor check
Week 12	Lab 12: How to read the electronic map and track faults on the electronic map. Introduce the student to how to design electronic circuits on the printed board.
Week 13	Lab 13: How to install and solder electronic components on the printed board. Implementation of a simple electronic circuit on the printed board.
Week 14	Lab 14: Integrated electronic circuits: identify the types of these circuits. Caution for soldering integrated circuits, the correct method of soldering integrated circuits, and removing solder from circuits for the purpose of lifting and replacing.
Week 15	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Recommended Texts	1- Encyclopedia of Electronic Components Volume 1 (Charles Platt). 2- Encyclopedia of Electronic Components Volume 2 (Charles Platt). 3- Encyclopedia of Electronic Components Volume 3 (Charles Platt). 4- Encyclopedia of Electronic Components Volume 4 (Charles Platt). 5- Encyclopedia of Electronic Components Volume 5	NO 

	(Charles Platt).	
Websites	https://www.electricaltechnology.org/2013/03/how-to-remember-direction-of-pnp-and.html	

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

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



عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 10



رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 10




اسم التدريسي: م.م رقيه نصر جواد

التاريخ : 2026 / 3 / 10



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Integral Mathematics		Module Delivery	
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET1204			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGI	Semester of Delivery		2
Administering Department	MITE	College	EETC	
Module Leader	MS.c. Sajdeen K. Dawood		e-mail	Sajdeen.k@s.uokerbala.edu.iq
Module Leader's Acad. Title	Master		Module Leader's Qualification	MS.c.
Module Tutor	MS.c. Sajdeen K. Dawood		e-mail	Sajdeen.k@s.uokerbala.edu.iq
Peer Reviewer Name	Sajdeen K. Dawood		e-mail	Sajdeen.k@s.uokerbala.edu.iq
Scientific Committee Approval Date	22/3/2026		Version Number	2.0

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	Differential Mathematics		Semester	1
Co-requisites module	None		Semester	



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of Integral calculus through a broad range of Integration techniques. 2. To understand theory and methods of integrations and apply it on various types of functions. 3. This is the basic subject for all engineering fields 4. Demonstrate basic knowledge and understanding of a core of linear algebra and applied mathematics. 5. Introduce student to integration of trigonometric functions and their inverses.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify the integration. 2. Interpret definite and indefinite integrals. 3. Integrate functions resulting in inverse trigonometric functions. 4. Integrate functions involving exponential and logarithmic functions. 5. Learn approximation techniques for integration. 6. Calculate the areas of curved regions by using integration methods. 7. Find the volume of a solid of revolution using various integration methods. 8. Learn how to find the length of a plane curve for a given function. 9. Teaching students how to calculate the inverses of matrices and how to identify them. 10. Teaching students how to find the solution of a homogeneous system of linear equations. 11. Teaching students how to find the eigenvalues of a matrix and the corresponding eigenvectors of a matrix. 12. Determine the diagonalizability of a given matrix.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introduction to integration. Methods of integration and Basics of Definite and indefinite Integration, Integration of trigonometric and inverse functions. Integration of the exponential functions, Integration of logarithmic functions. Integration of Hyperbolic and inverse hyperbolic functions, numerical integration and applications of the definite integrals. [30 hrs] Area of surface, Volume of revolution, Length of plane curve, Matrices and Inverse of matrix, Matrix Diagonalization Solution of homogeneous systems, Eigenvalues, and Eigenvectors [40 hrs] Revision problem classes [3 hrs]



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. Classes and interactive lessons will be used to achieve this.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 12	LO #1- #4 and #6 - #12
	Online assignments	2	10% (10)	3 and 13	LO #1- #4 and #6 - #12
	Report	1	10% (10)	14	LO #1- #6 and #8 - #11
	OnSite assignment	1	10% (10)	4 and 11	LO #1- #9
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #5
	Final Exam	3hr	50% (50)	16	LO #1- #12
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to integration.
Week 2	Methods of integration and Basics of Definite and indefinite Integration.
Week 3	Integration of trigonometric and inverse functions.
Week 4	Integration of the exponential functions.
Week 5	Integration of logarithmic functions.
Week 6	Integration of Hyperbolic and inverse hyperbolic functions.
Week 7	Mid-term Exam + numerical integration and applications of the definite integrals.
Week 8	Area of surface.
Week 9	Volume of revolution.
Week 10	Length of plane curve.
Week 11	Matrices and Inverse of matrix.
Week 12	Matrix Diagonalization
Week 13	Solution of homogeneous systems
Week 14	Eigenvalues and Eigenvectors
Week 15	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Notes on Calculus II Integral Calculus Miguel A. Lerma	No
Recommended Texts	Thomas ' Calculus (pdf) Fouteenth edition Based on the original work by GEORGE B. THOMAS, JR.	No
Websites	https://sites.math.northwestern.edu/~mlerma/courses/math214-2-02f/notes/c2-all.pdf http://dl.konkur.in/post/Book/Paye/Thomas-Calculus-14th-Edition-%5Bkonkur.in%5D.pdf	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance



(50 - 100)	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.



عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 22

رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 22

اسم التدريسي: م.م ساجدين كاظم داود

التاريخ : 2026 / 3 / 22

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Medical physics	Module Delivery
Module Type	Support	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MIET1202	
ECTS Credits	5	
SWL (hr/sem)	125	



Module Level	UG1	Semester of Delivery	2
Administering Department	Medical Devices	College	College of Engineering Techniques
Module Leader	Uday Ghani Abood	e-mail	
Module Leader's Acad. Title	Prof.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Uday Ghani Abood	e-mail	
Scientific Committee Approval Date	8/11/2023	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- to recognize the influence of forces on the human body Identify how the skeleton works 2- to show how pressure affects the body's organs Recognize physical activity of the lungs and breathing 3- to demonstrate the physics of the cardiovascular system and the urinary system 4- to distinguishes the basic principles using the applications of electricity and magnetism in medicine 5- to shall be acquainted with respiratory, cardiovascular and cardiovascular equipment 6- to distinguishes the basic principles, using the sound waves in medicine and the use of x-rays in the diagnosis and identification of diseases
Module Learning	Upon completion of the course, students should be able to:



Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the difference between the Forces. 2- Know the bone has at least six functions. What are the main components of the bone, and to study the methods of Measurement the minerals quantity in the bone 3- know methods of diathermy 4- understand how Energy change in the body 5- know pressures inside the body parts and measure it 6- understand how to work the lungs and How the blood and lungs interact 7- know nervous system and the neuron 8- know the graphing devices of the body organs 9- know the applications of Electricity and Magnetism in Medicine 10- know the application of sound in medicine, know sonar devices 11- know the application of light and laser in medicine 12- know Major components of the cardiovascular system 13- know physics of nuclear medicine 14- know the x- ray device
Indicative Contents المحتويات الإرشادية	1- Define the Forces , Frictional Forces , Dynamics (5hrs) 2- functions of the skeleton and Bone consists of quite different materials and how to measure mineral in the bones (5 hrs) 3- Types of thermometers , Heat therapy, Cryogenics (5 hrs) 4- Sphygmomanometer, blood pressure, bladder pressure , tonometer(4hrs) 5- Function of Lungs & Breathing, breath rate, airways, Dalton's law of partial pressures(3hrs) 6- The nervous system and the neuron, Electrocardiogram, Electro retion gram (ERG), The magneto cardiogram (MCG)(4hrs) 7- Magnetic signals from the heart –magneto cardiogram(3hrs) 8- Macro shock, Micro shock (3hrs) 9- General Properties of Sound, Acoustic Impedance, Absorption, A-mode Display, Doppler Ultrasound(5hrs) 10- Endoscope, cystoscopes, Emissive IR photography. (5hrs) 11- Laser, population inversion, X-ray (6hrs) 12- Physics of the cardiovascular system (5 hrs)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Daily assessment - weekly assessment - quarterly assessment - objective questions - general questions - practical tests.
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Student Workload (SWL)					
الحمل الدراسي للطالب					
Structured SWL (h/sem)		64	Structured SWL (h/w)		4
الحمل الدراسي المنتظم للطالب خلال الفصل			الحمل الدراسي المنتظم للطالب أسبوعيا		
Unstructured SWL (h/sem)		61	Unstructured SWL (h/w)		4
الحمل الدراسي غير المنتظم للطالب خلال الفصل			الحمل الدراسي غير المنتظم للطالب أسبوعيا		
Total SWL (h/sem)		125			
الحمل الدراسي الكلي للطالب خلال الفصل					
Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4, 11	LO # 1-3 and 8-10
	Assignments	2	10% (10)	9, 13	LO # 8 and 11-12
	Projects / Lab.	7	10% (10)	Continuous	
	Report	2	10% (10)	7, 12	LO # 1-6 and 7-11
Summative assessment	Midterm Exam	2 hr.	10% (10)	7	LO # 1-7
	Final Exam	4 hr.	50% (50)	14	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Forces on and in the body.
Week 2	Physics of the skeleton.
Week 3	Heat & cold in medicine
Week 4	Energy, work and power of the body, Pressure in body organs
Week 5	Physics of the lungs and breathing.
Week 6	Physics of cardiovascular system
Week 7	Mid Term Exam
Week 8	Physics of urinary system.
Week 9	Electricity within the body.
Week 10	Sound in medicine and physics of hearing.
Week 11	Light in medicine and physics of vision.



Week 12	Diagnostic X-rays
Week 13	Physics of nuclear medicine (radioisotopes in medicine).
Week 14	Physics of radiation therapy+ Radiation protection
Week 15	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to laboratory tools
Week 2	Lab 2: the simple pendulum
Week 3	Lab 3: hook's law
Week 4	Lab 4: the blood pressure
Week 5	Lab 5: the friction
Week 6	Lab 6: the speed of sound
Week 7	Lab 7: the laser
Week 8	Lab 8: viscosity of liquids
Week 9	Lab 9: The cylindrical body
Week 10	Lab 10: The convex lens
Week 11	Lab 11: the concave lens

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Recommended Texts	Introductory Physics I Elementary Mechanics by Robert G. Brown	NO
Websites	https://webhome.phy.duke.edu/~rgb/Class/intro_physics_1/intro_physics_1.pdf	

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

	Satisfactory			
	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.

أ.د. هارون عبد الكاظم شهد
الحمد



أ.د. محمود شاكر نصر

Hamadi

عميد الكلية : أ.د. هارون عبد الكاظم شهد

رئيس القسم : أ.د. محمود شاكر نصر

اسم التدريسي أ.د. عدي غني عبود

التاريخ : / 3 / 25

التاريخ : 2026 / 3 / 25

التاريخ : 2026 / 3 / 25

2026



Second stage

UGII



Level 2 – First semester

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Anatomy & Physiology		Module Delivery
Module Type	Support or related learning activities		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical Seminar
Module Code	MIET2105		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGII	Semester of Delivery	
Administering Department	MIET	College	Engineering Techniques Eng.
Module Leader	M.Sc. Hwaraa M.	e-mail	Hawraa@yahoo.com
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	M.Sc. Hwaraa M.	e-mail	Hawraa@yahoo.com
Scientific Committee Approval Date	20/3/2026	Version Number	1.0

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



Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1-Anatomy and Physiology are important medical discipline to understand structures and functions of human body cells, tissues, organs, organ systems, and as a whole system, how it works and the relationships between body parts. 2- This mode unit consists of main elements of anatomy and physiology, the terminology used, and how our body control itself. 3- Students will be able to understand how medical device work with the human body and what the benefit from it. 4- To understand the level of organization of the human organism and the homeostatic system. 5- To understand the chemical structure, chemical reactions and their control with acid-base balance in human body.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate correct usage of the terminology used to describe anatomical structures. 2. Describe the organization of cells and tissues. 3. Describe the principles relating to the structure of connective tissues, skeletal muscle, bones, and joints. 4. Describe the principles of excitable tissues. 5. Describe the structure and function of the human eye and ear and the mechanisms of vision and hearing. 6. Describe the principles of sensorimotor control. 7. Describe cardiac mechanics and cardiac biophysics. 8. Develop quantitative descriptions of physiological properties and systems. 9. Describe the application of technologies and techniques for investigating the structure and function of the body. 10. Demonstrate communication skills (oral and written) to describe the structure and function of the human body. 11. Describe basic structural and functional features of the major organ systems within the human body. 12. Define basic biological processes essential for maintenance of homeostasis. 13. Correlate specific structural features of human cells, tissues, o



	changes that occur during human development, ageing and disease.
Indicative Contents المحتويات الإرشادية	Topics include: - Anatomical terminology (5 hrs). - The structure and appearance of cells and tissues (6 hrs). - The appearance of bone and cartilage, the organization of dense connective tissues (6 hrs). - Skeletal muscle structure and function. Principles of excitable tissues. [15 hr] - The structure and function of sensory systems, including the eye and vision and the ear and hearing. - Principles of sensory motor control. Cardiac mechanics and cardiac biophysics.[10 hr] - Multiscale modelling of physiological systems (6 hrs). - Technologies, quantitative measurements and experimental techniques used to investigate the structure and function of different tissues, organs and organ systems. [15 hr]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The learning and teaching strategies employed in this module can vary depending on the specific course. However, here are some common strategies that may be used with this course: <u>Teaching methods include:</u> - lectures - seminars - tutorials - lab experiments - design assignments. - industrial visits - professional training - a variety of projects <u>Assessment :</u> methods of assessment include a combination of: - coursework - group project reports - lab reports



- written exams.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2
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	4	20%	2,4,6, 8, 10, 12	LO : 1,2,3.....14
	Assignments	2	5%	7, 10	LO : 6, 13
	Projects / Lab.	2	5%	5, 9	LO : 1-5, 6-9
	Report	1	10%	11	LO : 1,2,312
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO : 1-7
	Final Exam	4 hr	50 % (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Introduction to Anatomy and Physiology.
Week 2	The Chemical level of Organization.
Week 3	The Cell level of Organization
Week 4	The Tissue level of organization
Week 5	The Integumentary system
Week 6	The Muscular system
Week 7	Mid Exam



Week 8	The Skeletal System
Week 9	The Central Nervous System
Week 10	The Peripheral Nervous System and Autonomic Nervous System.
Week 11	The Sense and Sensory System.
Week 12	The Endocrine System.
Week 13	The Cardiovascular System: The Heart, Blood Vessels And Blood.
Week 14	The Respiratory System. The Urinary System.
Week 15	Preparatory week before final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1 measurement of body temperature
Week 2	Lab 2 Coagulation
Week 3	Lab 3 The blood
Week 4	Lab 4 Membrane transport
Week 5	Lab 5 Complete blood count
Week 6	Lab 6 Hemoglobin (Hb) Determination
Week 7	Lab 7 Erythrocyte Sedimentation Rate ESR
Week 8	Lab 8 Total leucocyte count
Week 9	Lab 9 Total Red Blood Cell R B C count
Week 10	Lab 10 Platelets count
Week 11	Lab 11 Blood film
Week 12	Lab 12 Blood group
Week 13	Lab 13 Blood sugar
Week 14	Lab 14 Blood urea & Blood pressure



Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Frederic H Martini, Edwin F Bartholomew, William C. Ober, Claire W. Garrison, Kathleen Welch, & Ralf T Hutchings (2007), <i>Essentials of Anatomy and Physiology</i> , 14 th edn, Pearson Education, San Francesco, USA.	No
Recommended Texts	1- Human Physiology Study Guide 2- Human Anatomy & Physiology: Help and Review	
Websites	Interactive physiology, Copyright © 2005 Pearson Education, Inc. publishing as Benjamin	

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

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

أ.د. هارون عبد الكاظم شهد
عميد الكلية

عميد الكلية : أ.د. هارون عبد الكاظم شهد

أ.د. محمود شاكر نصر
رئيس القسم

رئيس القسم : أ.د. محمود شاكر نصر

أ.م. حوراء محمد
اسم التدريسي

اسم التدريسي: م.م. حوراء محمد



التاريخ : 2026 / 3 / 20

التاريخ : 2026 / 3 / 20

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer applications		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MTU1005		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII 2	Semester of Delivery	3
Administering Department	MIET	College	EETC
Module Leader	Dr.Hayder Kareem Algabri	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Dr.Hayder Kareem Algabri	e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	15/3/2026	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 Introduction to Networking To establish a fundamental understanding of how data moves across digital landscapes, focusing on the theoretical models (OSI/TCP-IP) that underpin global connectivity. 2 Networking Devices To bridge theory with hardware by providing hands-on conceptual knowledge of the physical and logical components (switches, routers, media) required to build a functional network. 3 Introduction to Security To instill a "security-first" mindset by introducing the CIA Triad and the landscape of digital threats that challenge modern information systems. 4 Security To move beyond theory into defense, equipping students with the technical strategies (encryption, firewalls, and access control) needed to protect data and infrastructure. 5 E-Commerce To explore the intersection of technology and business, focusing on the secure architectures and payment systems that enable global digital trade. 6 Computer Troubleshooting To develop a systematic, analytical approach to problem-solving, moving from "trial-and-error" to a structured methodology for hardware and software recovery. 7 Introduction to AI To demystify Artificial Intelligence by defining its core concepts, historical evolution, and the fundamental differences between simple automation and machine learning. 8 AI in Our Daily Lives To raise awareness of the "invisible" AI integrated into modern society, from recommendation engines to personal assistants, and how they impact consumer behavior. 9 Applications of AI-1 To explore the frontier of Generative AI and Natural Language Processing (NLP), focusing on how machines understand, generate, and manipulate human language. 10 Applications of AI-2 To investigate Computer Vision and Robotics,



	focusing on how AI perceives the physical world through sensors and interacts with it via autonomous movement. 11 Applications of AI-3 To examine the role of Expert Systems and Predictive Analytics in high-stakes professional fields like healthcare, finance, and industrial optimization. 12 AI Society To analyze the socio-economic transformations driven by AI, specifically regarding the future of the workforce, education, and social interactions. 13 Ethical Challenges in AI To foster critical thinking regarding the moral implications of AI, including algorithmic bias, data privacy, and the "black box" of machine decision-making. 14 The Future of AI To synthesize current trends to forecast the trajectory of AI, debating the possibilities of AGI (General Intelligence) and the necessity of long-term AI safety.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Following the established aims, here are the Learning Outcomes for each module. These are designed to be measurable, ensuring that students can demonstrate both their theoretical grasp and practical competencies across networking, security, and AI. Section 1: Networking & Security 1. Introduction to Networking • L01: Distinguish between different network types (LAN, WAN, MAN) and physical topologies. • L02: Map data flow accurately across the layers of the OSI and TCP/IP models. • L03: Explain the fundamental principles of packet switching and circuit switching. 2. Networking Devices • L01: Identify and describe the function of Layer 1, 2, and 3 devices (Hubs, Switches, Routers). • L02: Select appropriate transmission media (Fiber, Copper, Wireless) based on distance and bandwidth requirements. • L03: Demonstrate the ability to perform basic configuration on a network switch or wireless access point. 3. Introduction to Security • L01: Define and apply the CIA Triad (Confidentiality, Integrity, Availability) to real-world scenarios. • L02: Categorize various digital threats, including malware, phishing, and denial-of-service (DoS) attacks. • L03: Recognize the importance of "Security by Design" in system



	development. 4. Security • L01: Implement essential defense mechanisms, including firewalls, ACLs, and VPNs. • L02: Compare symmetric and asymmetric encryption and their roles in securing data in transit. • L03: Execute a basic vulnerability assessment to identify potential weak points in a network. Section 2: Systems & Troubleshooting 5. E-Commerce • L01: Analyze the technical infrastructure required to support B2B, B2C, and C2C business models. • L02: Evaluate the security protocols (SSL/TLS, PCI-DSS) necessary for safe online transactions. • L03: Understand the role of APIs and databases in managing digital storefronts. 6. Computer Troubleshooting • L01: Apply a standardized 6-step troubleshooting methodology to resolve technical issues. • L02: Diagnose and repair common hardware failures related to RAM, storage, and power. • L03: Utilize system logs and diagnostic tools to identify OS-level software conflicts. Section 3: The AI Curriculum 7. Introduction to AI • L01: Articulate the difference between Narrow AI, General AI, and Machine Learning. • L02: Summarize the key milestones in AI history and their impact on current technology. • L03: Identify the core components of an "Intelligent Agent." 8. AI in Our Daily Lives • L01: Critique the influence of recommendation algorithms on user behavior and privacy. • L02: Identify AI integration in common consumer products like : homes and navigation apps.
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	• L03: Explain how data collection feeds the cycle of AI personalization. 9. Applications of AI-1 (NLP & Generative AI) • L01: Demonstrate effective prompt engineering to generate structured text and code. • L02: Explain the basic architecture of Large Language Models (LLMs). • L03: Identify the risks of AI hallucinations and misinformation in generated content. 10. Applications of AI-2 (Computer Vision & Robotics) • L01: Describe the process of feature extraction in image recognition. • L02: Analyze how robots use sensor fusion to navigate dynamic environments. • L03: Evaluate the safety and efficiency of autonomous systems in industrial settings. 11. Applications of AI-3 (Expert Systems & Analytics) • L01: Compare rule-based expert systems with modern data-driven predictive models. • L02: Explain how AI identifies patterns in financial fraud detection and medical diagnostics. • L03: Understand the value of "Big Data" in training high-accuracy predictive systems. Section 4: Ethics & Future Impact 12. AI Society • L01: Assess the impact of automation on the global labor market and identify "future-proof" skills. • L02: Discuss how AI can either bridge or widen the digital divide between different populations. • L03: Evaluate the role of AI in personalizing education and training. 13. Ethical Challenges in AI • L01: Detect and mitigate bias within training datasets and algorithmic outputs. • L02: Debate the trade-offs between AI convenience and individual privacy/surveillance. • L03: Apply ethical frameworks to determine accountability in AI-driven decision-making. 14. The Future of AI • L01: Speculate on the societal implications of reaching Artificial
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	General Intelligence (AGI). LO2: Identify emerging technologies, such as Quantum AI, that may redefine the field. LO3: Formulate a personal or organizational stance on AI safety and alignment protocols.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	To effectively deliver this curriculum, the pedagogical approach should shift from theoretical instruction to active, project-based learning. In the Networking and Security sections, strategies should focus on simulated environments (using tools like Cisco Packet Tracer) and "sandbox" troubleshooting labs where students can safely break and fix systems. For the E-Commerce and AI modules, the strategy should emphasize case-study analysis and interactive prompt-engineering workshops, allowing students to transition from passive consumers to active creators. Finally, the societal and ethical components are best served through structured debates and "Ethics Red-Teaming," where students must argue multiple perspectives on AI governance, ensuring they develop the critical thinking skills necessary for an AI-integrated workforce.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	49	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	26	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 8 and 9
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 a
	Projects / Lab. Report	1	10% (10)	Continuous	All
		1	10% (10)	14	LO # 1-14
Summative	Midterm Exam	2 hours	10% (10)	7	LO # 1-7



assessment	Final Exam	4 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Networking
Week 2	Networking
Week 3	Introduction to Security
Week 4	Security
Week 5	E-Commerce
Week 6	Computer Troubleshooting
Week 7	Introduction to AI
Week 8	AI in our daily lives
Week 9	Applications of AI-1
Week 10	Applications of AI-2
Week 11	Applications of AI-3
Week 12	AI Society
Week 13	Ethical challenges in AI
Week 14	The future of AI
Week 15	Preparation for the final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Introduction to Lab Environment and Office Suite - Lab setup and software installation. Overview of Microsoft Office Suite tools and features.
Week 2	Microsoft Word Lab - Creating, editing, and formatting documents. Inserting and formatting images and tables.
Week 3	Microsoft Excel Lab - Creating spreadsheets and entering data. Formulas and functions for calculations.
Week 4	Microsoft PowerPoint Lab - Creating, editing, and designing slides. Adding multimedia elements and animations.
Week 5	Word Processing Techniques Lab - Mail merge and document collaboration exercises. Creating professional documents with advanced formatting.
Week 6	Data Analysis Lab with Excel - Advanced formula and function exercises. Sorting, filtering, and analyzing data.
Week 7	Presentation Design Lab with PowerPoint - Applying design principles to create visually appealing slides. Adding interactive elements and customizing slide



	layouts.
Week 8	• Collaboration and Sharing Lab - Collaborative document editing and reviewing. Sharing and protecting documents with permissions.
Week 9	• Automation and Customization Lab - Recording and running macros for repetitive tasks. Customizing the ribbon and creating shortcuts.
Week 10	• Integrating Office Applications Lab - Linking and embedding data between Word, Excel, and PowerPoint. Importing and exporting data between applications.
Week 11	• Advanced Tips and Tricks Lab - Exploring time-saving techniques and productivity hacks. Troubleshooting common issues and errors.
Week 12-15	• Project-based Labs - Students work on individual or group projects that integrate Word, Excel, and PowerPoint skills. Projects can involve tasks such as creating a professional report, analyzing data, or designing an interactive presentation.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	M. E. Vermaat, S. M. Freund, C. Hoisington, and E. Schmieder, "Microsoft Office 365 & Office 2019: Introductory," Boston, MA: Cengage Learning, 2020.	Yes
Recommended Texts	Triad Interactive, Inc., "Microsoft Office 2019: A Skills Approach," Boston, MA: Cengage Learning, 2019.	Yes
Websites	The Collage E-Library	



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

أ.د. هارون عبد الكاظم شهيد
العميد

عميد الكلية : أ.د. هارون عبد الكاظم شهيد
التاريخ : 2026 / 3 / 15

رئيس القسم : أ.د. محمود شاكر نصر

رئيس القسم : أ.د. محمود شاكر نصر
التاريخ : 2026 / 3 / 15

أ.د. حيدر كريم

اسم التدريسي: م.د. حيدر كريم
التاريخ : 2026 / 3 / 15

ملاحظة:

تم تغيير المحتوى الخاص بالمادة استنادا الى كتاب الوزارة 11009 في 2024/10/9
والذي يقضي بتغيير محتوى هذه المادة الى موضوع الانكفاء الاصطناعي AI وبناءا عليه
تم تغيير محتوى المادة.



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Electrical Machines		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET2103			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGII	Semester of Delivery		3
Administering Department	MIET	College	EETC	
Module Leader	Thamer Mohammed Hunain		e-mail	Thamer_mohammed @hilla-unc.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Thamer Mohammed Hunain		e-mail	Thamer_mohammed @hilla-unc.edu.iq
Scientific Committee Approval Date	26/3/2026		Version Number	1.0

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	Fundamentals of Electrical Engineering (AC)		Semester	UGI-S2
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- Study engineering concepts and their applications for electrical machines and transformers. 2- How electrical transformers work, how to connect them, and solve mathematical problems related to them and their types. 3- What are electrical machines and what are their classifications. 4- Knowledge and understanding of the basics of laws related to electrical technology materials. 5- Solve issues and issues and apply the rules of application related to electrical engineering. 6- Giving students confidence and ability to use mathematical foundations in applications on generators, electric motors. 7- Building interactive skills that help classify information and make engineering decisions. 8- Develop proposals and alternatives for electrical parts for medical devices
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Learn how transformers work in electrical circuits. 2. List the various terms associated with electrical circuits and machines. 3. Summarize what is meant by electrical transformers and basic electrical machines of all kinds. 4. Discuss the interaction and participation of the number of windings, wire diameter and size of electrical transformers. 5. Description of electrical transformers, motors and generators with direct current and alternating current. 6. Determine the laws related to electrical transformers and their derivations. 7. Identify the equivalent circuits of electrical transformers and methods of calculating their efficiency. 8. Discuss the processes that lead to losses in transformers and electrical machines, and ways to reduce them and increase their efficiency. 9. Discuss the different characteristics of engines and generators, their main components, and the functioning of each. 10. Explain the two laws of machines and determine their efficiency, capacity and torque, and the laws of their formation. 11. Identify the relationship of transformers and electrical machines to medical devices. 12. Discuss the systems of connecting machines, ways of wrapping coils inside them, and the benefits of each. 13. Determining how to increase the efficiency of motors used in medical d methods of maintaining and repairing them.



	14. Describe the types of motors included in the formation of medical devices and their classification
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Single-phase electrical transformers Types of electrical transformers, their parts and components, their equivalent circuit, types of losses, how to calculate them, and how to calculate transformer efficiency through mathematical operations and efficiency laws. [10 hours] Part B - Three-phase electrical transformers Types of three-phase electrical transformers, calculating their cost, types of connections in their files, calculating their equivalent circuits, and deriving special laws for each connection [13 hours] Part C- Electromagnetic and electromechanical induction and the relationship between them and linear motion using those concepts and applications on linear motion and how to generate it. [10 hours] Part D- The electromotive force of single-phase machines, methods of generating them, their laws, and their calculation through mathematical issues and calculating currents, voltages, losses, and capacity. [10 hours] Part E- The electromotive force of the three-phase machines, methods of generating them, their laws, and their calculation through mathematical problems, types of coil connections, testing those machines, and calculating currents, voltages, losses, and real and apparent power. [15 hours] Instantaneous power and average power of alternating current, relative and apparent power. Types of electric motors and how they work [5 hours] Review problem categories [6 hours]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in the delivery of this unit is to students to participate in the exercises, while improving and expanding their thinking skills at the same time. This will be achieved through classes and interactive 

	tutorials and by looking at the types of simple experiments that include some of the electrical wiring activities in the laboratory curriculum that develop students' skills.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	% (10)	5,12	1-3 , 4-10
	Assignments	4	% (10)	4,6,8,12	2-3, 4-5, 6-7, 8-11
	Projects / Lab.	1	% (15)	14	1-12
	Report	5	% (5)	3,5,7,9,11	1-2, 3-4, 5-6, 7-8, 9-10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	1-5
	Final Exam	4 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Transformers : single phase transformer and construction
Week 2	Transformers : single phase transformer and construction
Week 3	Theory of operation, no load and short circuit test.
Week 4	Equivalent circuit, auto-transformers, instrument transformers
Week 5	Equivalent circuit, auto-transformers, instrument transformers
Week 6	Three phase transformers, constructions methods of connection.
Week 7	Mid exam + Three phase transformers, constructions methods of connection.
Week 8	Electromechanical energy conversion principles relay operation.
Week 9	Electromechanical energy conversion principles relay operation.
Week 10	Motor characteristics, testing, calculation of losses and efficiency.
Week 11	Induction machines: equivalent circuit, basic equation, simple analysis testing.
Week 12	Single phase induction motor, methods of starting, split phase, capacitor start, capacitor run and shaded pole motors.
Week 13	Single phase induction motor, methods of starting, split phase, capacitor start, capacitor run and shaded pole motors.
Week 14	Synchronous machines, generators and motors, equivalent circuit, basic equation.
	Special machines: Reluctance motor , hysteresis motor , linear motor , stepper motor , brushless motor , s motor , etc
Week 15	Preparatory week before final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to measuring devices and identifying wattmeter
Week 2	Characteristics of single-phase electric transformers
Week 3	Open circuit test of transformers
Week 4	Load circuit for single phase transformers
Week 5	Three phase transfer theorem delta- delta
Week 6	Three phase transfer theorem delta- star
Week 7	Three phase transfer theorem star- delta
Week 8	Three phase transfer theorem star- star
Week 9	Characteristics of DC machine
Week 10	load test of three phases (I.M)
Week 11	open circuit test of three phases (I.M)
Week 12	short circuit test of three phases (I.M)
Week 13	Speed control of DC motor + load test of DC generator
Week 14	Series & Shunt DC machine connection. Compound connection of DC machine.
Week 15	Preparatory week before final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Electrical Machines and Drives Fundamentals and Advanced Modelling by Jan A. Melkebeek	Yes
Recommended Texts	Electrical Machines Drives and Power Systems 5th Edition By Theodore Wildi	No
Websites		



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

أ.د. هارون عبد الكاظم شهد
عميد الكلية

أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 26

أ.د. محمود شاكر نصر
رئيس القسم

أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 26

م.م. ثامر محمد هنين
اسم التدريسي

م.م. ثامر محمد هنين

التاريخ : 2026 / 3 / 26

وصف المقرر لمادة

Module Information				
معلومات المادة الدراسية				
Module Title	Electronic Circuits I		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET2102			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level			Semester of Delivery	Four
Administering Department			College	College of engineering





Module Leader	Ruqaya Alaa Ebrahim	e-mail	ruqia_alaa_ibrahim@hilla-unc.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Ruqaya Alaa Ebrahim	e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	15 / 3 / 2026	Version Number	

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



Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Developing the skills of understanding, analyzing and designing electronic circuits for semiconductor diodes and BJT transistors and their practical applications□
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Recognize how Semiconductor Diode work . List the various Applications associated with Semiconductor Diode . Summarize what is meant by a Bipolar Junction Transistor . Discuss the operation of BJT Transistor . Discuss the various operation regions of BJT Transistor . DC Biasing design of BJT transistor . Ability to analyze the BJT AC circuits . Design Various type of amplifiers using BJT Transistor .
Indicative Contents المحتويات الإرشادية	Part A – PN Diode Semiconductor Diodes – Introduction, Semiconductor Materials: Ge, Si, AND .GaAs Energy levels, n-Type and P-Type Materials, Semiconductor diode Biasing, Diode equivalent circuits, Light Emitting Diodes [7 hrs] Diode Applications – Load line analysis, Series and parallel circuit, Sinusoidal Rectification, Clippers, Clampers, Zener Diodes. [11 hrs] Revision problem classes [3 hrs] Part B – BJT Transistor BJT Transistor –Transistor construction, Transistor Operation, Transistor operation regions, Transistor Configurations, Transistor Limits. [9 hrs] BJT Biasing – Operating Point and Load Line, Fixed Bias, Emitter Bias, ,Voltage divider and feedback Bias, Design operations. [12 hrs] BJT AC analysis – Amplification in AC domain, BJT Transistor Modelling, re Transistor model, BJT configuration AC analysis, BJT loading effects, Cascaded systems. [13 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

Theory in class room
Practical in Lab
Quizzes and home works

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	107	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	7.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	15 0		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Semiconductor Diodes: Unbiased PN Junction, Forward & Reverse Biased PN Junction, Diode Characteristics: Diode Equation, Diode Equivalent Circuits, Graphical Solution,
Week 2	Breakdown & Biasing diode, Dc characteristics power dissipation in a diode.
Week 3	Zenor diodes
Week 4	Diode Applications: Rectifiers, Half and full wave rectifiers, wave form shaping Capacitor :Filter, Inductor smoothing.
Week 5	Bipolar Junction Transistor(BJT): Operation of pnp and npn, Current ,Components
Week 6	Biasing the BJT: Fixed Bias, the emitter current, Base common emitter amplifier, Self-Bias
Week 7	
Week 8	.Mid-term exam
Week 9	Equivalent circuit model, Dc analysis of transistor, Load line, h parameters in common emitter.
Week 10-13	Small Signal Low Frequency Analysis: Transistor amplifier, Ac equivalent circuit Graphical Analysis
Week 14-15	Comparison of BJT Amplifier Configurations, Cascading Amplifiers, Simplified Models.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الأسبوعي للمختبر

Week 1	Introduction to NI Multisim
Week 2	Half wave rectifier
Week 3	Full wave rectifier
Weeks 4-5	Clippers
Weeks 6-7	Clampers
Weeks 8-9	Zener Diode regulator
Week 10	BJT DC analysis
Week 11	BJT amplifier
Week 12	Astable Multivibrator
Weeks 13-14	\Bistable Multivibrator
Week 15	Monostable Multivibrator

Learning and Teaching Resources

مصادر التعلم والتدريس



	Text	Available in the Library?
Required Texts		
Recommended Texts		
Websites		

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

اسم التدريسي: م.م. رقية علاء إبراهيم رئيس القسم: أ.د. محمود شاكر نصر عميد الكلية: أ.د. هارون عبد الكاظم شهد

التاريخ: 2026 / 3 / 15 التاريخ: 2026 / 3 / 15 التاريخ: 2026 / 3 / 15

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية



Module Information					
معلومات المادة الدراسية					
Module Title	Engineering Mathematics		Module Delivery		
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	MIET2104				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII			Semester of Delivery
Administering Department		MIET	College	EETC	
Module Leader	Asst . Lect Huda Kadhim		e-mail	Huda_kadhim_ramah@hilla-unc.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		M.SC
Module Tutor	Asst . Lect Huda Kadhim		e-mail	Huda_kadhim_ramah@hilla-unc.edu.iq	
Peer Reviewer Name		Asst . Lect Huda Kadhim	e-mail	Huda_kadhim_ramah@hilla-unc.edu.iq	
Scientific Committee Approval Date		24/03/2026	Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Integral Mathematics-MIET1204	Semester	UGI-S2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. The goal of this module is to give students the necessary mathema and tools to solve a range of design engineering issues. 2. Demonstrate basic knowledge and understanding of a core of vector analysis, 

	linear algebra and applied mathematics. 3. Introduce student to Infinite and power series. 4. Understand how to solve Differential equations of the 1st and nth order. 5. Introduce student to Integral Transforms: Fourier series and Laplace transform and their applications in signal and systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define a vector, represent a vector by a directed straight line, add vectors, write a vector in terms of component vectors, write a vector in terms of component unit vectors, set up a coordinate system for representing vectors, and obtain the direction of a vector. 2. Explain the concept of a vector field and make sketches of simple vector fields in the plane 3. Memorize algebraic definitions and explain geometric meanings of dot and cross products 4. Compute dot and cross products given either algebraic or geometric information. 5. Apply dot or cross product to determine angles between vectors, scalar and vector projections, and volumes of parallelepipeds. 6. Memorize change of coordinate formulae between rectangular and cylindrical coordinate systems. 7. Memorize change of coordinate formulae between rectangular and spherical coordinate systems. 8. Identify coordinate surfaces in cylindrical and spherical coordinate systems as well as Converting equations between rectangular, cylindrical and spherical coordinate systems. 9. know what is meant by infinite series & its convergence, 10. Learn formation of Differential Equations - solutions of first order Differential Equations: Homogeneous-Non-homogeneous - Exact – Non-exact and solutions of nth order Differential Equations as well. 11. Definition of Laplace and Fourier transforms, Condition for existence, Laplace transform of standard functions, Properties of Laplace transform, 12. Application of Laplace and Fourier transforms to ordinary differential equations.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Vector analysis, Vector fields, Orthogonal vectors and Dot Product, Parallel vectors and Cross Product, in addition to Partial Derivatives: Formulas for Del operation. [25 hrs] Polar Coordinates, Cylindrical Coordinates Systems, Spherical Coordinates Systems and Infinite series. Power series. [23 hrs] Convergence and divergence series, Differential equation of the first order, Differential equation of <i>nth</i> order. Integral Transforms: Fourier series and Laplace 

	transform.[25 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. Classes and interactive lessons will be used to achieve this.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	4 and 10	LO #1- #4 and #5 - #9
	Online assignments	2	5% (10)	3 and 6	LO #1- #4 ar
	Report	1	10% (10)	14	LO #1- #6 ar
	OnSite	2	5% (10)	5 and 14	LO #1- #5 and #0- #12

	assignment				
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #8
	Final Exam	3hr	50% (50)	16	LO #1- #12
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المناهج الاسبوعي النظري	
	Material Covered
Week 1	Vector analysis.
Week 2	Vector fields.
Week 3	Orthogonal vectors and Dot Product.
Week 4	Parallel vectors and Cross Product.
Week 5	Partial Derivatives: Formulas for Del operation.
Week 6	Polar Coordinates.
Week 7	Mid-term Exam + Cylindrical Coordinates Systems.
Week 8	Spherical Coordinates Systems.
Week 9	Infinite series.
Week 10	Power series.
Week 11	Convergence and divergence series.
Week 12	Differential equations.
Week 13	Differential equation of the first order.
Week 14	Differential equation of n th order.
Week 15	Integral Transforms: Fourier series and Laplace transform.
Week 16	Preparatory week before the final Exam.

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?



Required Texts	https://dokumen.tips/download/link/engineering-mathematics-5th-ed-by-k-a-stroud.html (pdf)	No
Recommended Texts	https://www.bau.edu.jo/UserPortal/UserProfile/PostsAttach/59003_3812_1.pdf	No
Websites	https://dokumen.tips/download/link/engineering-mathematics-5th-ed-by-k-a-stroud.html	

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


 د. ه. الكاظم
 عميد الكلية

عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 15



رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15

اسم التدريسي: م.م. هدى كاظم رمح

التاريخ : 2026 / 3 / 15

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Laboratory Medical Instrumentation I	Module Delivery
Module Type	Core	☒ Theory



Module Code	MIET2101			☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar	
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		UGII	Semester of Delivery		3
Administering Department		MIET	College	EETC	
Module Leader	Hayder Fadhil Jawad		e-mail	haydershubber@gmail.com	
Module Leader's Acad. Title		Assistant Lecturer	Module Leader's Qualification		M.Sc.
Module Tutor	Hayder Fadhil Jawad		e-mail	haydershubber@gmail.com	
Peer Reviewer Name		Hayder Fadhil Jawad	e-mail	haydershubber@gmail.com	
Scientific Committee Approval Date	24/3/2026		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. The graduate get scientific and applied skills to diagnose the medical instruments faults. 2. The graduated students will gain the ability of knowledge of different parts of medical instruments. 3. Development and training the engineering technical staff on medical device maintenance. 4. Preparation of the research and studies to improve and develop the medical devices.
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	5. Prepare application engineers in technical and electronic engineering. 6. Put the proposals and alternatives for the medical devices.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the course, students should be able to: 1. Define the Medical instrumentation and recognize what is the laboratory security system and determine the quality control results in the medical laboratory. 2. Classify the medical instrumentation. 3. Describe the hospital design. 4. Design and Describe the operating room. 5. Understand patient safety laws and rules. 6. Define and understand the medical Laboratory Instruments and Tools. 7. Calibration of Medical Laboratory Instruments. 8. Define, explain, and describe Balances and understand the electrical and electronic parts. 9. Explain the types of balances and their medical application. 10. Define, explain, and describe water bath and understand the electrical and electronic parts. 11. Define, explain, and describe wax bath and understand the electrical and electronic parts.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Medical instrumentation classification, analysis lists, work security rules, and best laboratory use guidelines [14 hr]. Calibration of instruments criteria, types, components, advantages and disadvantages, physical and medical applications. [14hr] Medical instrumentation faults and maintenance, analysis lists, work security rules, and best laboratory use guidelines [14hr]. Patient safety and hospital design rules [15h]. Classification of different types of medical laboratories like medical, biological histological and chemical [13hr].

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 design, while at the same time refining and expanding their medical instrumentations thinking skills. This will be through classes, interactive tutorials, and by considering types of experiments involving some sampling activities that are interesting to students. 

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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	81	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Definition to medical instruments.
Week 2	Introduction to medical instruments.
Week 3	Classification of medical instrumentation.
Week 4	Design of hospitals.
Week 5	Design of operating room.



Week 6	Patient Safety.
Week 7	Mid-term exam
Week 8	Medical Laboratory Instruments and Tools-1
Week 9	Medical Laboratory Instruments and Tools- 2
Week 10	Classification of different medical laboratories
Week 11	Calibration of Medical Laboratory Instruments.
Week 12	Introduction to Balance.
Week 13	Balance and their types.
Week 14	Wax bath. Water bath.
Week 15	The preparatory week before the final exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to medical instruments.
Week 2	Classification of medical instrumentation.
Week 3	Medical Laboratory Instruments and Tools.
Week 4	Patient Safety.
Week 5	Calibration of Medical Laboratory Instruments.
Week 6	Classification of different medical lab.
Week 7	Introduction to Balance.
Week 8	Balance and their types.
Week 9	Wax bath.
Week 10	Water bath.
Week 11	Exam.

Learning and Teaching Resources

مصادر التعلم والتدريس



	Text	Available in the Library?
Required Texts	Biomedical device technology ,by ANTHONY Y. K. CHAN, MSc, MEng, PEng, CCE	
Recommended Texts	Ananthi ,2005,"A text book of medical instruments	
Websites		

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

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

عميد الكلية: أ.د. هارون عبد الكاظم شهد

التاريخ: 2026 / 3 /

رئيس القسم: أ.د. محمود شاكر نصر

التاريخ: 2026 / 3 /

اسم التدريسي: م.م حيدر فاضل جواد

التاريخ: 2026 / 3 /

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	The crimes of the Ba'ath regime in Iraq	Module Delivery
Module Type	Basic	☒ Theory



Module Code	MTU1007			☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level		2	Semester of Delivery		3
Administering Department		MIET	College	EETC	
Module Leader	MSc Ammar Ibrahim		e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name		Ahmed J. Abid	e-mail		
Scientific Committee Approval Date		20/3/2026	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	يهدف هذا المقرر الدراسي إلى تعزيز فهم الطلاب للجرائم والانتهاكات التي وقعت خلال فترة نظام البعث في العراق وتأثيرها على الأفراد والمجتمع، وتشجيع التحليل والنقاش حول هذه القضايا المهمة. ومن أبرز الأهداف للمادة الدراسية هي اني يكون الطالب قادراً على أن : 1. فهم مفهوم الجرائم وأقسامها. - دراسة جرائم نظام البعث والقوانين المتعلقة بها. - التعرف على الجرائم النفسية والاجتماعية وآثارها على الفرد والمجتمع. - تحليل الانتهاكات القانونية في العراق، بما في ذلك الانتهاكات لحقوق الإنسان والجرائم ذات الصلة. 5. فهم الجرائم البيئية وآثارها، بما في ذلك التلوث وتدمير المدن والقرى وتجفيف الأهوار.
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	6. دراسة جرائم المقابر الجماعية وفهم أحداث المقابر والتصنيف الزمني لها في العراق.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات التعلم للمادة الدراسية هي: 1. فهم مفهوم الجرائم وقدرة الطلاب على تصنيف الجرائم وفقاً لأقسامها. 2. تحليل جرائم نظام البعث وفهم القوانين المتعلقة بها، بما في ذلك الجرائم الدولية. 3. القدرة على التعرف على الجرائم النفسية لنظام البعث وفهم الآثار النفسية لجرائم نظام البعث على الأفراد والمجتمع. 4. القدرة على التعرف على الجرائم الاجتماعية لنظام البعث الآثار الاجتماعية لجرائم نظام البعث على الأفراد والمجتمع. 5. التعرف على الانتهاكات القانونية لنظام البعث في العراق وفهم أنواع الانتهاكات ومكان احتجاز الأفراد. 6. التعرف على صور انتهاكات حقوق الإنسان وجرائم السلطة التي وقعت خلال فترة نظام البعث. 7. التعرف على الانتهاكات السياسية والعسكرية لنظام البعث. 8. فهم الجرائم البيئية لنظام البعث والقدرة على تحليل تأثيرها على البيئة والمجتمع. 9. دراسة جرائم المقابر الجماعية لنظام البعث. 10. فهم الأحداث المرتبطة بجرائم المقابر الجماعية وتصنيفها زمنياً.
Indicative Contents المحتويات الإرشادية	المحتويات الإرشادية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم. ومن بين المحتويات الإرشادية المهمة: 1. تعريف الجريمة لغة واصطلاحاً، مفهوم الجريمة، أقسام الجريمة 2. جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005 3. الجرائم النفسية والاجتماعية وأثارها 4. عسكرة المجتمع، موقف النظام البعثي من الدين 5. انتهاكات القوانين العراقية، صور انتهاكات حقوق الإنسان وجرائم السلطة 6. بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث 7. أماكن السجون والاحتجاز لنظام البعث 8. الجرائم البيئية لنظام البعث في العراق 9. جرائم المقابر الجماعية 10. أحداث مقابر الإبادة الجماعية المرتكبة من النظام البعثي في العراق 11. التصنيف الزمني لمقابر الإبادة الجماعية في العراق للمدة 1963م - 2003م

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	استراتيجيات التعلم والتعليم المستخدمة في مادة جرائم حزب البعث البائد تشمل مجموعة متنوعة من النهج والتقنيات التي تعزز عملية التعلم للطلاب. من بين هذه الاستراتيجيات: 1. التفاعل النشط: يتم تشجيع الطلاب على المشاركة والمشاركة الفعالة في الدروس من خلال المناقشات الجماعية والأنشطة التفاعلية. 2. التعلم التعاوني: يشجع التعاون والتعاون بين الطلاب من خلال العمل الجماعي والمشاريع الجماعية، حيث يتعاون الطلاب مع بعضهم البعض لتحقيق أهداف التعلم المحددة. استخدام التقنيات الحديثة: يستفيد الطلاب من استخدام التكنولوجيا في عملية التعلم، مثل استخدام الحواسيب والإنترنت للبحث والتعلم الذاتي.



4. توفير ردود فعل فورية: يتم توفير ردود فعل فورية وتقييم مستمر للطلاب، سواء عن طريق التقييمات الشفهية أو الكتابية، مما يساعدهم على تحسين أدائهم وتطوير مهاراتهم.	
5. التنوع في وسائل التواصل: يتم استخدام مجموعة متنوعة من وسائل التواصل والتعليم، مثل المحاضرات التوضيحية، والمناقشات الجماعية، والأنشطة العملية، والعروض التقديمية، لتلبية احتياجات وأساليب التعلم المختلفة للطلاب.	

Student Workload (SWL)			
الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem)	33	Structured SWL (h/w)	2
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1
الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem)	50		
الحمل الدراسي الكلي للطلاب خلال الفصل			

Delivery Plan (Weekly Syllabus)		
المنهاج الاسبوعي النظري		
الأسبوع الأول	تعريف الجريمة لغة واصطلاحاً، مفهوم الجريمة، أقسام الجريمة	
الأسبوع الثاني	جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005	
الأسبوع الثالث	الجرائم النفسية لنظام البعث وفهم الآثار النفسية لجرائم نظام البعث على الأفراد والمجتمع.	
الأسبوع الرابع	الجرائم الاجتماعية لنظام البعث وفهم الآثار الاجتماعية لجرائم نظام البعث على الأفراد والمجتمع.	
الأسبوع الخامس	انتهاكات القوانين العراقية	
الأسبوع السادس	بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث	
الأسبوع السابع	امتحان نصف الفصل	
الأسبوع الثامن	الجرائم البيئية لنظام البعث في العراق (التلوث الحربي وسياسة الأرض المحروقة)	
الأسبوع التاسع والعاشر	تجفيف الأهوار و تجريف بساتين النخيل والأشجار والمزروعات	
الأسبوع الحادي عشر و الأسبوع الثاني عشر	جرائم المقابر الجماعية وأحداث مقابر الإبادة الجماعية المرتكبة من النظام البعث في العراق	
الأسبوع الثالث عشر والرابع عشر والخامس عشر	التصنيف الزمني لمقابر الإبادة الجماعية في العراق للمدة من (1963-2003) م	
الأسبوع السادس عشر	التهيئة لامتحان النهائي	

Module Evaluation				
تقييم المادة الدراسية				
Time/ Number	Weight (Marks)	Week Due	Relevant Lear Outcome	



Formative assessment	Quizzes	2	% (10)	5,9	LO #1,2,3, LO # 6,7
	Assignments	2	% (10)	6,13	LO # 4 and LO# 9
	Seminar	1	% (10)	12	LO# 5,6,7,8
	Report	1	% (10)	14	LO # 8,9,10
Summative assessment	Midterm Exam	2 hours	10% (10)	7	LO # 1-7
	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	منهاج وزارة التعليم العالي والبحث العلمي العراقية - جرائم نظام البعث في العراق 2023	Yes
Recommended Texts		No
Websites	The Collage E-Library	

Grading Scheme

مخطط الدرجات

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



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

أ.د. هارون عبد الكاظم شهد
العميد

رئيس القسم : أ.د. محمود شاكر نصر

Kareem

عميد الكلية : أ.د. هارون عبد الكاظم شهد

رئيس القسم : أ.د. محمود شاكر نصر

اسم التدريسي: م.م. عمار ابراهيم

التاريخ : 2026 / 3 / 20

التاريخ : 2026 / 3 / 20

التاريخ : 2026 / 3 / 20

Level 2 – second semester

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		معلومات المادة الدراسية	
Module Title	Arabic Language II		Module Delivery
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MTU1009		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	Semester of Delivery	
Administering Department	ENG - STE	College	Faculty of engineering Techniques
Module Leader	Maysaa M. Kazem	e-mail	maysaamahmood80@gmail.com
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Maysaa M. Kazem	e-mail	maysaamahmood80@gmail.com
Peer Reviewer Name	Ahmed J. Abid	e-mail	dr.ahmedjabbar@mtu.edu.iq
Scientific Committee Approval Date	20/3/2026	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	أهداف المادة الدراسية هي اني يكون الطالب قادراً على أن: 1. يتعرف على ماهية التعبير القرآني. 2. يتعلم القواعد النحوية المستعملة في التعبير القرآني، والأثر البلاغي والفني الذي يترتب على كيفية التعبير القرآني، وأن يفهم الطالب كيفية التحليل للنصوص القرآنية. 3. يتعرف على شخصية من أهم شخصيات الأدب والشعر العربي والعراقي، بدر شاكر السياب، ومعرفة شعره. 4. يتعرف على علامات الإعراب الأصلية والفرعية، ويتعلم استعمالها في اللغة العربية، ويفهم الفرق بين علامات الإعراب الفرعية والأصلية. 5. يتعلم الفرق بين الجمل الأسمية والفعلية، ويتعرف على أنواع المبتدأ، وأنواع الخبر، ويفهم الفرق بينهما. 6. يتعرف على إن وأخواتها، ويتعلم القواعد الخاصة بها. 7. يفهم الفرق بين إنَّ و أنَّ، وأنَّو أنْ، ويطبق ذلك عند استعمال كل منها في النصوص. 8. يتعرف على كان وأخواتها، ويتعلم عمل كل منها في اللغة، ويتمكن من استعمالها الصحيح في اللغة. 9. يتعرف على عمل الأفعال الخمسة، وعلامات إعرابها، ويستطيع استعمالها بشكل صحيح في الخطاب، أو النص. 10. يتعرف على الأخطاء اللغوية، ويتعلم تجنبها أثناء الكتابة. 11. يدرس معلومات لغوية: الأضداد والمرادفات، والفرق اللغوية، والمعاملات النحوية، ويفهم الفرق بينها، ويتمكن من تحليلها. 12. يتعلم إعراب المثنى. 13. يتعرف على أنواع الجموع، ويتعلم التفريق بينها، ويفهم كيفية إعرابها. 14. يتعلم كيفية كتابة قواعد اللغة العربية في لوحة بيانية، ويتمكن من تصويب الأخطاء اللغوية.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات التعلم للمادة الدراسية هي: 1. قدرة الطالب على فهم التعبير القرآني، وتحليل النصوص. 2. القدرة على استخدام القواعد النحوية، وفهم الأساليب البلاغية والقدرة على استعمالها. 3. معرفة الطالب لشخصية الشاعر والأديب بدر شاكر السياب، وأهم أشعاره وآثاره. 4. القدرة على التمييز بين علامات الإعراب الأصلية والفرعية، والقدرة على استعمالها في الخطاب، أو النص. 5. قدرة الطالب على التمييز بين الجمل الأسمية والفعلية، وقدرته على التمييز بين أنواع المبتدأ، والخبر، وكيفية استعمال الجمل وإعرابها. 6. فهم الطالب لعمل إنَّ وأخواتها، وقدرته على استعمالها بشكل صحيح في الجمل. 7. القدرة على التفريق بين أنَّ وإنَّ، وإنَّو أنْ، واستعمالها في مواضعها الصحيحة في النصوص. 8. القدرة على فهم عمل كان وأخواتها، واستعمالها بشكل صحيح. 9. التمكن من معرفة وأعراب الأفعال الخمسة، وكيفية استعمالها في الجمل. 10. القدرة على معرفة وتجنب الأخطاء اللغوية عند الكتابة. 11. معرفة إعراب المثنى. 12. القدرة على التمييز بين الجموع، وكيفية إعرابها، واستعمالها في الجمل. 13. معرفة الطالب لمعلومات لغوية: المرادفات، والأضداد، والفرق اللغوية، والمعادلات النحوية، والقدرة على استخراجها، أو استعمالها في الجمل.
Indicative Contents المحتويات الإرشادية	المحتويات الإرشادية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم. ومن بين المحتويات الإرشادية المهمة: 1. مقدمة عن التعبير القرآني، وتعريف بالإعجاز اللغوي في آيات القرآن الكريم وجمالية اللغة العربية وبلاغتها. (4 ساعات) 2. التعريف بشخصية الشاعر الكبير بدر شاكر السياب، وأهمية شعره في الأدب العربي والعراقي. (4 ساعات) 3. دراسة علامات الإعراب، بنوعها، وكيفية الأعراب. (4 ساعات) 4. دراسة الجمل الأسمية والفعلية، وتعلم التفريق بين الأنواع المبتدأ، وأنواع الخبر. (4 ساعات) 5. دراسة إنَّ وأخواتها، وكيفية عملها وأعرابها. (4 ساعات)

	6. دراسة الفرق بين إنَّ وأنَّ، وإنَّ وأنَّ، وكيفية عملها وإعرابها. (4 ساعات)
	7. دراسة كان وأخواتها ، وكيفية عملها وإعرابها. (4 ساعات)
	8. التعريف بالأفعال الخمسة ، وعملها وإعرابها.. (4 ساعات)
	9. دراسة الأخطاء اللغوية الشائعة وتطبيقاتها في النصوص. (4 ساعات)
	10. تعلم المعلومات اللغوية : الأضداد والمترادفات، والفروق اللغوية ، والمعادلات النحوية. (3 ساعات)
	11. دراسة المثنى وأعرابه. (3 ساعات)
	12. دراسة الجموع ، وأنواعها وإعرابها. (3 ساعات)
	13. دراسة القواعد النحوية وكتابتها في رسم بياني ، وتصويب الأخطاء اللغوية. (3 ساعات)

Learning and Teaching Strategies استراتيجيات التعلم والتعليم

Strategies	استراتيجيات التعلم والتعليم المستخدمة في مادة اللغة تشمل مجموعة متنوعة من النهج والتقنيات التي تعزز عملية التعلم للطلاب. من بين هذه الاستراتيجيات:
	1. التفاعل النشط: يتم تشجيع الطلاب على المشاركة والمشاركة الفعالة في الدروس من خلال المناقشات الجماعية والأنشطة التفاعلية.
	2. التعلم التعاوني: يشجع التعاون والتعاون بين الطلاب من خلال العمل الجماعي والمشاريع الجماعية، حيث يتعاون الطلاب مع بعضهم البعض لتحقيق أهداف التعلم المحددة.
	3. التطبيق العملي: يتم توفير فرص للطلاب لتطبيق المفاهيم والمهارات المكتسبة في سياقات عملية وواقعية، مما يعزز التفاعل الفعال مع المادة.
	4. استخدام التقنيات الحديثة: يستفيد الطلاب من استخدام التكنولوجيا في عملية التعلم، مثل استخدام الحواسيب والإنترنت للبحث والتعلم الذاتي.
	5. توفير ردود فعل فورية: يتم توفير ردود فعل فورية وتقييم مستمر للطلاب، سواء عن طريق التقييمات الشفهية أو الكتابية، مما يساعدهم على تحسين أدائهم وتطوير مهاراتهم.
	6. التنوع في وسائل التواصل: يتم استخدام مجموعة متنوعة من وسائل التواصل والتعليم، مثل المحاضرات التوضيحية، والمناقشات الجماعية، والأنشطة العملية، والعروض التقديمية، لتلبية احتياجات وأساليب التعلم المختلفة للطلاب.
	7. باستخدام هذه الاستراتيجيات، يتم تعزيز التفاعل والتعلم الفعال للطلاب، و
	8. تحفيزهم على المشاركة واكتساب المعرفة والمهارات بشكل شامل وشيق.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/w)	الحمل الدراسي المنتظم للطلاب أسبوعيا	33	2
Unstructured SWL (h/w)	الحمل الدراسي غير المنتظم للطلاب أسبوعيا	17	1
Total SWL (h/w)	الحمل الدراسي الكلي للطلاب خلال الفصل		50

Module Evaluation

تقييم المادة الدراسية

		Time/ Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	3	15% (15)	5, 10, 13	LO #1, 5, and 11
	Assignments	3	15% (15)	2, 11, 14	LO # 3, 6 and 12
	Projects / Lab.				
	Report	1	10% (10)	14	LO # 1-13
Summative Assessment	Midterm Exam	2 hours	10% (10)	7	LO # 1-7
	Final Exam	3 hours	50% (50)	16	All



Total assessment	100% (100 Marks)		
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المنهاج الاسبوعي النظري Delivery Plan (Weekly Syllabus)	
الأسبوع الأول ، والثاني	التعبير القرآني، نحويًا من حيث تركيب الجملة والنص. بلاغيا من حيث التأثير الفني، والرجوع إلى المصدر (كتاب التعبير القرآني) للدكتور فاضل السامرائي.
الأسبوع الثالث	الشاعر بدر شاكر السياب.
الأسبوع الرابع	علامات الإعراب الأصلية: (الفتحة والضمة، والكسرة)، وعلامات الإعراب الفرعية: (الألف، والواو، والياء).
الأسبوع الخامس	الجملة الأسمية – المبتدأ والخبر، وأنواع المبتدأ، وأنواع الخبر.
الأسبوع السادس	أن وأخواتها
الأسبوع السابع	الفرق بين إنَّ وأنَّ، وأنَّ وإنَّ.
الأسبوع الثامن	كان وأخواتها.
الأسبوع التاسع والعاشر	الأفعال الخمسة.
الأسبوع الحادي عشر	الأخطاء اللغوية الجزء (2)
الأسبوع الثاني عشر	معلومات لغوية: المرادفات والاضداد، وفروق لغوية. ومعادلات نحوية.
الأسبوع الثالث عشر والرابع عشر	المثنى وإعرابه.
الأسبوع الخامس عشر	أنواع الجموع: جمع المذكر السالم- جمع المؤنث السالم- جمع التذكير.
الأسبوع السادس عشر	هندسة النحو: قواعد اللغة العربية في لوحة تعليمية، وتصويبات لغوية

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• ملزمة اللغة العربية (المعممة من وزارة التعليم العالي والبحث العلمي)	Yes
Recommended Texts	• التعبير القرآني للدكتور فاضل السامرائي.	No
Websites	The Collage E-Library	

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
Fail Group (0 - 49)	FX - Fail	راسب (قيد المعالجة)	(45-49)	More work required by a
	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.

د. هارون عبد الكاظم شهد
عميد

رئيس القسم : د. محمود شاكر نصر

اسم التدريسي: م.م. عمار ابراهيم

التاريخ : 2026 / 3 / 20

التاريخ : 2026 / 3 / 20

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Biomedical Transducers and Sensors		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET2205			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGII	Semester of Delivery		4
Administering Department	MIET	College	EETC	
Module Leader	Asst . Lect Huda Kadhim		e-mail	Huda_kadhim_ramah@hilla-unc.edu.iq
Module Leader's Acad. Title	Lecturer		Module Leader's Qualification	M.SC
Module Tutor	Asst . Lect Huda Kadhim		e-mail	Huda_kadhim_ramah@hilla-unc.edu.iq
Peer Reviewer Name	Asst . Lect Huda Kadhim		e-mail	Huda_kadhim_ramah@hilla-unc.edu.iq
Scientific Committee Approval Date	24/03/2026		Version Number	1.0



Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Fundamental of Electrical Engineering (AC) - MIET1201	Semester	UGI-S2
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. Analyze errors and uncertainty of experimental results obtained from biomedical sensors. 2. Understand requirements, calibration, characteristics, and parameters of biomedical sensors. 3. Design with confidence signal conditioning systems required for processing the sensors responses. 4. Understand the operating principle, types, parameters, signal conditioning, and applications of resistive, reactance variation and self-generating sensors. 5. Understand the operating principle of different types of optical sensors and their features. 6. Understand the operation, models, and parameters of ultrasound transducers. 7. Understand the design, main building blocks, features, and calibration of intelligent sensors.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define biomedical sensors, biosensors, and biomedical transducers. 2. Classify the biomedical sensors. Acquire knowledge about sensor data processing and feature extraction. 3. Recognize the requirements of biomedical sensors. 4. Explain the Static and dynamic characteristics of biomedical sensors. 5. Explain the requirements of signal conditioning circuits suitable for biomedical sensors. 6. Identify design principles of conditioning circuits. 7. Identify the different types of resistive, reactance variation and self-generating sensors. 8. Explain the operating principle, parameters, calibration and applications of resistive, reactance variation and self-generating sensors. 9. Identify the different types of optical sensors. 10. Reveal the advantages of optical sensors. 11. Classify ultrasound transducers.



	13. Recognize the main parts of ultrasound transducers. 14. List the main features of intelligent sensors.
Indicative Contents المحتويات الإرشادية	<u>Indicative Contents including the following:</u> General concept and terminology, Sensor classification and calibration, static and dynamic characteristics, errors [10 hrs] Resistive Temperature Detectors (RTD), Thermistors, light-dependent resistors, signal conditioning for resistive sensors [5hrs] Capacitive sensors, Inductive sensors, Electromagnetic sensors, signal conditioning for reactance variation sensors [5 hrs] Thermoelectric sensors, Piezoelectric sensors, Electrochemical sensors, Signal conditioning for self-generating sensors.[7 hrs] Optical techniques, General principles of optical sensing, Fiber-optic basics, Fiber-optic sensor technologies and applications[7 hrs] Fundamentals of ultrasonic-based sensors, Ultrasonic-based sensing methods and applications.[8 hrs] Definition, parameters, features, operating principle , main building blocks and applications.[5 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Active learning, where students should be active and involved in the learning process inside the classroom, will be emphasized in the delivery of this course. ➤ Different active learning methods/approaches such as: Engaged Learning, Project-Based Learning, Cooperative Learning, Problem-based Learning, Structured Problem-solving, will be used. ➤ The teaching method that will be used in this course will be composed of a series of mini lectures interrupted with frequent discuss brainstorming exercises. PowerPoint presentations will be prepared for the course materials.



	➤ Use software packages for design and simulation of signal conditioning circuits implemented using these sensors.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered



Week 1,2	Introduction to Biomedical Sensors General concept and terminology, Sensor classification and calibration, static and dynamic characteristics, errors and uncertainty.
Week 3,4	Resistive Sensors and their signal conditioning Potentiometers, Strain gages, Resistive Temperature Detectors (RTD), Thermistors, light-dependent resistors, signal conditioning for resistive sensors
Week 5,6	Reactance Variation and Electromagnetic Sensors Capacitive sensors, Inductive sensors, Electromagnetic sensors, signal conditioning for reactance variation sensors,
Week 7	Mid- Exam
Week 8,9	Self-Generating Sensors and Signal Conditioning Thermoelectric sensors, Piezoelectric sensors, Electrochemical sensors, Signal conditioning for self-generating sensors.
Week 10,11	Optical Sensors Optical techniques, General principles of optical sensing, Fiber-optic basics, Fiber-optic sensor technologies and applications.
Week 12,13	Ultrasound Transducers Fundamentals of ultrasonic-based sensors, Ultrasonic-based sensing methods and applications.
Week 14	Intelligent Sensors Definition, parameters, features, operating principle , main building blocks and applications.
Week 15	Preparatory week before final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1,2	Characteristics of various Biomedical sensors(Pulse sensor, Galvanic skin Response, Glucose sensor, EMG sensor).
Week 3,4	Measurement of Resistance, Inductance and Capacitance using bridge circuits.
Week 5	Measurement of temperature using thermistor and RTD.
Week 6	Design of preamplifiers to acquire bio-signals along with impedance matching circuit u suitable ICs.
Week 7,8	Design of EEG, ECG amplifiers and Measurement of heart rate.



Week 9,10	Acquire and display electrical and biological biosignals on a computer using the appropriate hardware and software tools.
Week 11	e-Health Sensor Platform V2.0 using Arduino and Raspberry Pi.
Week 12	Measurement of respiration rate.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Sensors and Signal Conditioning, Ramon Pallas-Areny and John G. Webster, John Wiley & Sons, 2001,2nd Edition	No
Recommended Texts	Biosensors: An Introduction , Eggins, Brian, John Wiley & Sons, 1996,1st Edition	No
Websites	https://www.multisim.com/	

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

د. د. هادي عبد الحليم
الحمد

جامعة بغداد
مكتبة الجامعة

عميد الكلية : أ.د. هارون عبد الكاظم شهد

رئيس القسم : أ.د. محمود شاكر نصر

اسم التدريسي: م.م. هدى كاظم رمح

التاريخ : 2026 / 3 / 24

التاريخ : 2026 / 3 / 24

التاريخ : 2026 / 3 / 24



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Digital Electronics		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MIET2203		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	4
Administering Department	MIET	College	EETC
Module Leader	Hussein F. Hamdan	e-mail	eng.hussain.fadhle@uobabylon.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D
Module Tutor		e-mail	
Peer Reviewer Name	Hussein F. Hamdan	e-mail	eng.hussain.fadhle@uobabylon.edu.iq
Scientific Committee Approval Date	8/11/2023	Version Number	1.0

Relation with other Modules		
العلاقة مع المواد الدراسية الأخرى		
Prerequisite module	Electronics Circuits I (MIET2102)	Semester
		S3



Co-requisites module		Semester	
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Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. To learn the basics of logical circuits which are used in computers. 2. To understand how the logical medical instrumentations to work 3. To program the logical medical instrumentations 4. To design the logical medical instrumentations 5. To learn how to use logical tables to perform the logical medical instrumentations 6. TO maintain the logical medical instrumentations 7. To suggest how to build modern the logical medical instrumentations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	At ending of course, student will: 1-know the numbers systems, and conversion between them. 2-know binary codes. 3-design binary gates, and use Boolean algebra. 4-design and simplify the arithmetic circuits. 5- define Karnaugh maps. 6- know how flip-flops works RS, JK. 7- design flip-flops D, T. 8-define the work principles of counters and its types. 9-know the shift registers and types. 10-principles of decoders. 11-identify the Multiplexers and De-Multiplexers. 12-conversion of analog to digital circuits.
Indicative Contents المحتويات الإرشادية	Numbers systems, Binary, Octal, Hexadecimal [4 H]. Codes numbers [4 H]. Arithmetic circuits [10 H]. De Margan's theorems [4 H]. Karnaugh map [8 H]. Flip – Flop: RS, RST, JK, D, FF [8 H].



	Asynchronous counter and synchronous [10 H]. Shift registers [10 H]. Multiplexer, De multiplexer [4 H]. Decoder [8 H]. Analog conversion [4 H].
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	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 9	LO #1, 2, 4,11 and 12
	Assignments	2	10% (10)	3, 13	LO # 4, 5, 7 and 8
	Projects / Lab.	1	10% (10)	Continuous	
	Report	13	10% (10)	13	LO # 6, 8 and11
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO # 1-8
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Number system: Binary numbers, Octal numbers, Hexadecimal numbers,
Week 2	Binary codes
Week 3	Logic gates, De Morgan's theorems, Laws and theorem of Boolean algebra
Week 4	Arithmetic circuit, Simplifying logic circuits:
Week 5	fundamentals products, sum of products, algebraic simplification
Week 6	Truth table to Karnaugh map
Week 7	Flip – Flop: RS, RST, JK, D, FF
Week 8	Counters: Asynchronous counter
Week 9	Counters: synchronous counter
Week 10	Shift registers: Serial in -Serial out shift register Serial in -Parallel out shift register
Week 11	Shift registers: Bidirectional Shift Register
Week 12	Multiplexer and De multiplexer
Week 13	Decoder
Week 14	Digital to Analog converter
Week 15	Final Exam (Practical)
Week 16	Final Exam (Theoretical)

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Logic Gates (NOT, AND)
Week 2	Lab 2: Logic Gates (OR, NAND, NOR)
Week 3	Lab 3: Logic Gates (XOR, XNOR)
Week 4	Lab 4: Exercises
Week 5	Lab 5: Universal Gates (NAND, NOR)
Week 6	Lab 6: Flip-Flop
Week 7	Lab 7: Adder (Half and Full Adder)
Week 8	Lab 8: Subtractor (Half and Full Subtractor)
Week 9	Lab 9: Comparator



Week 10	Lab 10: Asynchronous Binary Counter Up
Week 11	Lab 11: Asynchronous Binary Down Counter
Week 12	Lab 12: Asynchronous Binary Decade Counter
Week 13	Lab 13: Asynchronous MOD Counter
Week 14	Lab 14: Asynchronous Binary Counter (count from number to another)

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	DIGITAL FUNDAMENTALS / FLOYD	YES
Recommended Texts	Digital Logic Design - 4th Edition	NO
Websites	https://www.udemy.com/course/digital-electronics-logic-design/?utm_source=adwords&utm_medium=udemyads&utm_campaign=DSA_Catchall_la.EN_cc.ROW&utm_content=deal4584&utm_term=._ag_88010211481._ad_535397282061._kw._de_c._dm._pl._ti_dsa-52949608673._li_1007949._pd._&matchtype=&gclid=CjwKCAjwp6CkBgB_EiwAIQVyxcuQ427tsVehXbetXE4NUFlekP4rqq-PrCWgQflucPuo7Mqz8SXRvxoC5asQAvD_BwE	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
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	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.				




عميد الكلية : أ.د. هارون عبد الكاظم شهد

رئيس القسم : أ.د. محمود شاكر نصر

اسم التدريسي أ.د. حسين فاضل حمدان

Module Information				
Module Title	Electronic Circuits II		Module Delivery	
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET2202			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UG11	Semester of Delivery		
Administering Department	MIET	College		
Module Leader	Ruqaya Alaa		e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification		
Module Tutor	Ruqaya Alaa		e-mail	
Peer Reviewer Name		e-mail	ruqia_alaa_ibrahim@hilla-unc.edu.iq	
Scientific Committee Approval Date	15/3/2026	Version Number	1.0	

Relation with other Modules			
Prerequisite module	Electronics Circuits I-MIET2102	Semester	UGII-S3
Co-requisites module	None	Semester	



Module Aims, Learning Outcomes and Indicative Contents

Module Aims	1. The graduate get scientific and applied skills of electronic circuits 2. The graduated students will gain the ability of knowledge of different parts of electronic circuits. 3. Development and training the engineering technical staffs on the electronic circuits. 4. Preparation the research and studies to improve and develop the action of electronic circuits. 5. Prepare application engineers in technical and electronic engineers. 6. Put the proposals and alternatives for the electronic devices.
Module Learning Outcomes	Become aware of the general characteristics of electronic devices. Be able to describe the difference types of electronic categories. Develop a clear understanding of the basic operation and characteristics of electronic devices. 1. Become familiar with the use of equivalent circuits to analyze series, parallel, and series-parallel electronic networks. 2. Be able to predict the output response of an electronic networks. 3. Become familiar with the analysis of and the range of applications for electronic devices. 4. Become familiar with the basic construction and operation of the various types of electronic categories! 5. Be able to test a various type of electronic terminals. 6. Be able to determine the dc levels for the variety of important electronic circuits. 7. Understand how to measure the important voltage levels of electronic circuits. 8. Begin to understand the troubleshooting process as applied to electronic configurations. 9. Develop a sense for the stability factors of an electronic circuits. 10. Learn to use the equivalent model to find the important ac parameters for an amplifier. 11. Develop some skill in troubleshooting ac amplifier networks. 12. 13. 14.
Indicative Contents	Indicative content includes the following. <u>Part A Electronic Theory</u> JFETs: n -channel, p -channel, TRANSFER CHARACTERISTICS, Shockley's Equation , Shorthand Method [10 hrs] FET Biasing -Fixed-bias configuration, self-bias configuration, voltage-divider bias arrangement; common gate configuration , depletion-type MOSFETs , enhancementtype MOSFET [10 hrs]



	Revision problem classes [6 hrs] <u>Part B – Frequency response</u> Decibels- General Frequency Considerations, Low-Frequency Analysis—Bode Plot, Low-Frequency Response—BJT Amplifier with RL, Low-Frequency Response—FET Amplifier, High-Frequency Response—BJT Amplifier, High-Frequency Response— FET Amplifier [12 hrs] Operational Amplifiers - Differential Amplifier Circuit, BiFET, BiMOS, and CMOS Differential Amplifier Circuits, Op-Amp Basics, Practical Op-Amp Circuits, Op-Amp Specifications—DC Offset Parameters. [12 hrs] <u>Part C - Power Amplifiers</u> Series-Fed Class A Amplifier- Transformer-Coupled Class A Amplifier, Class B Amplifier Operation, Class B Amplifier Circuits, Amplifier Distortion.[10 hrs] Power Supplies (Voltage Regulators) [12 hrs]
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Learning and Teaching Strategies	
Strategies	The main strategy that will be encourage active participation and engagement of students through activities such as group discussions, hands-on experiments, problem solving tasks, and case studies. This approach promotes critical thinking, collaboration, and knowledge application and encourage students to explore and discover knowledge through inquiry and investigation. Pose open-ended questions or problem scenarios that require learners to research, analyze, and draw conclusions independently.



Student Workload (SWL)			
Structured SWL (h/sem)	79	Structured SWL (h/w)	5
Unstructured SWL (h/sem)	71	Unstructured SWL (h/w)	4
Total SWL (h/sem)	150		

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

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	FET Amplifiers.
Week 2	JFET Small-Signal Model
Week 3	General Frequency Considerations



Week 4	BJT frequency response
Week 5	JFET frequency response
Week 6	Power amplifier.
Week 7	Mid- Exam
Week 8	Series-Fed Class A Amplifier
Week 9	Class B,C and D amplifiers
Week 10	Feedback and Oscillator Circuits
Week 11	PNPN and Other Devices
Week 12	Operational amplifier
Week 13	Operational amplifier applications
Week 14	Power Supplies Voltage Regulators
Week 15	Preparatory week before final exam

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Lab 1: Common emitter transistor characteristics
Week 2	Lab 2: Common collector transistor
Week 3	Lab 3: Common emitter amplifier
Week 4	Lab 4: Transistor biasing (part 1)
Week 5	Lab 5: Transistor biasing (part 2)
Week 6	Lab 6: common collector amplifier
Week 7	Lab 7: Common base amplifier
Week 8	Lab 8: Collector feedback amplifier circuit
Week 9	Lab 9: Voltage divider biasing circuit
Week 10	Lab 10: Emitter follower
Week 11	Lab 11: JFET characteristics
Week 12	Lab12: JFET amplifier
Week 13	Lab13: operational amplifier (part1)
Week 14	Lab14: operational amplifier (part 2)



Learning and Teaching Resources			مصادر انتعهم وانتدريس
	Text	Available in the Library?	
Required Texts	electronic devices and circuit theory 11th edition, Robert L. Boylestad , Louis Nashelsky	Yes	
Recommended Texts		No	
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electricalengineering		

Grading Scheme				
Group	Grade	انتقذير	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.				


 د.أ. هارون عبد الكاظم شهد
 العميد



عميد الكلية : أ.د. هارون عبد الكاظم شهد

اسم التدريسي: م.م. رقية علاء ابراهيم رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15

التاريخ : 2026 / 3 / 15

2026 / 3 / 15



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language II		Module Delivery
Module Type	Basic		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MTU1003		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	Semester of Delivery	4
Administering Department	Hilla University	College	Faculty of engineering techniques
Module Leader	Qamar Marjan	e-mail	
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	20/3/2026	Version Number	1.0

Relation with other Modules



العلاقة مع المواد الدراسية الأخرى

Prerequisite module	English Language1 MTU1002	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	*Module Aims* The module aims of the English Language Course are structured to support learners at the intermediate to upper-intermediate level in enhancing their English language skills and achieving specific learning outcomes. By the end of this course, students will: *Grammar Mastery:* - Achieve a comprehensive understanding of advanced grammar rules, including the use of auxiliary verbs, present simple, present continuous, past simple, present perfect, future forms, questions and negatives, modals, comparatives and superlatives, conditionals, passive voice, relative clauses, present perfect continuous, and reported speech. *Vocabulary Expansion:* - Expand their vocabulary across various topics and contexts, such as everyday expressions, common activities, storytelling, experiences, permissions, hypothetical situations, descriptive details, and phrasal verbs. This will include learning advanced vocabulary related to describing characteristics, actions, and consequences. *Everyday English Proficiency:* - Develop practical language skills for everyday communication, focusing on effective use of everyday expressions, making comparisons, discussing future intentions, and navigating social interactions. This includes enhancing the ability to participate in conversations and use language appropriately in various social settings. *Reading Comprehension:* - Improve reading comprehension skills through engagement with diverse texts, including stories, articles, and informative content. Students will analyze and interpret texts, building the ability to understand complex language structures and themes. *Writing Competence:* - Enhance writing skills by composing various forms of written content,
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such as short stories, comparative essays, descriptive passages, and reviews. Students will learn to use linking words, express opinions, and structure their writing coherently.

6. *Critical Thinking and Analysis:*

- Develop critical thinking skills by analyzing and discussing texts, drawing comparisons, and making inferences. Students will be encouraged to engage with texts critically, assessing arguments and evidence.

7. *Cultural Awareness:*

- Gain insights into different cultures and lifestyles through readings and discussions, fostering a broader understanding of the world. This will help students develop cultural sensitivity and an appreciation for diversity.

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8. *Effective Communication:*

- Improve their ability to express ideas clearly and confidently in both spoken and written forms. The course will emphasize clarity, coherence, and fluency in communication, preparing students to articulate their thoughts effectively.

9. *Language Assessment Preparation:*

- Prepare for language assessments, including a final review and exam, by consolidating their understanding of grammar, vocabulary, and reading comprehension. This will include practicing various question formats and test-taking strategies.

10. *Independent Learning:*

- Develop skills for independent learning, enabling students to continue enhancing their English proficiency beyond the course. This includes fostering a habit of self-study and utilizing resources effectively.

11. *Language Fluency:*

- Work towards achieving greater fluency in English, allowing students to engage in complex conversations, express nuanced ideas, and write increased sophistication and ease.



	12. *Cultural Competency:* - Build cultural competence and sensitivity through exposure to diverse texts and discussions about different cultural perspectives. This will enhance students' ability to interact respectfully and knowledgeably in multicultural contexts. These module aims provide a comprehensive framework for student learning and development, ensuring that participants gain both linguistic competence and cultural awareness throughout the course.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Module Learning Outcomes Students will comprehend and discuss a variety of texts on diverse topics, enhancing their reading and analytical skills. Students will expand their vocabulary related to various topics, including everyday expressions, actions, experiences, and descriptive details. Students will be able to write various forms of text, including short stories, comparative essays, descriptive passages, and reviews. Students will use auxiliary verbs correctly in sentences, mastering their application in different tenses. Students will distinguish between present simple, past simple, present continuous, and present perfect tenses, understanding their appropriate contexts. Students will study and apply modal verbs such as must, should, can, and could, understanding their use in expressing necessity, possibility, and advice. Students will understand and correctly use comparative and superlatives to describe and compare objects and situations.

	Students will focus on verb patterns and express future intentions using appropriate grammatical structures. Students will learn the correct usage of first and second conditionals and the passive voice in various contexts. Students will effectively use defining and non-defining relative clauses to provide additional information in sentences. Students will describe ongoing actions and experiences using the present perfect continuous tense and appropriate time expressions. Students will learn to report statements, questions, and commands accurately, mastering the use of reported speech. Students will discuss hypothetical situations and understand the use of time and conditional clauses in various contexts. Students will acquire and use advanced vocabulary, including phrasal verbs and synonyms/antonyms, in both written and spoken communication.
Indicative Contents المحتويات الإرشادية	Intermediate Book (Based on "New Headway Plus: Intermediate Student's Book") Total Hours: 21 hours Week 1 (2 hours) Grammar: Auxiliary Verbs (Unit 1) Focus: Usage of "to be," "have," and other auxiliary verbs. Vocabulary: Everyday Expressions (Unit 1) Reading: "It's a Wonderful World!" (Unit 1) Writing: Basic sentences using auxiliary verbs

	Week 2 (2 hours) Grammar: Present Simple (Unit 2) Focus: Usage in daily routines and habits. Vocabulary: Common Activities (Unit 2) Reading: "Get Happy!" (Unit 2) Week 3 (2 hours) Grammar: Present Continuous (Unit 2) Focus: Actions happening now. Vocabulary: Actions and Activities (Unit 2) Reading: "Simple or Continuous?" (Unit 2) Week 4 (2 hours) Grammar: Past Simple (Unit 3) Focus: Narrating past events. Vocabulary: Telling Stories (Unit 3) Reading: "Telling Tales" (Unit 3) Writing: Writing a short story using past simple tense Week 5 (2 hours) Grammar: Present Perfect (Unit 1, 3) Focus: Describing experiences and actions with present relevance. Vocabulary: Experiences and Achievements (Unit 1, 3) Reading: "Present Perfect Stories" (Unit 1, 3) Week 6 (2 hours) Grammar: Future Forms (Unit 5) Focus: "Going to," "will," and present continuous for future plans. Vocabulary: Plans and Predictions (Unit 5) Reading: "On the Move" (Unit 5) Week 7 (2 hours)
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Grammar: Questions and Negatives (Unit 4)

Focus: Formulating questions and negative sentences.

Vocabulary: Social Interactions (Unit 4)

Reading: "Nothing but the Truth" (Unit 4)

Week 8 (2 hours)

Grammar: Modals (Unit 4, 7)

Focus: Expressing obligation, permission, and possibility.

Vocabulary: Permissions and Possibilities (Unit 4, 7)

Reading: "Doing the Right Thing" (Unit 4)

Week 9 (2 hours)

Grammar: Comparatives and Superlatives (Unit 6)

Focus: Comparing people, objects, and situations.

Vocabulary: Describing Characteristics (Unit 6)

Reading: "Making Comparisons" (Unit 6)

Writing: Comparative essay

Week 10 (1 hour)

Grammar: Conditionals (Unit 8)

Focus: First and second conditional structures.

Vocabulary: Hypothetical Situations (Unit 8)

Reading: "Just Imagine!" (Unit 8)

Week 11 (1 hour)

Grammar: Passive Voice (Unit 2, 3)

Focus: Usage in various tenses to emphasize actions.

Vocabulary: Actions and Consequences (Unit 2, 3)

Reading: "Passive Constructions" (Unit 2, 3)

Week 12 (1 hour)

Grammar: Relative Clauses (Unit 8)



	Focus: Defining and non-defining clauses. Vocabulary: Descriptive Details (Unit 8) Reading: "Descriptive Sentences" (Unit 8) Week 13 (1 hour)
	Grammar: Present Perfect Continuous (Unit 10) Focus: Describing ongoing actions and experiences. Vocabulary: Time Expressions (Unit 10) Reading: "Obsessions" (Unit 10) Writing: Describing ongoing activities using present perfect continuous Week 14 (1 hour)
	Grammar: Reported Speech (Unit 11) Focus: Reporting statements, questions, and commands. Vocabulary: Reporting Verbs (Unit 11) Reading: "Reported Conversations" (Unit 11) Week 15 (2 hours)
	Review and Exam Preparation Focus: Reviewing key grammar, vocabulary, and reading topics covered. Upper-Intermediate Book (Based on "New Headway Plus: Upper-Intermediate Student's Book") Total Hours: 7 hours (Max 25% of Total Content)
	Week 8 (1 hour)
	Reading: "Getting on Together" (Unit 7) Focus: Permissions and possibilities. Week 9 (1 hour)
	Vocabulary: Describing Characteristics (Unit 6) Reading: "Making it Big" (Unit 6)

	Week 10 (1 hour) Vocabulary: Hypothetical Situations (Unit 8) Reading: "Going to Extremes" (Unit 8) Week 11 (1 hour) Vocabulary: Actions and Consequences (Unit 7) Reading: "Getting on Together" (Unit 7) Week 12 (1 hour) Vocabulary: Descriptive Details (Unit 8) Reading: "Going to Extremes" (Unit 8) Week 13 (1 hour) Vocabulary: Time Expressions (Unit 10) Reading: "Risking Life and Limb" (Unit 10) Week 14 (1 hour) Vocabulary: Reporting Verbs (Unit 11) Reading: "In Your Dreams" (Unit 11)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Learning and Teaching Strategies for the English Language Course Interactive Language Practice: Engage learners in communicative activities that promote active participation and practical language use. Strategies include pair work, group discussions, role-plays, and language games, which are designed to foster speaking and listening skills in an engaging and supportive environment.



	Use of Authentic Materials: Integrate authentic materials such as videos, audio recordings, and reading texts that reflect real-life language use. These materials help learners develop their listening, speaking, reading, and writing skills by exposing them to various dialects, accents, and real-world contexts. Task-Based Learning: Design tasks and projects that require learners to use the target language to accomplish specific objectives or solve problems. This approach promotes meaningful language use, encouraging learners to think critically and develop problem-solving skills while using English in practical scenarios. Visual Aids and Multimedia: Utilize visual aids, such as charts, diagrams, and multimedia resources, to enhance language learning and comprehension. These tools aid in vocabulary acquisition, provide context, and support understanding, making abstract concepts more concrete and accessible. Error Correction and Feedback: Provide timely and constructive feedback on learners' language production, focusing on both strengths and areas for improvement. Encourage self-correction and peer correction, fostering a supportive learning environment where students can learn from their mistakes and from each other. This approach helps build confidence and promotes a growth mindset.
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Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation تقييم المادة الدراسية				
	Time/Nu	Weight (Marks)	Week Due	Relevant Lear.....



		Number			Outcome
Formative assessment	Quizzes	3	15% (15)	5, 10, 14	LO #1, 2, 8 and 7
	Assignments	3	15% (15)	2, 9, 13	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	10% (10)	14	LO # 1-7
Summative assessment	Midterm Exam	2 hours	10% (10)	7	LO # 1-4
	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Grammar: Auxiliary Verbs (Intermediate: Unit 1) Vocabulary: Everyday Expressions (Intermediate: Unit 1) Reading: "It's a Wonderful World!" (Intermediate: Unit 1) Writing: Basic sentences using auxiliary verbs (Intermediate: Unit 1)
Week 2	Grammar: Present Simple (Intermediate: Unit 2) Vocabulary: Common Activities (Intermediate: Unit 2) Reading: "Get Happy!" (Intermediate: Unit 2)
Week 3	Grammar: Present Continuous (Intermediate: Unit 2) Vocabulary: Actions and Activities (Intermediate: Unit 2) Reading: "Simple or Continuous?" (Intermediate: Unit 2)
Week 4	Grammar: Past Simple (Intermediate: Unit 3) Vocabulary: Telling Stories (Intermediate: Unit 3) Reading: "Telling Tales" (Intermediate: Unit 3) Writing: Writing a short story using past simple tense (Intermediate: Unit 3)
Week 5	Grammar: Present Perfect (Intermediate: Unit 1, 3) Vocabulary: Experiences and Achievements (Intermediate: Unit 1, 3) Reading: "Present Perfect Stories" (Intermediate: Unit 1, 3)
Week 6	Grammar: Future Forms (Intermediate: Unit 5) Vocabulary: Plans and Predictions (Intermediate: Unit 5) Reading: "On the Move" (Intermediate: Unit 5)
Week 7	Grammar: Questions and Negatives (Intermediate: Unit 4) Vocabulary: Social Interactions (Intermediate: Unit 4) Reading: "Nothing but the Truth" (Intermediate: Unit 4)
Week 8	Grammar: Modals (Intermediate: Unit 4, 7) Vocabulary: Permissions and Possibilities (Intermediate: Unit 4, 7; Upper-Intermediate: Unit 7) Reading: "Doing the Right Thing" (Intermediate: Unit 4; Upper-Intermediate: Unit 7)



	Unit 7 "Getting on Together")
Week 9	Grammar: Comparatives and Superlatives (Intermediate: Unit 6) Vocabulary: Describing Characteristics (Intermediate: Unit 6; Upper-Intermediate: Unit 6) Reading: "Making Comparisons" (Intermediate: Unit 6; Upper-Intermediate: Unit 6 "Making it Big") Writing: Comparative essay (Intermediate: Unit 6)
Week 10	Grammar: Conditionals (Intermediate: Unit 8) Vocabulary: Hypothetical Situations (Intermediate: Unit 8; Upper-Intermediate: Unit 8) Reading: "Just Imagine!" (Intermediate: Unit 8; Upper-Intermediate: Unit 8 "Going to Extremes")
Week 11	Grammar: Passive Voice (Intermediate: Unit 2, 3) Vocabulary: Actions and Consequences (Intermediate: Unit 2, 3; Upper-Intermediate: Unit 7) Reading: "Passive Constructions" (Intermediate: Unit 2, 3; Upper-Intermediate: Unit 7 "Getting on Together")
Week 12	Grammar: Relative Clauses (Intermediate: Unit 8) Vocabulary: Descriptive Details (Intermediate: Unit 8; Upper-Intermediate: Unit 8) Reading: "Descriptive Sentences" (Intermediate: Unit 8; Upper-Intermediate: Unit 8 "Going to Extremes")
Week 13	Grammar: Present Perfect Continuous (Intermediate: Unit 10) Vocabulary: Time Expressions (Intermediate: Unit 10; Upper-Intermediate: Unit 10) Reading: "Obsessions" (Intermediate: Unit 10; Upper-Intermediate: Unit 10 "Risking Life and Limb") Writing: Describing ongoing activities using present perfect continuous (Intermediate: Unit 10)
Week 14	Grammar: Reported Speech (Intermediate: Unit 11) Vocabulary: Reporting Verbs (Intermediate: Unit 11; Upper-Intermediate: Unit 11) Reading: "Reported Conversations" (Intermediate: Unit 11; Upper-Intermediate: Unit 11 "In Your Dreams")
Week 15	Review and Exam Preparation

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available at the Library
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Required Texts	• L. Soars and J. Soars, New Headway Plus - Intermediate, 4th ed. Oxford: Oxford University Press, 2019. • Soars, J., Soars, L. New Headway Plus: Upper-Intermediate. United Kingdom: Oxford University Press.	Yes
Recommended Texts	• Audio CDs or Online Audio: Recordings of listening exercises, dialogues, and pronunciation practice.	No
Websites	Collage E- Library	

Grading Scheme

مخطط الدرجات

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

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


 د. ه. أ. الكاظم
 العميد

عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 20



رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 20

Qammar Majan

اسم التدريسي: م.م. قمر مرجان

التاريخ : 2026 / 3 / 20

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية



Module Information					
معلومات المادة الدراسية					
Module Title	Laboratory Medical Instrumentation II		Module Delivery		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☒ Seminar		
Module Code	MIET2201				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		UGII			Semester of Delivery
Administering Department		MIET	College	EETC	
Module Leader	Hayder Fadhil Jawad		e-mail	haydershubber@gmail.com	
Module Leader's Acad. Title		Assistant Lecturer	Module Leader's Qualification		M.Sc.
Module Tutor	Hayder Fadhil Jawad		e-mail	haydershubber@gmail.com	
Peer Reviewer Name		Hayder Fadhil Jawad	e-mail	haydershubber@gmail.com	
Scientific Committee Approval Date	24/3/2026		Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Laboratory Medical Instrumentation I	Semester	UGII-S3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية



Module Aims أهداف المادة الدراسية	1. The graduate get scientific and applied skills to diagnosis the medical instruments faults. 2. The graduated students will gain the ability of knowledge of different parts of medical instruments. 3. Development and training the engineering technical staffs on the medical device maintenance. 4. Preparation of the research and studies to improve and develop the action of medical devices. 5. Put the proposals and alternatives for the medical devices. 6. To describe the types of laboratory medical instruments. 7. To explain the principal work of the laboratory medical devices techniques. 8. To understand the maintenance of laboratory medical devices and their electrical and mechanical faults.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the course, students should be able to: 1. Introduction about the laboratory Design, Rules and limitations. 2. Define, explain, and describe the centrifuge and understand the electrical and electronic parts. 3. Define, explain, and describe Microscope and understand the electrical and electronic parts. 4. List and recognize the types of microscopes. 5. Define, explain, and describe Polymerase chain reaction (PCR). and understand the electrical and electronic parts. 6. Definition of Laboratory incubators and explain their applications. 7. List and understand the types of Laboratory Incubators. 8. Define and explain Oven and its medical application. 9. Define and explain Autoclave and its medical application. 10. Describe and understand water distillation and its application with the medical field. 11. Definition and understanding of the CBC System. 12. Define the principle of CBC Medical system. 13. Faults and maintenance of medical instrumentations
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Medical instrumentation definition, analysis lists, work security rules, and best laboratory use guidelines [14hr]. Laboratory instruments criteria, types, components, advantages and disadvantages, physical and medical application. [12hr]. Medical instrumentation faults and maintenance, analysis li: security rules, and best laboratory use guidelines [14 hr]. 

	Explain Polymerase chain reaction (pcr) and definition of Laboratory incubators[14 hr]. Types of Laboratory Incubators and oven and its medical application[14hr]. Autoclave medical application and water distillation[14hr].
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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 design, while at the same time refining and expanding their medical instrumentations thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	81	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية				
	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
				

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Formative assessment	Quizzes	2	% (10)	3,10	LO # 1,2,3.....14 ,
	Assignments	2	% (10)	4,8	LO # 6,13
	Projects / Lab.	1	%(10)	6	LO #3
	Report	2	% (10)	5,9	LO # 7,12
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	14	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction about the laboratory Design.
Week2	Definition of Centrifuge
Week 3	Applications of Centrifuge
Week 4	Definition of Microscopes.
Week 5	Types of Microscopes.
Week 6	Water distillation
Week7	Mid Term exam
Week 8	Oven and its medical application.
Week 9	Autoclave and its medical application.
Week 10	Definition of Laboratory incubators.
Week 11	Types of Laboratory Incubators.
Week 12	Polymerase chain reaction (PCR).
Week 13	Applications of (PCR)
Week 14	Definition of Complete Blood Counter (CBC) Principle of (CBC)
Week 15	A preparatory week before final exam.



	Material Covered
Week 1	Introduction about the laboratory Design
Week 2	Centrifuge
Week 3	Microscopes.
Week 4	Types of Microscopes.
Week 5	Water distillation
Week6	Oven and its medical application.
Week7	Autoclave and its medical application.
Week 8	Laboratory Incubators.
Week 9	Polymerase chain reaction (PCR).
Week10	Complete Blood Counter (CBC)
Week11	Faults and maintenance of medical lab. instruments

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Biomedical device technology ,by ANTHONY Y. K. CHAN, MSc, MEng, PEng, CCE	
Recommended Texts	Ananthi ,2005,"A text book of medical instruments	
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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د. هارون عبد الكاظم شهد
عميد الكلية

عميد الكلية: أ.د. هارون عبد الكاظم شهد

التاريخ: 2026 / 3 / 24

د. محمود شاكر نصر

رئيس القسم: أ.د. محمود شاكر نصر

التاريخ: 2026 / 3 / 24

د. م. حيدر فاضل جواد

م. حيدر فاضل جواد

التاريخ: 2026 / 3 / 24





Third stage

UGIII



Level 3 – First semester

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Programming and Applications II		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MIET3105		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGIII	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Ehsan najeh shamran	e-mail	ehsannajeh1992@gmail.com
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	MSC
Module Tutor	Ehsan najeh shamran	e-mail	ehsannajeh1992@gmail.com
Peer Reviewer Name	Ehsan najeh shamran	e-mail	ehsannajeh1992@gmail.com
Scientific Committee Approval Date	22/3/2026	Version Number	2.0

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



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. Understanding the fundamental concepts of C++ programming language environment. 2. The students will understand and learn how to use C++ as an effective programming language. 3. The students will be able to solve different mathematical and engineering problems as well as design projects using code. 4. Students will acquire the knowledge of basic C++ syntax such as: variables, input, output, vectors, matrices, functions. 5. The students will gain the necessary skills to design and implement appropriate algorithms that solve problems dealing with different mathematical and engineering applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introducing the history and philosophy of C and C++, how C++ adds generic programming concepts to the C language, programming language standards, the mechanics of creating a program. 2. The students learn how to create a C++ program and the general format for a C++ program 3. The “# include directive”, the main() function, How to use the cout object for output, how to place comments in a C++ Program, how and when to use endl, how to declare and use variables, how to use the “cin” object for input, how to define and use simple functions. 4. Learn rules for naming C++ variables, C++ built-in integer types, numeric constants of various integer types, using the const qualifier to create symbolic constants, C++’s built-in floating-point types, C++’s arithmetic operators, automatic type conversions, forced type conversions (type casts). 5. How to create and use arrays, how to create and use C-style strings. 6. How to create and use string class strings, how to use the “getline()”. 7. Learn how to create and use structures, how to create and use pointers, how to create dynamic arrays, how to create dynamic structures, automatic, static, and dynamic storage. 8. Understand the for loop, expressions and statements, the increment and decrement operators: ++ and --, combination assignment operators, compound statements (blocks). 9. The if statement, the if else statement, logical operators: “&&”, “ ”, and “!”. the “ctype” library of character functions, the conditional operator, the statement, the continue and break statements, number-reading loops, l input/output. 

	10. The C++ view of input and output, the “iostream” family of classes redirection, ostream class methods, formatting output, “istream” class methods, stream states, file I/O, using the “ifstream” class for input from files, using the “ofstream” class for output to files, using the “fstream” class file input and output, command-line processing, binary files.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Introducing to the history and philosophy of C and of C++, How C++ adds object-oriented, concepts to the C language, How C++ adds generic programming concepts to the C language, programming language standards, and the mechanics of creating a program. How to create a C++ program, the general format for a C++ program the #include directive, the “main()” function, how to use the cout object for output, how to place comments in a C++ program, how and when to use “endl”, how to declare and use variables, how to use the “cin” object for input, and how to define and use simple functions. Rules for naming C++ variables, C++’s built-in integer types, Numeric constants of various integer types, Using the “const” qualifier to create symbolic constants, C++’s built-in floating-point types, C++’s arithmetic operators, automatic type conversions, and forced type conversions (type casts). [15 hrs] How to create and use arrays, how to create and use C-style strings ,how to create and use string class strings, How to use the “getline()” and how to create and use arrays, how to create and use C-style strings, how to create and use string class strings, How to use the “getline(): and “get()” methods for reading strings, How to mix string and numeric input, how to create and use structures, how to create and use pointers, how to create dynamic arrays, and how to create dynamic structures, automatic, static, and dynamic storage. The for loop, Expressions and statements, The increment and decrement operators: ++ and --, Combination assignment operators, Compound statements (blocks), The comma operator, Relational operators: > , >= , == , <= , < , and !=, The while loop, The do while loop, The get() character input method, The end-of-file condition, Nested loops and two-dimensional arrays.[15 hrs] The if statement, The if else statement, Logical operators: && , , and !, The ctype library of character functions, The conditional operator: ?:. The switch statement, the continue and break statements, number-reading loops, and basic File input/output [10 hrs] The C++ view of input and output, the “iostream” family of classes Redirection, “ostream” class methods, formatting output, “istream” class methods, stream states, file I/O, using the “ifstream” class for input from files, using the “ofstream” class for output to files, using the “fstream” class file input and output, command line processing, binary files, and random file access. [15 hrs] Revision problem classes [5 hrs]



Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	5 and 10	LO #1, #2 and #10,
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Project/Lab	5	10% (10)	2 and 13	LO #2, #4 and #5, #9
	Report	N/A			
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Introducing history and philosophy of C and C++, How C++ adds object-oriented, concepts to the C language, How C++ adds generic programming concepts to the C language, Programming language standards, and the mechanics of creating a program.
Week 2	How to create a C++ program, general format for a C++ program, “#include” directive, The main() function, how to use the “cout” object for output, how to place comments in a C++ program, how and when to use “endl”, how to declare and use variables, how to use the “cin” object for input, and how to define and use simple functions.
Week 3 &4	Rules for naming C++ variables, C++’s built-in integer types, numeric constants of various integer types, using the “const” qualifier to create symbolic constants, C++’s built-in floating-point types, C++’s arithmetic operators, automatic type conversions, and forced type conversions (type casts).
Week 5	How to create and use arrays, how to create and use C-style strings, how to create and use string class strings, how to use the “getline()” and “get()” methods for reading strings,
Week 6	How to mix string and numeric input, how to create and use structures, how to create and use pointers, and how to create dynamic arrays. How to create dynamic structures, automatic, static, and dynamic storage.
Week 7	Mid-term Exam
Week 8	The for loop, Expressions and statements, increment and decrement operators: ++ and --, combination assignment operators, compound statements (blocks), comma operator, and relational operators: > , >= , == , <= , < , and !=.
Week 9	While loop, do “while” loop, and “get()” character input method.
Week 10	The end-of-file condition, nested loops and two-dimensional arrays.
Week 11	if statement, if else statement, logical operators: && , , and !”, “ctype” library of character functions, and conditional operator: ?.
Week 12	“Switch” statement, “continue” and “break” statements, number-reading loops, and basic File input/output.
Week 13 &14	C++ view of input and output, the “io-stream” family of classes redirection, “io-stream” class methods, formatting output, “io-stream” class methods, stream states, file I/O, using the “ifstream” class for input from files, and using the “ofstream” class for output to files.
Week 15	Command-line processing, binary files, random file access, and “Incore” formatting Preparatory week before the final Exam



Delivery Plan (Weekly Lab. Syllabus) المناهج الأسبوعي للمختبر	
	Material Covered
Week 1	Introduction, C++ Environment.
Week 2	The general format for a C++ program, the #include directive, The main() function, how to use the cout object for output, How to place comments in a C++ Program, how and when to use endl, how to declare and use variables, how to use the cin object for input, and how to define and use simple functions.
Week 3	
Week 4	
Week 5	Variables and assignment statement, logical operator.
Week 6	Using the const qualifier to create symbolic constants, C++'s built-in floating-point types, and C++'s arithmetic operators.
Week 7	
Week 8	Arrays, Built in functions, Basic Matrix Functions
Week 9	
Week 10	Control Statements(Conditional statements: If, Else, Elseif, switch case)
Week 11	
Week 12	How to create dynamic structures, automatic, static, and dynamic storage.
Week 13	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	P.B. Mahapatra "C++"	yes
Recommended Texts	A Complete Guide to Programming in C++ Ulla Kirch-Prinz Peter Prinz	
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering http://www.lmpt.univ-tours.fr/~volkov/C++.pdf	



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

أ.د. هارون عبد الكاظم شهد
العميد

عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 22

رئيس القسم : أ.د. محمود شاكر نصر

رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 22

اسم التدريسي: م.م احسان ناجح شمرا

اسم التدريسي: م.م احسان ناجح شمرا

التاريخ : 2026 / 3 / 22

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Electromagnetic Fields	Module Delivery
Module Type	Core	☒ Theory



Module Code	MIET 3103			☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGIII	Semester of Delivery		5
Administering Department		MIET	College	EETC	
Module Leader	Hussein F. Hamdan		e-mail	eng.hussain.fadhle@uobabylon.edu.iq	
Module Leader’s Acad. Title		professor	Module Leader’s Qualification		Ph.D.
Module Tutor			e-mail		
Peer Reviewer Name	Hussein F. Hamdan		e-mail	eng.hussain.fadhle@uobabylon.edu.iq	
Scientific Committee Approval Date	26/10/2023		Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Engineering Mathematics	Semester	UGII-S3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To learn about electromagnetic transmission 2. To learn about Maxwell's equations 3. To know the types of electromagnetic wave transmission media. 4. To recognize the types of signals and systems. 5. To recognize the Guided Waves 6. To recognize transmission lines 7. To recognize Electromagnetic Radiation and Antennas
Module Learning Outcomes	1. Learn about General review in electrostatic. 2. Learn about Gauss's law. 3. Learn about Steady magnetic field. 4. Learn about Time varying magnetic field.



مخرجات التعلم للمادة الدراسية	5. Learn about Maxwell's equations in electric fields. 6. Learn about Maxwell's equations in magnetic fields. 7. Recognize types of electromagnetic wave transmission media. 8. Recognize the types of signals and systems for electromagnetic waves. 9. Recognize the introduction Guided Waves. 10. Recognize the applications Guided Waves in medical device. 11. Recognize transmission lines. 12. Recognize Electromagnetic Radiation and Antennas.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: 1- Electrostatic, Electric charge, Coulomb's law, Electrical field intensity, and examples [4 H]. 2- Electric Flux Density and Gauss's Law with examples [4 H]. 3- Steady Magnetic Field, Magnetic Field in life's human with examples [4 H]. 4- Time varying - magnetic field and Maxwell's equations, FARADAY'S LAW, Moving Conductor in a Magnetic Field, Displacement Current and Conduction Current (Ampere's Law), Maxwell's equations in pointing form, Wave equations with examples [12 H]. 5- Uniform plane wave, Wave velocity, Characteristic impedance, Wave propagation in media, Skin effect, The pointing vector and power consideration with examples [8 H]. 6- Guided Waves with examples [12 H]. 7- Transmission lines with examples [8 H]. 8- Electromagnetic Radiation and Antennas with examples [12 H].

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lectures - means of clarification - intellectual questions - scientific exhibitions - scientific competitions

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	
Total SWL (h/sem)	125		

الحمل الدراسي الكلي للطالب خلال الفصل	
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Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10 %(10)	3,5,7,9,11,13	LO # 1, 2 LO # 3, 4 LO # 5, 6 LO # 7, 8 LO # 9, 10 LO # 11, 12
	Assignments	2	10 %(10)	5,13	LO # 3-6, and 6-9
	Projects / Lab.	10	15 %(10)	Continuous	
	Report	1	5 %(10)	14	LO # 1-12
Summative assessment	Midterm Exam	2hr	10 %(10)	7	LO # 1-7
	Final Exam	4hr	50 %(50)	16	ALL
Total assessment			100 % (100)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General review in electrostatic
Week 2	Gauss's law
Week 3	Steady magnetic field
Week 4	Time varying magnetic field
Week 5-6	Maxwell's equations
Week 7	Midterm exam
Week 8	Plane Wave Propagation and Reflection



Week 9-11	Guided Waves
Week 12-13	Transmission lines
Week 14-15	Electromagnetic Radiation and Antennas Preparing for final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	General review in electrostatic
Week 2	Gauss's law
Week 3	Steady magnetic field
Week 4	Time varying magnetic field
Week 5-6	Maxwell's equations
Week 7-8	Plane Wave Propagation and Reflection
Week 8-10	Guided Waves
Week 11-12	Transmission lines
Week 13-14	Electromagnetic Radiation and Antennas

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Engineering Electromagnetic (fifth edition – by William H. Hayt. JR)	NO
Recommended Texts	Introduction to Communication Systems (second edition- by Ferrel. G. Stremler)	YES
Websites	1. https://www.coursera.org/search?query=Electromagnetic%20Fields&=&index=prod_all_launched_products_for_m_optimization . 2. www.tallguide.com	



	3. www.ainfoinc.com 4. www.millitech.com 5. www.rfcafe.com 6. www.globalspec.com
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Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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



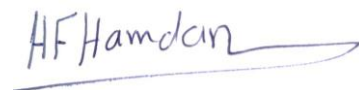
عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 15



رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15



اسم التدريسي : أ.د. حسين فاضل حمدان

التاريخ : 2026 / 3 / 15

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Medical Diagnostic Instrumentation I	Module Delivery
Module Type	Core	☒ Theory



Module Code	MIET3101			Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		UGIII	Semester of Delivery		5
Administering Department		MIET	College	EETC	
Module Leader	Hayder Fadhil Jawad		e-mail	haydershubber@gmail.com	
Module Leader’s Acad. Title		Assistant Lecturer	Module Leader’s Qualification		M.Sc.
Module Tutor	Hayder Fadhil Jawad		e-mail	haydershubber@gmail.com	
Peer Reviewer Name		Hayder Fadhil Jawad	e-mail	haydershubber@gmail.com	
Scientific Committee Approval Date	24/3/2026		Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Anatomy & Physiology	Semester	UGII - S3
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 module aims: 1. To generate a grounding knowledge base for the students which allows them understanding the technology and principles applied in a medical environment. 2. To understand the nature of physiological signals and how they can be acquired, analysed and visualised. 3. To provide a grounding in the theory of biomedical mea systems, including sensors, signal conditioning methods, mea techniques, patient interfacing and instrumentation biomedicine. 

	4. To introduce students to design strategies of biomedical devices. 5. To develop prototypes of medical instruments in an accompanying laboratory session. 6. To demonstrate how modern biomedical instruments combine traditional instrumentation techniques and technological innovation, including software presentation and analysis of data. 7. To be able to enter a wide range of medical related industries, clinical environments or professional biomedical research programs.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, students should be able to: 1. (a). Understanding the principles of operation of important sensors used in biomedical instrumentation and measurement. (b). Understanding the technical specifications of commercially produced sensors used for this purposes. 2. (a). Being able to specify and design instrumentation and measurement systems that employ these sensors and which, as appropriate, enable safe interface with the human body.(b). Recognised and understand the characteristics of the physiological signals being measured; 3. (a). Being able to offer realistic solutions to clinical measurement problems and to justify the choices. (b). Having a sufficient knowledge in the subject to be able to investigate and evaluate new designs of biomedical sensors and instruments. (c) Explain the operating principles of biomedical transducers for the measurement of biopotentials (ECG, EMG, EEG, EOG) and other critical physiological variables such as blood pressure, flow, and temperature. 4. (a) Design and build analog signal conditioning circuits that provide reliable biopotential measurements, e.g.ECG .(b) Explain the physical principles underlying the function of biopotential electrodes; (c) Demonstrate knowledge of electrical safety considerations in the medical environment. 5. (a) A respirometer is a device used to measure the rate of respiration of a living organism by measuring its rate of exchange of oxygen and/or carbon dioxide. They allow investigation into how factors such as age, or chemicals affect the rate of respiration. (b).The patient monitoring systems in healthcare are collections of machines or equipment used to constantly monitor patients through various vital signs and warning systems to detect and record changes in patient wellbeing. 6. Ambulatory monitors are devices that record the electrical activity in your heart. These are used to detect heart rhythm problems over a longer period of time, and you can take them home with you. They're an invaluable tool when it comes to diagnosing problems that are unpredictable and outside of a medical setting. 7. Electronic fetal monitoring is a procedure in which instruments are used to



	continuously record the heartbeat of the fetus and the contractions of the woman's uterus during labor. 8. An endoscope is an inspection instrument composed of image sensor, optical lens, light source and mechanical device, which is used to look deep into the body by way of openings such as the mouth or anus. 9. There are many direct and indirect (noninvasive) methods of measuring cardiac output. Several instruments can measure blood pressure quickly and with little discomfort. A sphygmomanometer is commonly used. 10. There are three different types of eye exams, including a comprehensive eye exam, a routine eye exam, and a contact lens exam. 11. Pulmonary function tests (PFTs) are noninvasive tests that show how well the lungs are working. The tests measure lung volume, capacity, rates of flow, and gas exchange. 12. Patients who have a tumor in or around the ear may undergo audiometry testing to determine whether hearing loss has occurred or to monitor their hearing before and after surgery. 13. (a). An arterial blood gas (ABG) test measures the levels of oxygen and carbon dioxide in your blood as well as the pH balance in your blood. (b). The blood cell counter measure of the number of red blood cells, white blood cells, and platelets in the blood. 14. (a). Hospitals can ensure patient safety and prevent untoward harm to patients who seek treatment with these steps. (b). Apply safety standards and select disposal method and procedures for electrical diagnostic equipment.
Indicative Contents المحتويات الإرشادية	The indicative contents of module include: <u>Biopotential amplifiers:</u> Physiological quantities, basic concepts and principles of medical instrumentation Bio-potentials, electrodes and amplifiers, static and dynamic characteristics of measurement systems, noise and noise reduction, sensor characterization. [5 hr.] <u>Instrumentation amplifier:</u> Signal conditioning. Digital/analog conversion Electrodes (Oxidation/reduction, electrolytes, electrode electrical models) Advanced conditioning circuits (noise, interference, shielding, active shielding, driven right leg active ground). Sensing displacement (strain gauges, LVDTs, piezocrystals, MEMS accelerometers and gyroscopes, optical * Bridges (no bridge; 1/4, 1/2, full * Electrical safety [10 hrs] 

	<u>Introduction to sensors and signal processing:</u> transducers, sensors and instruments; calibration; accuracy and error; amplifiers; filters; software and hardware signal processing. Nature of biomedical signals: physical signals (force, torque, flow, pressure as well as thermal, geometric and kinematic quantities); biopotentials; chemical signals. [10 hr.] <u>Medical measurement systems:</u> (EEG, ECG, EMG, EOG,...) Measurement constraints in the clinical environment, invasive and non-invasive measurements, Biomedical and chemical biosensors, Measurement of blood pressure, flow and volume, pulse oximetry and respiratory performance; Clinical laboratory instrumentation, and applications in patient monitoring. [15 hrs] <u>Protection and safety:</u> medical ethics; mechanical safety; electrical safety; biological hazards; chemical safety; radiation protection. [5 hrs] <u>Introduction to sensors and signal processing:</u> transducers, sensors and instruments; calibration; accuracy and error; amplifiers; filters; software and hardware signal processing. (b). Nature of biomedical signals: physical signals (force, torque, flow, pressure as well as thermal, geometric and kinematic quantities); biopotentials; chemical signals. Transducers of biomedical signals and their application: biopotential electrodes and amplifiers; pressure sensors; flow sensors; optical sensors; electrochemical sensors. [15 hrs].
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The learning and teaching strategies employed in this module can vary depending on the specific course. However, here are some common strategies that may be used with this course: <u>Teaching methods include:</u> • lectures • seminars • tutorials • lab experiments • design assignments • industrial visits • professional training 

	- a variety of projects Assessment : methods of assessment include a combination of: - coursework - group project reports - lab reports - written exams.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	12	15% (10)	Continuous	
	Report	1	5% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4 hr	50 % (50)	16	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Fundamentals of Medical Instrumentation.
Week 2	Bioelectric Signals and Electrodes, Physiological Transducers, Recording System.
Week 3	Biomedical Recorders.(ECG, EMG,EEG,EOG,VCG,PCG,.....etc.).
Week 4	Respiratory System Measurements, Respiration Monitoring and Apnea Detection, Oximeters.
Week 5	Patient Monitoring Systems, Coronary Care Unit (CCU).
Week 6	Arrhythmia and Ambulatory Monitoring Instruments.
Week 7	Midterm exam
Week 8	Foetal Monitoring Instruments/Systems.
Week 9	Blood Flow and Cardiac Output Measurements and Devices. Endoscopy.
Week 10	Advanced Vision and Eye Testing Instruments
Week 11	Pulmonary Function System.
Week 12	Pulmonary Function System.
Week 13	Equipment for Diagnostic Audiology and Hearing Tests.
Week 14	Patient Safety, Regulations and Safety Measures.
Week 15	Recap and Final Assessments: Review of the Entire Syllabus, Revision Sessions, and Preparing for final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to the Medical diagnostic instrumentation lab.
Week2	Biomedical signals recorders (ECG)
Week3	Biomedical signals recorders (ECG)
Week 4	Biomedical signals recorders (EMG, EEG , ERG, EOG).
Week 5	Equipments for patient monitoring systems, (CCU), and ambulatory monitoring ins
Week 6	Equipments for foetal monitoring system.



Week 7	Equipments for cardiac output measurements..
Week 8	Equipments for blood flow measurement.
Week 9	Endoscopy.
Week 10	Advanced vision and eye testing instruments (Ophthalmoscopy, Retinoscopy, Ocular tonometry, Slit lamp, Optical coherence tomography,.....etc).
Week 11	Advanced vision and eye testing instruments (Ophthalmoscopy, Retinoscopy, Ocular tonometry, Slit lamp, Optical coherence tomography,.....etc).
Week 12	Pulmonary function testing equipments and machines (Spirometer, Body plethysmograph., Pulmonary gas analyzer, Gas-conditioning device, Blood gas analyzer, Silverman pneumotachometer, Pulse oximeter,.....etc).
Week 13	Equipments for diagnostic audiology (ABR, AOE, Audiometers, Tympanometer, Hearing aid fitting systems, Balance testing equipment..... etc).
Week 14	Equipments for diagnostic audiology (ABR, AOE, Audiometers, Tympanometer, Hearing aid fitting systems, Balance testing equipment..... etc).
Week 15	Preparatory week before the final exam.
Week 16	Final test.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1. Khandpur , R. S. (1990) . Handbook of Biomedical Instrumentation , Tata McGraw Hill Publishing Co. 2. Joseph D. Bronzino (2006). The Biomedical Engineering Handbook, 3rd. Edition. Germany: Taylor & Francis.	Yes
Recommended Texts	1. Press.Joseph D. Bronzino (2006). Medical Devices and Human Engineering. (2017). United Kingdom: CRC Press. 2. Khandpur, R. S. (2004). Biomedical Instrumentation: Technology and Applications. India: McGraw Hill LLC. 3. Brown, J. M., Carr, J. J. (2001). Introduction to Biomedical Equipment Technology. India: Prentice Hall.	No
Websites		

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


 أ.د. هارون عبد الكاظم
 العميد

عميد الكلية: أ.د. هارون عبد الكاظم شهد

التاريخ: 2026 / 3 / 24



رئيس القسم: أ.د. محمود شاكر نصر

التاريخ: 2026 / 3 / 24



اسم التدريسي: م.م حيدر فاضل جواد

التاريخ: 2026 / 3 / 24

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Microprocessor		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab Tutorial Practical Seminar	
Module Code	MIET3102			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UGIII	Semester of Delivery	5	
Administering Department	MIET	College	EETC	
Module	Prof Dr. Mahmoud Shaker Nasr	e-mail	Eng.mahmoud.shaker@uobabylon.edu	



Leader			.iq
Module Leader's Acad. Title	Prof Dr.	Module Leader's Qualification	Ph.D.
Module Tutor	Prof Dr. Mahmoud Shaker Nasr	e-mail	Eng.mahmoud.shaker@uobabylon.edu.iq
Peer Reviewer Name	Prof Dr. Mahmoud Shaker Nasr	e-mail	Eng.mahmoud.shaker@uobabylon.edu.iq
Scientific Committee Approval Date	15/3/2026	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Digital electronics	Semester	UGII-S4
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1- The student knows the definition of Microprocessor 8086 . 2- How to engage colleagues and stakeholders in managing information, knowledge and communication systems. 3. Design and implementation of 8086 microprocessors. 4- Principles, methods, tools and techniques for keeping information, knowledge and communication secure and how to establish appropriate security levels and approaches. 5- How to evaluate current information, knowledge and communication systems and their capability and capacity to meet future needs. 6- Information, knowledge and communication technologies, their features and benefits for your needs. 7- Suppliers of information, knowledge and 8086MP and their capabil
Module Learning	Upon completion of the course, students should be able to:



Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the difference between microprocessor and microcontroller 2- Understand application of microprocessor in medical devices 3- Know characteristics of 8086 microprocessor 4- Know the architecture of 8086 microprocessor 5- Know the pins of 8086 microprocessor IC 6- Know the op-code of instructions 7- Know how to transfer data between memory and processor programmatically 8- Know how to build program to execute any arithmetic operation 9- Know how to build program to execute any logical operation 10- Know how to build program by using branching instruction for multitask 11- Know how to calculate time delay of any program code 12- Know how to draw time diagram of any instruction 13- Know the types of memories
Indicative Contents المحتويات الإرشادية	1. Microprocessor , microcontroller (6hrs) 2. Microprocessor architecture, registers, accumulator, flag (8hrs) 3. Carry, axillary carry, parity(4 hrs) 4. Stack pointer, decoder, arithmetic/logic unit(6hrs) 5. Interrupt, serial I/O, address buffer, bus organization (6hrs) 6. Direct memory access, hold acknowledge (4 hrs) 7. Instructions, data transfer instructions (8hrs) 8. Arithmetic, logical, branching, control instructions (15hrs) 9. Time diagram, time delay, opcode (6hrs)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Daily assessment - weekly assessment - quarterly assessment - objective questions - general questions - practical tests.

Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/sem)	94	Structured SWL (h/w)	6
الحمل الدراسي المنتظم للطالب خلال الفصل		الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem)	56	Unstructured SWL (h/w)	4
الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem)	150		
الحمل الدراسي الكلي للطالب خلال الفصل			
Module Evaluation			
تقييم المادة الدراسية			





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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to microprocessor and microcomputer
Week 2	MP architecture
Week 3	MP IC pins
Week 4	bus signal
Week 5	Introduction to Instruction set MP and addressing mode
Week 6	Data transfer instructions
Week 7	Mid-term Exam +
Week 8	Arithmetic instructions
Week 9	Logical instructions
	Branching instructions
Week 10	Review instructions and Tutorial
Week 11	Op-code and machine cycle
Week 12	Timing diagram of instructions
Week 13	Time delay of code
Week 14	Types and architecture for memory
Week 15	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر



	Material Covered
Week 1	Lab 1: introduction to 8086 simulator
Week 2	Lab 2: move data
Week 3	Lab 3: ADD two data
Week 4	Lab 4: SUB two data
Week 5	Lab 5: multiplication of two 8-bit data
Week 6	Lab 6: division of two 8-bit data
Week 7	Lab 7: OR , AND two data
Week 8	Lab 8: largest number
Week 9	Lab 9: smallest number
Week 10	Lab 10: copy memory locations array
Week 11	Lab 11: count blank memory locations
Week 12	Lab 12: exchange two memory locations array
Week 13	Lab 13: find first and second complement
Week 14	Lab 14: rotate 8-bit data

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Recommended Texts	Microprocessor Architecture, Programming and Applications with the 8086 (6th Edition)	NO
Websites	https://www.mediafire.com/file/xnu0xhfknbp9bml/sim8086_win_7.rar/file	

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 er
	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.



د. هارون عبد الكاظم الحميد

عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 15



رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15



اسم التدريسي: أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Project Management		Module Delivery
Module Type	Support		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☒ Seminar
Module Code	MIET3106		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGIII	Semester of Delivery	5
Administering Department	MIET	College	Engineering Technologies
Module Leader	Morteza Abbas Imran		e-mail: mortezaabbas@hilla-unc.edu.iq



Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	MSc
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	15/3/2026	Version Number	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1. Introduce the fundamental concepts and principles of project management. 2. Develop an understanding of project planning, scheduling, and controlling techniques. 3. Explore cost accounting methods and their application in project management. 4. Gain knowledge of machine replacement, materials handling, and inventory control in projects 5. Learn about time management techniques and their significance in project management.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Define and explain the key elements, objectives, and phases of project management. 2. Apply project planning, scheduling, and controlling techniques effectively. 3. Utilize project planning techniques such as Gantt charts, Critical Path (CPM), and Project Evaluation and Review Technique (PERT). 4. Understand the concept of crashing project networks to expedite project



	completion. 5. Apply cost accounting methods, including unit cost calculations and break-even analysis. 6. Demonstrate knowledge of depreciation accounting methods: straight-line, sum-of-years digits, reducing balance, and double-declining balance. 7. Evaluate machine replacement decisions in project management. 8. Analyze materials handling strategies in project environments. 9. Apply Material Requirements Planning (MRP) concepts in project settings. 10. Understand inventory control techniques and their relevance to project management. 11. Implement time management strategies to optimize project efficiency.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduction to Project Management: Elements, Objectives, and Phases(5) 2. Planning and Controlling in Projects(5) • Planning • Scheduling • Controlling 3. Project Planning Techniques(5) • Gantt chart • Critical Path Method (CPM) • Project Evaluation and Review Technique (PERT) 4. Crashing of Project Network(5) 5. Cost Account Methods(5) • Unit Cost Calculations • Break-Even Analysis Method 6. Depreciation Accounting Methods(5) • Straight-line Method • Sum-of-Years Digits (SOYD) Method • Reducing Balance (RB) Method • Double-Declining Balance (DDB) Method 7. Machine Replacement(2) 8. Materials Handling(2) 9. Material Requirements Planning (MRP) (2) 10. Inventory Control(2) 11. Time Management(2)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم



Strategies	
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	• Lectures to introduce key concepts and theories. • Case studies and practical examples to illustrate application in real-world scenarios. • Group discussions and activities to promote active learning and collaboration. • Assignments and projects to apply learned techniques and tools. • Continuous Feedback: Provide regular feedback to support student progress and understanding.
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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
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	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)		



Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Project Management: Introduction, Elements, Objectives and Phases
Week 2	Planning and Controlling in Projects: Planning, Scheduling and Controlling
Week 3	Project Planning Techniques - Gantt chart
Week 4	Project Planning Techniques - Critical Path Method (CPM)
Week 5	Project Planning Techniques - Project Evaluation and Review Technique (PERT)
Week 6	Crashing of project network Cost Account Methods (Unit Cost Calculations)
Week 7	Mid-Exam
Week 8	Cost Account Methods (Break Even Analysis Method)
Week 9	Depreciation Accounting Methods: (1) Straight-line Method (2) Sum-of- Years Digits (SOYD) Method
Week 10	Depreciation Accounting Methods: (3) Reducing Balance (RB) Method (4) Double-Declining Balance (DDB) Method
Week 11	Machine Replacement
Week 12	Materials Handling
Week 13	Material Requirements Planning (MRP)
Week 14	Inventory Control
Week 15	Time Management Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Project Management: Introduction, Elements, Objectives and Phases
Week 2	Planning and Controlling in Projects: Planning Scheduling Controlling
Week 3	Project Planning Techniques Gantt chart
Week 4	Project Planning Techniques



	Critical Path Method (CPM)
Week 5	Project Planning Techniques Project Evaluation and Review Technique (PERT)
Week 6	Crashing of project network
Week 7	Cost Account Methods Unit Cost Calculations
Week 8	Cost Account Methods Break Even Analysis Method
Week 9	Depreciation Accounting Methods: (1) Straight-line Method (2) Sum-of- Years Digits (SOYD) Method (3) Reducing Balance (RB) Method Double-Declining Balance (DDB) Method
Week 10	Machine Replacement
Week 11	Materials Handling
Week 12	Material Requirements Planning (MRP)
Week 13	Inventory Control
Week 14	Time Management

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Project Management: A Systems Approach to Planning, Scheduling, and Controlling" by Harold Kerzner	Yes
Recommended Texts	"Project Management: The Managerial Process" by Clifford Gray and Erik Larson	No
Websites	Lecture Slides: Prepared lecture slides covering the key concepts, frameworks, and techniques of project management will be provided to students.	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors



	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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


د. أ. هارون عبد الكاظم
الحمد

عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 15



رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15



اسم التدريسي : م.م. مرتضى عباس عمران

التاريخ : 2026 / 3 / 15

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	Signals and Systems		Module Delivery	
Module Type	Core		Theory ☐	
Module Code	MIET3104		☐ Lecture	
ECTS Credits	5		Lab ☐	
SWL (hr/sem)	125		☐ Tutorial ☐ Practical ☐ Seminar	
Module Level	UGIII	Semester of Delivery		5
Administering Department	MIET	College	EETC	
Module Leader	MS.c. Sajdeen K. Dawood		e-mail	sajdeen.k@s.uokerbal



Module Leader's Acad. Title		Module Leader's Qualification	Master
Module Tutor	MS.c. Sajdeen K. Dawood	e-mail	sajdeen.k@s.uokerbala.edu.i
Peer Reviewer Name	MS.c. Sajdeen K. Dawood	e-mail	sajdeen.k@s.uokerbala.edu.i
Scientific Committee Approval Date	2026/3/22	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Engineering Mathematics	Semester	UGII-S3
Co-requisites module	None	Semester	



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	✓ Understand and classify signals based on their characteristics and properties ✓ Study basic continuous-time and discrete-time signals to establish a foundation for signal analysis ✓ Analyze systems and classify them according to their characteristics and behavior ✓ Investigate the response of continuous-time LTI systems using convolution integral and understand its implications for signal processing ✓ Explore the properties and behaviors of LTI systems described by differential equations or difference equations to model and analyze real-world systems ✓ Learn the Laplace Transform and its applications in analyzing continuous-time signals and systems ✓ Understand the concept of the system function in the Laplace domain and its role in analyzing continuous-time LTI systems ✓ Study the Z-Transform and its applications in analyzing discrete-time signals and systems ✓ Understand and represent periodic signals using Fourier series ✓ Analyze continuous-time signals using the Fourier transform ✓ Explore properties of the continuous-time Fourier transform ✓ Study the frequency response of continuous-time LTI systems, including filtering and bandwidth ✓ Investigate Fourier analysis of discrete-time signals and systems
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, students should be able to ✓ Demonstrate a comprehensive understanding of signal types ✓ Demonstrate a systematic knowledge of the classification of signals ✓ Gain the ability to analyze basic continuous-time and discrete-time signals effectively ✓ Demonstrate an understanding of the principles of LTI system ✓ Learn how to use the Laplace transform for signal and system analysis in the frequency domain ✓ Demonstrate an understanding of time analysis of signals and systems ✓ Demonstrate an understanding of frequency analysis of signals and systems ✓ Critically evaluate the LTI system response ✓ Ability to transform signal and system Z domain ✓ Demonstrate the techniques of synthesize signals using Fourier series
Indicative Contents المحتويات الإرشادية	Signals and classification of signals, basic continuous-time signals, basic discrete-time signals [7 hrs] Systems and classification of systems, response of a continuous-time LTI system and the convolution integral, properties of continuous-time LTI systems, eigenfunctions of continuous-time LTI systems, systems described by differential equations, response of a discrete-time LTI system and convolution sum, properties and eigenfunctions of discrete-time LTI systems [10 hrs] The Laplace transforms, Laplace transform of some common signals, properties of the Laplace transform, the inverse Laplace transform, the system function, the unilateral Laplace transform. The z-transform, z-transform of some common sequences. properties of the z-transform, the inverse z-transform, the system function c time LTI systems, the unilateral z- transform Fourier Analysis of Continuous-Time Signals and Systems, Fourier series representation of periodic signals the Fourier transform, properties of the continuous-time Fourier transform. The 

	frequency response of continuous-time LTI systems. Fourier Analysis of Discrete-Time Signals and Systems, discrete Fourier series, the Fourier transform and its properties. .System response to sampled continuous-time sinusoids [17 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The major strategy for presenting this module will be to encourage students to participate in the tasks while also polishing and improving their critical thinking skills. This will be accomplished through courses, interactive lectures, and the consideration of small experiments involving various sample tasks that are engaging to the students .and help them learn more about the module

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدرا يس المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدرا يس المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدرا يس غ ري المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدرا يس غ ري المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدرا يس الك يل للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	(15)%15	and 10 5	LO #1 and #9
	Assignments	2	(10)%10	and 12 2	LO #3 and #7
	.Projects / Lab	3	(10)%10	Continuous	All
	Report	2	(5)%5	13	LO #5
Summative assessment	Midterm Exam	2hr	(10)%10	7	LO #1 - #6
	Final Exam	4hr	(50)%50	16	All
Total assessment			%100		



Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	✓ SIGNALS AND CLASSIFICATION OF SIGNALS ✓ BASIC CONTINUOUS-TIME SIGNALS ✓ BASIC DISCRETE-TIME SIGNALS
Week 2	
Week 3	✓ SYSTEMS AND CLASSIFICATION OF SYSTEMS ✓ RESPONSE OF A CONTINUOUS-TIME LTI SYSTEM AND THE CONVOLUTION INTEGRAL ✓ PROPERTIES OF CONTINUOUS-TIME LTI SYSTEMS ✓ EIGENFUNCTIONS OF CONTINUOUS-TIME LTI SYSTEMS ✓ SYSTEMS DESCRIBED BY DIFFERENTIAL EQUATIONS ✓ RESPONSE OF A DISCRETE-TIME LTI SYSTEM AND CONVOLUTION SUM ✓ PROPERTIES OF DISCRETE-TIME LTI SYSTEMS ✓ EIGENFUNCTIONS OF DISCRETE-TIME LTI SYSTEMS ✓ SYSTEMS DESCRIBED BY DIFFERENCE EQUATIONS
Week 4	
Week 5	
Week 6	✓ THE LAPLACE TRANSFORM ✓ LAPLACE TRANSFORM OF SOME COMMON SIGNALS ✓ PROPERTIES OF THE LAPLACE TRANSFORM ✓ Mid Exam ✓ THE INVERSE LAPLACE TRANSFORM ✓ THE SYSTEM FUNCTION ✓ THE UNILATERAL LAPLACE TRANSFORM
Week 7	
Week 8	
Week 9	✓ THE Z-TRANSFORM ✓ Z-TRANSFORM OF SOME COMMON SEQUENCES ✓ PROPERTIES OF THE Z-TRANSFORM ✓ THE INVERSE Z-TRANSFORM ✓ THE SYSTEM FUNCTION OF DISCRETE-TIME LTI SYSTEMS ✓ THE UNILATERAL Z-TRANSFORM
Week 10	
Week 11	<u>Fourier Analysis of Continuous-Time Signals and Systems</u> ✓ FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS ✓ THE FOURIER TRANSFORM ✓ PROPERTIES OF THE CONTINUOUS-TIME FOURIER TRANSFORM
Week 12	✓ THE FREQUENCY RESPONSE OF CONTINUOUS-TIME LTI SYSTEMS ✓ FILTERING ✓ BANDWIDTH
Week 13	<u>Fourier Analysis of Discrete-Time Signals and Systems</u> ✓ DISCRETE FOURIER SERIES ✓ THE FOURIER TRANSFORM ✓ PROPERTIES OF THE FOURIER TRANSFORM
Week 14	✓ THE FREQUENCY RESPONSE OF DISCRETE-TIME LTI SYSTEMS ✓ SYSTEM RESPONSE TO SAMPLED CONTINUOUS-TIME SINUSOIDS
Week 15	✓ DIGITAL SIMULATION OF ANALOG SYSTEMS
Preparing for final exam	



Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الأسبوعي للمختبر	
	Material Covered
Week 1	SIGNAL REPRESENTATIONS
Week 2	RESPONSE OF A DISCRETE-TIME LTI SYSTEM AND CONVOLUTION SUM
Week 3	
Week 4	SYSTEMS DESCRIBED BY DIFFERENCE EQUATIONS
Week 5	
Week 6	PROPERTIES OF THE Z-TRANSFORM
Week 7	
Week 8	FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS
Week 9	
Week 10	DISCRETE FOURIER TRANSFORM
Week 11	
Week 12	THE FREQUENCY RESPONSE OF DISCRETE-TIME LTI SYSTEMS
Week 13	

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the ?Library
Required Texts		
Recommended Texts	S. Palani, SIGNALS AND SYSTEMS, Springer International Publishing, 2021	
Websites		



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



أ.د. هارون عبد الكاظم
عميد الكلية

أ.د. محمود شاكر نصر
رئيس القسم

م.م. ساجدين كاظم داود
اسم التدريسي

عميد الكلية : أ.د. هارون عبد الكاظم
شهد

رئيس القسم : أ.د. محمود شاكر نصر

اسم التدريسي: م.م. ساجدين كاظم داود

التاريخ : 2026 / 3 / 22

التاريخ : 222026 / 3 /

التاريخ : 2026 / 3 / 22



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Advanced Computer Programming		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MIET3206		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGIII	Semester of Delivery	S-6
Administering Department	MIET	College	EETC
Module Leader	Ehsan najeh shamran	e-mail	ehsannajeh1992@gmail.com
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	MSC
Module Tutor	Ehsan najeh shamran	e-mail	ehsannajeh1992@gmail.com
Peer Reviewer Name	Ehsan najeh shamran	e-mail	ehsannajeh1992@gmail.com
Scientific Committee Approval Date	22/3/2026	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	6. Introduce students to the fundamental concepts and principles of Python programming language. 7. Develop students' proficiency in writing Python code and solving programming problems. 8. Familiarize students with essential programming constructs, such as variables, data types, control flow structures, and functions. 9. Provide students with a solid foundation in object-oriented programming (OOP) and its application in Python. 10. Enable students to work with various data structures and perform operations on them. 11. Prepare students for practical application of Python in real-world scenarios, such as data manipulation, web scraping, and GUI development.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the fundamentals of Python programming language, including variables, data types, and basic operators. 2. Demonstrate proficiency in control flow structures, such as conditional statements and loops, to control program execution. 3. Develop functions and utilize function arguments to enhance code modularity and reusability. 4. Utilize exception handling techniques to effectively manage errors and ensure program robustness. 5. Gain familiarity with modules and packages to leverage existing code and extend Python's functionality. 6. Understand object-oriented programming (OOP) concepts and apply them to create classes, objects, and inheritance hierarchies. 7. Manipulate strings, lists, dictionaries, and sets to efficiently store and retrieve data. 8. Perform file handling operations, including reading from and writing to files. 9. Apply Python to practical tasks, such as web scraping, data manipulation, and analysis. 10. Demonstrate proficiency in working with files and directories, including navigating file systems and managing file permissions. 11. Develop graphical user interfaces (GUIs) using Python libraries to create interactive applications. 12. Prepare for exams by reviewing course materials, practicing exercises, and answering sample questions.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A: Introduction to Python and Basic Concepts (Estimated time: 10 hours)



	Overview of Python programming language Installation and setup Variables and data types Basic operators Input and output operations <u>Part B: Control Flow and Functions (Estimated time: 10 hours)</u> Conditional statements (if, else, elif) Loops and iterations (for loop, while loop) Functions and function arguments Recursion <u>Part C: Data Structures and File Handling (Estimated time: 10 hours)</u> Strings and string manipulation Lists and list manipulation Dictionaries and sets File handling and input/output operations <u>Part D: Advanced Topics (Estimated time: 15 hours)</u> Exception handling and error management Modules and packages Object-oriented programming (OOP) concepts Classes, objects, inheritance, and polymorphism <u>Part E: Applications and Practical Projects (Estimated time: 15 hours)</u> Working with files and directories GUI programming Web scraping Data manipulation and analysis
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Effective learning and teaching strategies involve creating an engaging and interactive learning environment. This can be achieved through a combination of various approaches, such as incorporating active learning techniques like group discussions, problem-solving activities, and hands-on experiments. Additionally, employing visual aids, multimedia resources, and real-world examples can enhance comprehension and retention. Encouraging student participation and providing timely feedback play vital roles in fostering student engagement and understanding. It is important to 

	promote a growth mindset, encourage critical thinking, and create opportunities for collaboration and peer learning. By employing these strategies, educators can facilitate meaningful learning experiences and empower students to become active participants in their own learning journey.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	21	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1
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 to 5], LO # [5 to 8]
	Assignments	4	10% (10)		
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # [1 to 12]
Summative assessment	Midterm Exam	2 hrs.	10% (10)	7	LO # [1 to 7]
	Final Exam	4hrs.	50% (50)	16	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Python, Variables, Data Types, and Basic Operators
Week 2	Control Flow and Conditional Statements
Week 3	Loops and Iterations
Week 4	Strings and String Manipulation
Week 5	Lists and List Manipulation
Week 6	Dictionaries and Sets
Week 7	Midterm Exam
Week 8	Functions and Function Arguments
Week 9	File Handling and Input/Output Operations
Week 10	Exception Handling and Error Management
Week 11	Modules and Packages
Week 12	Object-Oriented Programming (OOP) Concepts
Week 13	Classes and Objects
Week 14	Inheritance and Polymorphism
Week 15	Working with Files and Directories
Week 16	Preparatory Week for Final Exam



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to Python, Variables, and Basic Operators
Week 2	Control Flow and Conditional Statements
Week 3	Loops and Iterations
Week 4	Strings and String Manipulation
Week 5	Lists and List Manipulation
Week 6	Dictionaries and Sets
Week 7	Midterm Exam (No lab session).
Week 8	Functions and Function Arguments
Week 9	File Handling and Input/Output Operations
Week 10	Exception Handling and Error Management
Week 11	Modules and Packages
Week 12	Object-Oriented Programming (OOP) Concepts
Week 13	Classes and Objects
Week 14	Inheritance and Polymorphism
Week 15	Working with Files and Directories
Week 16	Final Exam (No lab session).

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Title: "Python Crash Course: A Hands-On, Project-Based Introduction to Programming" Author: Eric Matthes	
Recommended Texts	Title: "Learning Python" Author: Mark Lutz	No
Websites	URL: https://realpython.com	



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

أ.د. هارون عبد الكاظم شهد
الحيد

رئيس القسم : أ.د. محمود شاكر نصر

اسم التدريسي: م.م احسان ناجح شمرا

عميد الكلية : أ.د. هارون عبد الكاظم شهد

رئيس القسم : أ.د. محمود شاكر نصر

اسم التدريسي: م.م احسان ناجح شمرا

التاريخ : 2026 / 3 / 22

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Medical Communication systems	Module Delivery
Module Type	Core	☒ Theory ☐ Lecture
Module Code	MIET 3203	



ECTS Credits	5	☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	6
Administering Department	MIET	College	Faculty of Engineering techniques
Module Leader	Dr. Ahmed Mohammed Ojeimy	e-mail	ahmed.m.ojeimy@gmail.com
Module Leader's Acad. Title	Asst. Lecturer	Module Leader's Qualification	MSc
Module Tutor		e-mail	
Peer Reviewer Name	Dr. Ahmed Mohammed Ojeimy	e-mail	ahmed.m.ojeimy@gmail.com
Scientific Committee Approval Date	23/3/2026	Version Number	1

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Signals and systems	Semester	UGIII-S5
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	8. To learn the types of digital and analog modulation 9. To distinguish the difference between digital and analogue modulation 10. To learn the types of impulse modulation. 11. To learn spread spectrum systems 12. To learn the biomedical sensor network 13. To learn mobile communications (3G / 4G) 14. To learn telemedicine and healthcare systems 15. To learn the Internet of Things in medical applications
Module Learning Outcomes مخرجات التعلم للمادة	1. Understand and mitigate noise in communication systems. 2. Master the basics of sampling. 3. The student learns the types of digital and analog modulation. 4. The student distinguishes the difference between digital and analog modulation.



الدراسية	5. The student learns the types of impulse modulation. 6. The student learns spread spectrum systems 7. The student learns the biomedical sensor networks. 8. Learn wireless sensor networks. 9. The student learns mobile communications (3G / 4G) 10. The student learns telemedicine and healthcare systems 11. The student learns the Internet of Things in medical applications
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: 1. Communication System and types [4 H]. 2. AM and Fm modulation system and types and examples [4 H]. 3. Sampling, PAM, PWM, PPM, and PCM and examples [10 H]. 4. Digital Modulation Techniques, ASK, FSK, and PSK examples [8 H]. 5. Spread Spectrum Systems, Wireless Sensor Network, Biomedical Sensor Network, and Mobile Communication (3G/4G) and examples [20 H]. 6. Telemedicine and Health care Systems, IoT in Medical Applications and examples [8 H].

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lectures - means of clarification - intellectual questions - scientific exhibitions - scientific competitions

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		



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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Noise in Communication Systems
Week 2-3	Sampling, PAM, PWM, PPM, and PCM
Week 4-5	Digital Modulation Techniques
Week 6	Spread Spectrum Systems
Week 7	Mid-Exam
Week 8	Wireless Sensor Network
Week 9-10	Biomedical Sensor Network
Week 11-12	Mobile Communication (3G/4G)
Week 13	Telemedicine and Health care Systems
Week 14	IoT in Medical Applications
Week 15	Preparing for final exam



Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1-2	Amplitude Modulation large carrier and Amplitude Modulation suppressed carrier
Week 3	Frequency Modulation
Week 4	Amplitude Demodulation
Week 5	PAM
Week 6	PWM
Week 7	PPM
Week 8	ASK
Week 9	FSK
Week 10	PWM
Week 11	BPSK
Week 12	Biomedical Sensor Network
Week 13	Telemedicine and Health care Systems
Week 14	IoT in Medical Applications

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Introduction to Communication Systems	NO
Recommended Texts	Introduction to Communication Systems (second edition- by Ferrel. G. Stremler)	YES
Websites	7. https://www.coursera.org/search?query=Electromagnetic%20Fields&=null&index=prod_all_launched_products_optimization .	



	8. www.tallguide.com 9. www.ainfoinc.com 10. www.millitech.com 11. www.rfcafe.com 12. www.globalspec.com
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Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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Fail Group (0 - 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
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أ.د. محمود شاكر نصر
رئيس القسم

أ.د. محمود شاكر نصر

أ.م.د. احمد محمد الشمري
اسم التدريسي

أ.م.د. احمد محمد الشمري
شاهد

التاريخ : 2026 / 3 / 23

التاريخ : 2026 / 3 / 23

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية	
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Module Title	Medical Diagnostic Instrumentation II			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar	
Module Code	MIET3201				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		UG-III	Semester of Delivery		6
Administering Department		MIET	College	EETC	
Module Leader	Hayder Fadhil Jawad		e-mail	haydershubber@gmail.com	
Module Leader’s Acad. Title		Assistant Lecturer	Module Leader’s Qualification		M.Sc.
Module Tutor	Hayder Fadhil Jawad		e-mail	haydershubber@gmail.com	
Peer Reviewer Name	Hayder Fadhil Jawad		e-mail	haydershubber@gmail.com	
Scientific Committee Approval Date	24/3/2026		Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Medical Diagnostic Instrumentation I	Semester	UG-III - S5
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 module aims: 1. To provide a grounding in the theory of relevant biomedical measurement systems including sensors, signal acquisition and conditioning principles, measurement techniques and instrumentation and detectors; 2. To impart the basic theory and physiological interactions of imaging modalities (including microscopy, endoscopy, x-ray, ultrasound, CT, MRI, PET and IR) and review applications and image-guided

	interventions; 3. To teach the basic physiological and anatomical principles of surgical interventions, interventional radiology and how the imaging objectives relate to disease and treatment 4. To review the working principles of existing surgical technology including robotics and how this addresses the surgical intent, including current minimal access techniques and understand the implications for image guidance. 5. To provide a basic understanding of the process of invention and its management; an introduction to entrepreneurship and its interface with invention; product development and its relationship to invention, resultant intellectual property and entrepreneurship
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, students should be able to: 1. Understand the principles of operation of relevant sensors and detectors used in biomedical measurement for imaging and their technical specifications. 2. Be able to apply a range of signal analysis and signal processing methods. 3. Understand how medical imaging systems work, how they interact with the tissue, how their images can be interpreted and the limitations of their application. 4. Be familiar with a range of medical imaging applications for different pathologies, including cellular, molecular imaging and interventions. 5. Know how image guidance interacts and operates with instruments and equipment in surgical intervention including robotics. Understand the equipment and instruments required and how it is use. 6. Understand the requirements in quality spatial, contrast and time resolution of imaging modalities used for different outcomes. 7. have knowledge of the research and engineering methods applied in the development of medical imaging. 8. Basic knowledge and understanding of the inventive process and its management, the entrepreneurial basis of business development; exploitation and value of Intellectual Property. 9. This gives you a solid understanding of how engineering improves patient care. 10. Having the opportunity to gain valuable experience within a clinical environment – learning about the anatomy and functions of the human biology. 11. Develop research and business management skills within the biomedical industry. 12. the application of engineering principles and design concepts in biology and medicine, to solve challenges in the healthcare industry. 

	13. Gain an all-rounded understanding of where and how the technologies you develop will be used.
Indicative Contents المحتويات الإرشادية	The indicative contents of module include: <u>Part A:</u> • Physiologic quantities, basic concepts and principles of medical imaging instrumentation. • Signal types, measurement and sensor system properties, transfer functions, Fourier analysis, spectral analysis and filtering theory. [8 hrs.] <u>Part B:</u> • Characteristics of detection systems, amplification, noise/noise reduction and biomedical sensor and detector types. • Measurement constraints in the physical environment. [8 hrs.] <u>Part C:</u> • Principles and exemplar applications of x-ray and CT imaging. • Principles and exemplar applications of Nuclear and PET imaging. • Principles of MRI imaging, MRI applications and MRI-guided interventions, MRI safety. • Current and future developments of medical optical and photonics imaging, fluorescence, confocal, single/multiphoton, Raman, NIR. [8 hrs.] <u>Part D:</u> • Overview of diagnostic and interventional ultrasound and review of likely future developments. • Introduction to the objectives and practice of clinical diagnostic imaging. [12 hrs.] <u>Part E:</u> • Introduction to interventional principles, overview of instrumentation and devices, open, minimally invasive and image guided surgery. [12 hrs.]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The learning and teaching strategies employed in this module depending on the specific course. However, here are some common strategies 

	that may be used with this course: <u>Teaching methods include:</u> • lectures • seminars • tutorials • lab experiments • design assignments • industrial visits • professional training • a variety of projects <u>Assessment :</u> methods of assessment include a combination of: • coursework • group project reports • lab reports • written exams.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		



Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	15	10% (10)	Continuous	
	Report	15	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4 hr	50 % (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Modern Imaging Systems.
Week 2	X-ray Machines and Digital Radiography.
Week 3	X-ray Machines and Digital Radiography.
Week 4	X-ray Computed Tomography.
Week 5	X-ray Computed Tomography, Electrical Impedance Tomography.
Week 6	Magnetic Resonance Imaging System.
Week 7	Mid-Exam +
Week 8	Nuclear Medical Imaging Systems, Single- Photon – Emission Computed Tomography (SPECT).
Week 9	Nuclear Medical Imaging Systems, Gamma Camera, Positron Emission Tomography (PET) Scanner.
	Ultrasonic Imaging Systems, Three – Dimensional Ultrasound Imaging Systems, Portable Ultrasound Systems.
Week 10	Modern Ultrasound Imaging Systems.
Week 11	Thermal Imaging Systems.
Week 12	Magnetic Resonance Microscopy, Medical Applications of Virtual Reality Technology.
Week 13	Biomedical Telemetry.
Week 14	Telemedicine Technology.
Week 15	Recap and Final Assessments: Review of the Entire Syllabus, Preparing for final exam



Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	X-ray Machines and Digital Radiography.
Week2	X-ray Machines and Digital Radiography.
Week 2	X-ray Computed Tomography.
Week 3	X-ray Computed Tomography.
Week 4	Magnetic Resonance Imaging System.
Week 5	Magnetic Resonance Imaging System.
Week 6	Nuclear Medical Imaging Systems.
Week 7	Nuclear Medical Imaging Systems.
Week 8	Ultrasonic Imaging Systems.
Week 9	Ultrasonic Imaging Systems.
Week 10	Modern Ultrasound Imaging Systems.
Week 11	Thermal Imaging Systems.
Week 12	Biomedical Telemetry.
Week 13	Telemedicine Technology.
Week 14	Medical Applications of Virtual Reality Technology.
Week 15	Preparatory Week Before the Final Exam.,

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Khandpur , R. S. (1990) . Handbook of Biomedical Instrumentation , Tata McGraw Hill Publishing Co. 2. Joseph D. Bronzino (2006). The Biomedical Engineering Handbook, 3rd. Edition. Germany: Taylor & Francis.	Yes
Recommended Texts	1. Press.Joseph D. Bronzino (2006). Medical Devices and Human Engineering. (2017). United Kingdom: CRC Press.	 NO

	2. Khandpur, R. S. (2004). Biomedical Instrumentation: Technology and Applications. India: McGraw Hill LLC. 3. Brown, J. M., Carr, J. J. (2001). Introduction to Biomedical Equipment Technology. India: Prentice Hall.	
Websites	https://www.intuitive.com/en-us/products-and-services/da-vinci/learning .	

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

أ.د. هارون عبد الكاظم محمد
العصيد

رئيس القسم: أ.د. محمود شاكر نصر

اسم التدريسي: م.م. حيدر فاضل جواد

عميد الكلية: أ.د. هارون عبد الكاظم محمد

رئيس القسم: أ.د. محمود شاكر نصر

اسم التدريسي: م.م. حيدر فاضل جواد

التاريخ: 2026 / 3 / 24

التاريخ: 2026 / 3 / 24

التاريخ: 2026 / 3 / 24

وصف المقرر المادة

Module Information معلومات المادة الدراسية		
Module Title	Medical Electronic Systems	Module Delivery
Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical
Module Code	MIET3202	
ECTS Credits	6	
SWL (hr/sem)	150	



		☐ Seminar	
Module Level		Semester of Delivery	6
Administering Department		College	College of engineering
Module Leader	Medical Electronic Systems	e-mail	ruqia_alaa_ibrahim@hilla-unc.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	15/3/2026	Version Number	

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



Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Introduce the student to electronic circuits, their work and uses in the field of medical devices and the mechanism of building different medical systems. Learn about the applications of electronic circuits in the field of medical devices. Informing and training students on the latest developments in the field of medical electronics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Cognitive goals A1. Electronic circuit analysis A2. Design simple and complex electronic circuits A3. The ability to give appropriate solutions to the resulting malfunctions in electronic circuits and medical devices B - the skill objectives of the course B1 - Familiarize yourself with the electrical sign drawings. B2 - Designing digital medical electronic . electrical sign drawings systems with high efficiency and economic cost B3 - Providing scientific and practical advice in the field of maintaining medical electronic circuits.
Indicative Contents المحتويات الإرشادية	C- Emotional and value goals C1- The student listens carefully to the teacher's explanation C2 - That the student be acquainted with the impact of electronic systems in the field of medical devices C3- Introducing the student to the components .of electronic circuits C4 - Developing curricula and laboratories in line with the labor market.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Daily exams, quarterly exams - laboratory reports, annual exams, scientific activities		
Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	15 0		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Regulated power supplied .
Week 2	Monolithic regulators
Week 3	Additional switching regulator to pologies
Week 4	Active filters
Week 5	Butter worth filter practical realization
Week 6	Band pass filter, band reject filter
Week 7	
Week 8	.Mid-term exam
Week 9	Active resonant and band pass filter
Week 10-13	Active RC band pass filter
-Week 14	Digital to analogue converters (DAC)



Delivery Plan (Weekly Lab. Syllabus) المنهاج الأسبوعي للمختبر	
Week 1	.Regulated power supplied
Week 2	Monolithic regulators
Week 3	Additional switching regulator to pologies
Weeks 4-5	Active filters
Weeks 6-7	Butter worth filter practical realization
Weeks 8-9	Band pass filter, band reject filter
Week 10	.Mid-term exam
Week 11	Active resonant and band pass filter
Week 12	Active RC band pass filter
Weeks 13-14	Digital to analogue converters (DAC)
Learning and Teaching Resources مصادر التعلم والتدريس	

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

أ.د. هادي عبد الحاميد
الحاميد

عميد ال

التاريخ : 2026 / 3 / 15

رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15

اسم التدريسي: م.م. رقية علاء ابراهيم

التاريخ : 2026 / 3 / 15



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Power Electronics		Module Delivery
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MIET3204		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	6
Administering Department	MIET	College	EECT
Module Leader	Prof Dr. Mahmoud Shaker Nar	e-mail	Eng.mahmoud.shaker@uobabylon.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Prof Dr. Mahmoud Shaker Nar	e-mail	Eng.mahmoud.shaker@uobabylon.edu.iq
Peer Reviewer Name	Prof Dr. Mahmoud Shaker Nar	e-mail	Eng.mahmoud.shaker@uobabylon.edu.iq
Scientific Committee Approval Date	10/3/2026	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Electronic circuits II	Semester	UGII-S4
Co-requisites module	None	Semester	



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	12. To develop problem solving skills and understanding of power electronic theory through the application of techniques. 13. To understand thyristor ,transistor as switching from a given circuit. 14. This course deals with the basic concept of rectifier . 15. This is the basic subject chopper. 16. To understand ac-ac converter, inverter. 17. Application of power electronics especially in medical instrument.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	12. Recognize how power electronic works in electrical circuits. 13. List the various terms associated with power electronic. 14. Summarize what is meant by a basic with power electronic. 15. Discuss the reaction and involvement in rectifier circuit. 16. Describe thyristor ,transistor diode . 17. dc- dc converter. 18. Identify the basic circuit elements and their applications. 19. Discuss the operations of dc-dc converter. 20. Discuss the various properties inverter (dc/ac) 21. Explain the applications of power electronics in industry especially in medical equipment .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</u> [Diode and Transistor Thyristor as switch its characteristic ,protection, triggering circuit. [15 hrs.] AC circuits I –Single phase half wave and full wave Rectifier . [10 hrs] Revision problem classes [5 hrs] <u>Part B Applications</u> dc-dc converter ,stepdown and step up chopper. [15 hrs] Single phase and three phase inverters. [15 hrs] Applications of power Electronics UPS.SMPS and Health car application. [10 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 lectures, interactive tutorials and by considering type of simple experiment 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	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to power electronics., Switching devices, power & control device
Week 2	Types and characteristic, rating (diode, transistor ...).
Week 3	Methods of turning – on & turning – off.
Week 4	Uncontrolled Half Wave 1-phase Rectifier with R- Load and R-L load Uncontrolled Full Wave 1-phase Rectifier with R- Load and R-L load
Week 5	Uncontrolled Half Wave 3-phase Rectifier with R- Load and R-L load. Uncontrolled Full Wave 3-phase Rectifier with R- Load and R-L load
Week 6	Controlled Half Wave 1-phase Rectifier with R- Load and R-L load Controlled Full Wave 1-phase Rectifier with R- Load and R-L load
Week 7	Controlled Half Wave 3-phase Rectifier with R- Load and High inductive load Controlled Full Wave 3-phase Rectifier with R- Load and High inductive load
Week 8	Mid Term Exam
Week 9	Single Phase Half Bridge Inverter.
Week 10	Single Phase Full Bridge Inverter.
Week 11	Single-Phase Half Wave AC Voltage Controller.
Week 12	Single-Phase Full wave AC Voltage Controller.
Week 13	Step-Down DC Chopper.
Week 14	Step-Down DC Chopper.
Week 15	Application of power Electronics in medical instruments Preparatory week before the final Exam

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, 8 and 10
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	8	15% (10)	Continuous	
	Report	1	5% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Uncontrolled Resistive Half Wave Rectifier with Load.
Week 2	Controlled Half Wave Rectifier with Resistive Load.
Week 3	Controlled Half Wave Rectifier with Inductive Load.
Week 4	Single Phase Full Wave Rectifier (Bridge) /Part I.
Week 5	Single Phase Full Wave Rectifier (Bridge) /Part II.
Week 6	Three Phase Half Wave Rectifier.
Week 7	Three Phase Full Wave Rectifier.
Week 8	Single Phase Half Bridge Inverter/ Part 1.
Week 9	Single Phase Half Bridge Inverter/ Part 2.
Week 10	Single Phase Full Bridge Inverter.
Week 11	Single-Phase Half Wave AC Voltage Controller.
Week 12	Single-Phase Full wave AC Voltage Controller.
Week 13	Step-Down DC Chopper.
Week 14	Step-Down DC Chopper.



Week 15	Final exam.
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Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Power Electronics By Lander	Yes
Recommended Texts	Power Electronics Devices, Circuits, and Applications by Muhammad H.Rashid	No
Websites	https://elcom-team.com/Subjects/power	

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

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



أ.د. هارون عبد الكاظم محمد
الحمد

عميد الكلية : أ.د. هارون عبد الكاظم محمد

التاريخ : 2026 / 3 / 15

أ.د. محمود شاكر نصر

رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15

أ.د. محمود شاكر نصر

اسم التدريسي: أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15



Fourth stage

UGIV

Annual



Fourth Year – Annual

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Artificial Neural Engineering		Module Delivery	
Module Type	Elective		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET4107			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	UGIV	Semester of Delivery		7
Administering Department	MIET	College	Faculty of engineering techniques	
Module Leader	Dr. Haider Mahdi		e-mail	Eng.Hayder@gmail.com
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Haider Mahdi		e-mail	E-mail
Peer Reviewer Name	Dr. Haider Mahdi		e-mail	Eng.Hayder@gmail.com
Scientific Committee Approval Date	15/3/2026		Version Number	1.0

Relation with other Modules				
العلاقة مع المواد الدراسية الأخرى				
Prerequisite module	MIET1206, MIET3102		Semester	UG UG III – ٣٣



Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	18. Introduce the biological inspiration of artificial neural network. 19. List some of applications of artificial neural networks 20. Introduce the simplified mathematical model of the neuron. 21. Explain how these artificial neurons can be interconnected to form a variety of network architectures. 22. Show how the architectures of artificial neural networks can be used to solve a practical problems. 23. Show how to classify the learning rules as supervised, unsupervised and reinforcement learning rules. 24. Introduce some of learning rules for classification, regression, clustering and prediction problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. The student will be able to design an artificial neural networks for linear Regression by using backpropagation algorithm. 2. The student will be able to design an artificial neural network for pattern Classification problems. 3. The student will be able to design an artificial neural networks for clustering Problems using competitive learning rules. 4. The student will be able to design an artificial neural networks for prediction Problems using dynamic networks. 5. In general the student will be able to read the problem requirements and how to design the neural network for this problem. 6. Using genetic algorithm for solution optimization. 7. Design a control system using fuzzy logic. 8. apply the A.I in medical system 9. the concept of Biological inspiration 10. How simulate the human brain behavior. 11. Apply of fuzzy logic in diagnosis of medical. 12. Using Expert system in medical
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. - Introduction: History , Applications , Biological Inspiration (3hrs) - Neuron Model and Network Architecture: Single – Multiple Input Neuron, Transfer Functions, Single – Multiple Layers of Neurons, Recurrent Networks (2hrs). - Pattern Recognition Example: Perceptron, Hamming and Hopfield network (3hrs). - Perceptron network: Perceptron Architecture, Perceptron Learning Rule (2hrs). - Signal and Weight Vector Spaces: linear vector space, inner orthogonality , Norm , Gram-Schmidt Orthogonalization (3hrs). - Linear Transformations for Neural Networks: Linear Transformati



	Representations, Change of Basis, Eigenvalues and Eigenvectors, Diagonalization (3hrs). - Supervised Hebbian Learning: Linear Associator, The Hebb Rule, Pseudoinverse Rule, Application (2hrs). - Performance Surfaces and Optimum Points: Taylor Series, Directional Derivatives, Minima, Necessary Conditions for Optimality, Quadratic Functions (3hrs). - Performance Optimization: Steepest Descent, Newton's Method, Conjugate Gradient (2hrs). - Widrow-Hoff Learning: ADALINE Network, Mean Square Error, LMS Algorithm, Analysis of Convergence, Adaptive Filtering (2hrs). - Backpropagation: Multilayer Perceptrons, The Backpropagation Algorithm, Batch vs. Incremental Training (3hrs). - Variations on Backpropagation: Heuristic Modifications of Backpropagation, Numerical Optimization Techniques (2hrs). - Generalization: Early Stopping, Regularization, Bayesian Regularization (3hrs). - Dynamic Networks: Real Time Recurrent Learning, Backpropagation-Through-Time (3hrs). - Associative Learning: Unsupervised Hebb Rule, Instar Rule, Outstar Rule (2hrs). - Competitive Networks: Self-Organizing Feature Maps, Learning Vector Quantization (3hrs). - Radial Basis Networks: Radial Basis Network, Training RBF Networks, Linear Least Squares, Orthogonal Least Squares (2hrs). - Genetic Algorithm : Mathematical equation solving using genetic algorithm , Neural network learning using genetic algorithm (3hrs). - Fuzzy Logic : examples of control system design based fuzzy logic algorithm (3hrs).
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, report presentation, Practical testing

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4



الحمل الدراسي المنتظم للطلاب خلال الفصل			
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (20)	3,6,9,12	All
	Assignments	2	5% (5)	6,12	All
	Projects / Lab.	7	15% (10)	Continuous	All
	Report	1	5% (5)	14	All
Summative assessment	Midterm Exam	2 hr	10% (10)	8	All
	Final Exam	4 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	- Introduction to the artificial intelligence - Machine learning
Week 2	- Perceptron learning rule
Week 3	- Supervised Hebb learning rule
Week 4	- Widrow – Hoff learning rule - Adaptive noise cancellation design using neural network
Week 5	- Multi- layer perceptron - Backpropagation learning rule
Week 6	- Variations of Backpropagation Algorithm
Week 7	- Mid Term
Week 8	Associative learning/ Kohonen self-organization
Week 9	- Competitive networks + Deep learning (Deep Recurrent Neural Network & convolution Neural Network)



Week 10	- Expert system
Week 11	- Hopfield networks
Week 12	- Introduction to the Genetic algorithm
Week 13	- Fuzzy logic
Week 14	- <i>Machine Learning Classification/ Machine Learning Linear Regression</i>
Week 15	- Applications of A.I in medical Engineering - Preparing for the final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	- Review of MATLAB programing.
Week 2	- Perceptron learning rule MATLAB programming .
Week 3	- Supervised Hebb learning rule MATLAB programming.
Week 4	- Widrow – Hoff learning rule MATLAB programming. - Adaptive noise cancellation design using neural network with MATLAB programming.
Week 5	- Incremental Backpropagation learning rule MATLAB programming. - Batch Backpropagation learning rule MATLAB programming.
Week 6	- Levenberge – Marquardt algorithm MATLAB programming.
Week 7	- Golden Section Search algorithm MATLAB programming.
Week 8	- Instar , Outstar , Hebbian Supervised learning rules MATLAB programming.
Week 9	- Learning Vector Quantization learning rule MATLAB programming.
Week 10	- Linear Least Square Error learning rule MATLAB programming.
Week 11	- MATLAB program for mathematical equation solution optimization using genetic algorithm
Week 12	- Fuzzy logic implementation using MATLAB program
Week 13	- Introduction to the KNIME program



Week 14	- Machine Learning classification using KNIME program
Week 15	- Machine Learning Linear Regression using KNIME program

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Neural Network Design By HAGAN	Yes
Recommended Texts	Fundamental of Neural Network By Luerene	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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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.				



عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 15



رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15

أ.د. حيدر مهدي

2026 / 3 / 1



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Biomedical Signal Processing		Module Delivery
Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET4104		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG IV		Semester of Delivery
Administering Department	MIET	College	Faculty of Engineering Techniques
Module Leader	Dr. Prof Hussain F. Hamdan	e-mail	Hussain1956@gmail.com
Module Leader's Acad. Title	professor	Module Leader's Qualification	Ph.D.
Module Tutor	Dr. Prof Hussain F. Hamdan	e-mail	Hussain1956@gmail.com
Peer Reviewer Name	Dr. Prof Hussain F. Hamdan	e-mail	Hussain1956@gmail.com
Scientific Committee Approval Date	15/3/2026	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Signals and systems _ MIET3104	Semester	UG III-S5
Co-requisites module	None	Semester	



Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	✓ Provide knowledge on the characteristics of medical data and the analysis of physiological signals. ✓ Equips learners with skills for efficient data management and signal analysis, contributing to improved healthcare delivery and patient outcomes. ✓ Understanding random physiological signals and their analysis as stochastic processes. ✓ Focuses on applying averaging techniques, utilizing the sampling theorem, implementing windowing, efficient computation of discrete Fourier transform, and implementing discrete-time systems. ✓ Understanding and implementing digital filters that involve FIR and IIR filters, analyzing filter characteristics, designing filters, and applying filters for signal processing and noise reduction.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, students should be able to: ✓ Demonstrate a systematic knowledge of the complex physical and physiological principles that underpin biomedical signals. ✓ Demonstrate an understanding of the principles of digital signal processing. ✓ Systematically apply methods to extract relevant information from biomedical signal measurements. ✓ Critically assess the appropriateness of biomedical signal processing techniques for various challenges in the field. ✓ Model of random signals and interference noise. ✓ Design noise reduction techniques. ✓ Consider signal sampling and effect of aliasing. ✓ Evaluate the effectiveness of techniques applied to biomedical signals against specific benchmarks. ✓ Consider discrete system implementation techniques. ✓ Knowledge of digital filter (frequency selection system) design.
Indicative Contents المحتويات الإرشادية	✓ Characteristics of medical data, physiological signals analyzer, medical care system, nature of biomedical signals, signal acquisition [7 hrs]. ✓ Random physiological signals, signal as stochastic process, averaging techniques [10 hrs]. ✓ Sampling theorem, windowing, Efficient computation of discrete Fourier transform [11 hrs]. ✓ Implementation of discrete time systems, digital filters (FIR, IIR) [17 hrs].

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The primary method for delivering this module will be to encourage students to participate in the tasks while improving and expanding their critical thinking skills. This will be accomplished through class lectures and seminars and the consideration of basic experiments incorporating various sample activities that are attractive to the students and improve module kr
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Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	74	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
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	15%(15)	5 and 10	LO #4 and #9
	Assignments	2	10%(10)	2 and 12	LO #5 and #10
	Projects / Lab.	4	10%(10)	Continuous	All
	Report	1	5%(5)	13	LO #8
Summative assessment	Midterm Exam	2hr	10%(10)	7	LO #1 - #6
	Final Exam	4hr	50%(50)	16	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	✓ CHARACTERISTICS OF MEDICAL DATA ✓ PHYSIOLOGICAL SIGNALS ANALYZER ✓ MEDICAL CARE SYSTEM
Week 2	✓ NATURE OF BIOMEDICAL SIGNALS ✓ SIGNAL ACQUISITION
Week 3	<u>RANDOM PHYSIOLOGICAL SIGNALS</u>



Week 4	✓ SIGNAL AS STOCHASTIC PROCESS ✓ AVERAGING TECHNIQUES
Week 5	
Week 6	SAMPLING THEOREM
Week 7	Mid Term
Week 8	WINDOWING
Week 9	EFFICIENT COMPUTATION OF DISCRETE FOURIER TRANSFORM
Week 10	
Week 11	IMPLEMENTATION OF DISCRETE TIME SYSTEMS
Week 12	
Week 13	<u>DIGITAL FILTERS</u> ✓ FIR ✓ IIR
Week 14	
Week 15	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	SIGNAL ACQUISITION
Week 2	
Week 3	AVERAGING TECHNIQUES
Week 4	
Week 5	SAMPLING
Week 6	
Week 7	WINDOWING
Week 8	
Week 9	EFFICIENT COMPUTATION OF DISCRETE FOURIER TRANSFORM
Week 10	
Week 11	IMPLEMENTATION OF DISCRETE TIME SYSTEMS
Week 12	
Week 13	DIGITAL FILTERS
Week 14	



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	John G. Proakis & Dimitris G. Manolakis, Digital Signal Processing, Principles, Algorithms and Applications, 2007, 4 th Edition, Pearson Prentice Hall.	621.382 1920
Recommended Texts	Eugene N. Bruce, Biomedical Signal Processing and Signal Modeling, 2000, John Wiley & Sons. A V Oppenheim & R W Schafer, Discrete-time Digital Signal Processing, 2009, Edition: 3rd, Prentice-Hall: Englewood Cliffs, NJ	
Websites		

Grading Scheme

مخطط الدرجات

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

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



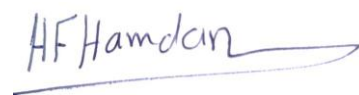
عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 15



رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 15



اسم التدريسي : أ.د. حسين فاضل حمدان

التاريخ : 2026 / 3 / 15

MODULE DESCRIPTION FORM



نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Control System		Module Delivery
Module Type	Core		☒ Theory x Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MIET4103		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG IV	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Thamer Mohammed Hunain	e-mail	Thamer_mohammed @hilla-unc.edu.iq
Module Leader's Acad. Title	Lecture Assistant	Module Leader's Qualification	master
Module Tutor	Thamer Mohammed Hunain	e-mail	E-mail
Peer Reviewer Name	Thamer Mohammed Hunain	e-mail	Thamer_mohammed @hilla-unc.edu.iq
Scientific Committee Approval Date	26/3/2026	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Engineering mathematics MIET2104	Semester	UGII-S3
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 module aims to: 1. calculate system sensitivity and disturbance rejection and the effect of feedback on these 2. analyses and design for steady-state error requirements 3. analyses system stability and performance using analytical techniques 4. analyses system stability and performance using graphical frequency response techniques 5. design, simulate and evaluate compensator-based control schemes 6. design, simulate and evaluate PID-based control schemes 7. use appropriate software tools to present, analyses, design and simulate systems 8. effectively present and discuss the analysis and/or design of systems by written means 9. enable students to comprehend the characteristics of digital controller and apply appropriate design methods.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After completing this lecture, the student will be able to: 1. Define a control system and describe some applications. 2. Describe historical developments leading to modern day control theory 3. Describe the basic features and configurations of control systems 4. Describe control systems analysis and design objectives 5. Describe a control system's design process 6. Describe the benefit from studying control systems 7. Be able to apply the Laplace transform and Z transform in the development of transfer functions for a range of simple dynamic systems. 8. Be able to analyses transfer functions and present the properties of the systems they represent in terms of control objectives. 9. Be able to design static and dynamic control systems to achieve a set of desired control objectives. 10. Know how to use software tools, based upon the MATLAB environment to support control system analysis and design. 11. Be able to design and implement active control components such as I 12. controllers to achieve desirable control objectives. 13. Understand how control engineering sits within robotics system design

	and implementation.
Indicative Contents المحتويات الإرشادية	The indicative contents of control system module include: 1. Introduction to linear control engineering. [15 hrs.] 2. Transfer function, block diagram representation and reduction, signal flow diagram, State space representation and analysis. [15 hrs.] 3. Mathematical background; laplace transform, complex variable, matrices. [10 hrs.] 4. Time domain analysis, steady – state transient analysis. Stability analysis; Routh, Nyquist. [9 hrs.] 5. Root locus technique. [10 hrs.] 6. Frequency domain analysis, gain margin, phase margin and bode plot. 7. Frequency domain synthesis, phase lead. [10 hrs.] 8. Compensation, phase – lag compensation lag – lead compensation - PID controllers design. [9 hrs.]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The learning and teaching strategies employed in a Control system engineering module can vary depending on the specific course or institution. However, here are some common strategies that may be used: 1. Lectures: Theoretical ideas and the basics of control system knowledge are frequently presented in lectures. Using visual aids like slides, diagrams, and demonstrations, lecturers may go through important theories, concepts, and methods. 2. Practical Sessions: Practical sessions strengthen theoretical ideas while also provide practical experience. Implementing and analyzing signal processing methods can be done by students using software tools like MATLAB, Python, or specialist software. Students can apply their knowledge and work in groups or individually during practical sessions to address difficulties in real-world processing. 3. Laboratory Experiments: In a controlled setting, laboratory experiments give students the chance to apply CONTROL SYSTEM ENGINEERING ideas. To design and implement, they might use hardware like signal generators, oscilloscopes, and CONTROL SYSTEM ENGINEERING boards. 4. Problem-Solving activities: In class and as homework assignments, problem-solving activities let students use their understanding and analytical abilities to tackle CONTROL SYSTEM ENGINEERING issues. These exercises could entail creating mathematical models, interpreting signals, generating mathematical expressions, or plugging algorithms into practice. To assist students in developing problem-solving skills, instructors may offer comments in direction.

	5. Case Studies and Applications: CONTROL SYSTEM ENGINEERING case studies and real-world applications assist students in comprehending the relevance and application of the ideas they are taught. This method improves students' ability to use CONTROL SYSTEM ENGINEERING principles in a variety of contexts. 6. Group talks and Peer Learning: Group talks and cooperative exercises encourage peer-to-peer engagement and active learning. Together, students may solve issues, discuss ideas, and exchange ideas. This strategy promotes critical thinking, understanding through many views, and teamwork abilities. Online Resources, In addition to traditional teaching methods, instructors may utilize online resources, multimedia content, and interactive tools to supplement learning. These resources can include video tutorials, simulations, online quizzes, and discussion forums. They provide flexibility, enable self-paced learning, and facilitate deeper exploration of CONTROL SYSTEM ENGINEERING concepts. 7. Assessments: Students' comprehension and application of CONTROL SYSTEM ENGINEERING principles are assessed by assessments such as quizzes, examinations, projects, and presentations. Theoretical inquiries, problem-solving exercises, and practical demonstrations could all be a part of these evaluations. They aid in measuring learning outcomes and give students feedback on their development.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية



		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 8 and 9
	Assignments	2	10% (10)	7, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	8	15% (10)	Continuous	All
	Report	1	5% (10)	14	LO # 1-14
Summative assessment	Midterm Exam	2 hours	10% (10)	7	LO # 1-7
	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	- Introduction to CONTROL SYSTEM ENGINEERING: Overview, applications, and advantages of control system. - Test signal : Introduction to continuous-time, unit-step, ramp and system representations.
Week 2	Mathematical background; modelling , application of mathematical modelling.
Week 3	Laplace transformation and inverse Laplace transform, partial fraction
Week 4	Block diagram representation for 1st and 2nd type
Week 5	Block diagram representation reduction, rules of minimizing block diagram.
Week 6	signal flow diagram.
Week 7	Mid-term exam
Week 8	Time domain analysis, for 1st , 2nd and higher order system
Week 9	- Stability analysis; Routh, Nyquist - Root locus technique
Week 10	Root locus technique design
Week 11	Frequency domain analysis, Gain margin, phase margin and bode plot.
Week 12	Frequency domain synthesis, phase lead
Week 13	Compensation, phase – lag compensation lag – lead compensation.
Week 14	PID controllers design.
Week 15	Preparatory week before the final Exam

Delivery Plan (Weekly Workshop Syllabus)

المنهاج الاسبوعي للورشة

	Material Covered
Week 1	Lab Safety & Lab Equipment Use Tutorial.
Week 2	Introduction to Computer Simulation
Week 3	Transfer Function Simplification and Solution
Week 4	State Space Method
Week 5	Zeros, Poles and Stability
Week 6	Time Response characteristics for 1 st , 2 nd order system
Week 7	Root-Locus drawing
Week 8	Root-Locus design controller
Week 9	Frequency response characteristics
Week 10	Bode and Nyquist diagram
Week 11	Check the stability by PM and GM
Week 12	PID Controller
Week 13	QNET DC Motor Position Control
Week 14	Lead-Lag Compensation
Week 15	Presentation & Demonstration of Final Project

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Modern Control Engineering, Ogata Katsuhiko, 5th Edition, Prentice-Hall, 2010.	Yes
Recommended Texts	Nise, N. S., 'Control Systems Engineering', 5th Edition, John Wiley, International Student Version. 2008. ISBN 978-0-470-16997-1	No
Websites	The Collage E-Library	

Grading Scheme



مخطط الدرجات

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

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


د. هارون عبد الكاظم
الحمد

عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 26



رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 26



اسم التدريسي: م.م ثامر محمد هنين

التاريخ : 2026 / 3 / 26

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية



Module Information				
معلومات المادة الدراسية				
Module Title	Medical Laser Systems		Module Delivery	
Module Type	Core		☒ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET4102			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UG IV	Semester of Delivery		
Administering Department	MIET	College	EETC	
Module Leader	MS.c. Sajdeen K. Dawood		e-mail	Sajdeen.k@s.uokerbala.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.	
Module Tutor	MS.c. Sajdeen K. Dawood		e-mail	Sajdeen.k@s.uokerbala.edu.iq
Peer Reviewer Name	MS.c. Sajdeen K. Dawood		e-mail	Sajdeen.k@s.uokerbala.edu.iq
Scientific Committee Approval Date	22/3/2026	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Anatomy and Physiology_ MIET2105	Semester	UGII- S3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Understand the nature of light and laser generation, including the in of the electromagnetic spectrum, absorption, and emission processe 2. Familiarize with laser levels systems and the properties of laser light. 3. Gain knowledge of laser system design, including the active medium, pumping



	sources, and optical resonators. 4. Comprehend medical laser delivery systems. 5. Identify different types of laser systems and their properties. 6. Learn about laser detectors, including quantum detectors, vacuum photodiodes, and photomultipliers. 7. Explore the interaction between laser radiation and biological tissue. 8. Understand the various mechanisms of laser-tissue interaction. 9. Categorize laser medical applications based on the type of laser, type of treatment, and the targeted organ. 10. Examine laser medical applications in surgery, dermatology, ophthalmology, dentistry, oncology, and urology. 11. Understand laser hazards and the classification of laser hazards based on intensity. 12. Learn about the standard levels for ensuring safe working environments in laser-related settings.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the principles of medical laser applications. 2. Explain absorption and emission processes in laser systems. 3. Grasp the energy levels in laser systems and their role in laser emission. 4. Describe the unique properties of laser light. 5. Gain knowledge of different types of medical lasers and their specific applications in various medical fields. 6. Identify the benefits and limitations of using lasers in medical procedures. 7. Develop an understanding of laser-tissue interaction and the mechanisms behind the therapeutic effects of laser treatments. 8. Acquire practical skills in the operation, calibration, and maintenance of medical laser equipment. 9. Apply critical thinking and problem-solving skills to assess patient suitability for laser treatments. 10. Familiarize with safety protocols and precautions associated with medical laser procedures.
Indicative Contents المحتويات الإرشادية	Light Nature and Laser Generation, Introduction of Electromagnetic Spectrum, Absorption and Emission, Laser Levels System, Properties of Laser Light. (7 hrs) Laser System Design (Active medium, Pumping Source as an Excitation Mechanism, Optical Resonator). (6 hrs) Medical Laser Delivery System; Understanding Structure of an Optical Fiber, Types of Optical Fiber, Photonic Crystal Fiber and transmission Characteristics of Fiber Cable and 7-Articular arms. (12 hrs) Laser System Types and Properties (1. Solid state laser (Ex: Ruby Laser, Nd:YAG and Nd:YLF), 2. Gas Laser(Ex: He-Ne, CO₂, N₂ and Argon Ion Laser). (3. Semiconductor Laser, 4. Dye laser (Ex: Tunable Dye and Flowing Dye)). (8 hrs) Laser Detectors (Quantum Detector, Vacuum Photodiode, and photomu hrs) Interaction Between Laser Radiation and Biological Tissue (Intensity of radiation,

	Shape of Irradiation, Spatial Nature of Laser Beam). Laser Effect In Biological Tissue (Mechanisms of Laser- tissue interaction, Photochemical Interaction, Photomechanical interaction, Photothermal Interaction, Photoablation Interaction, Plasma-Induced Photoablation and Photodisruption). (6 hrs) Laser Medical Application Categorization According to (Type of Laser, Type of Treatment, Organ) (3 hrs) Laser Medical Application in(Surgery, Dermatology, Ophthalmology, Dentistry, Oncology, Urology) (9 hrs) Laser Hazards; Understanding the Classification of laser hazard According to the Intensity. The Standard level for Safe Working Environments. (8 hrs)
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Lecture-based Instruction, Hands-on Laboratory Sessions, Guest Speakers and Industry Experts, Field Visits and Clinical Observations, Collaborative Learning, Assessment Methods, Continuous Learning and Professional Development
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	46	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative	Quizzes	2	10% (10)	5,9	LO #4,#5,#6,٤



assessment	Assignments	2	5% (5)	4,10	LO #3 and #10
	Project / Lab.	5	20% (20)	Continuous	All
	Report	1	5% (5)	12	LO #4, #5 and #10, #11
Summative assessment	Midterm Exam	2hr	10% (10)	13	LO #1.....#7
	Final Exam	3hr	50% (50)		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Light Nature and Laser Generation, Introduction of Electromagnetic Spectrum, Absorption and Emission, Laser Levels System, Properties of Laser Light.
Week 2	Laser System Design (Active medium, Pumping Source as an Excitation Mechanism, Optical Resonator).
Week 3	Medical Laser Delivery System; Understanding Structure of an Optical Fiber, Types of Optical Fiber, Photonic Crystal Fiber and transmission Characteristics of Fiber Cable and 7-Articular arms.
Week 4	Laser System Types and Properties (1. Solid state laser (Ex: Ruby Laser, Nd:YAG, Nd:YLF and Er:YAG), 2. Gas Laser (Ex: He-Ne, CO ₂ , N ₂ and Argon Ion Laser).
Week 5	Laser System Types and Properties (3. Semiconductor Laser, 4. Dye laser (Ex: Tunable Dye and Flowing Dye)).
Week 6	Laser Detectors (Quantum Detector, Vacuum Photodiode, and photomultiplier)
Week 7	Mid Term Exam
Week 8	Interaction Between Laser Radiation and Biological Tissue (Intensity of Radiation, Shape of Irradiation, Spatial Nature of Laser Beam). Laser Effect In Biological Tissue (Mechanisms of Laser- tissue interaction, Photochemical Interaction, Photomechanical interaction, Photothermal Interaction, Photoablation Interaction, Plasma-Induced Photoablation and Photodisruption).
Week 9	Laser Medical Application Categorization According to (Type of Laser, Type of Treatment, Organ)
Week 10	Laser Medical Application in Surgery and Laser Medical Application in Dermatology
Week 11	Laser Medical Application in Ophthalmology



Week 12	Laser Medical Application in Dentistry
Week 13	Laser Medical Application in Oncology
Week 14	Laser Medical Application in Urology
Week 15	Laser Hazards; Understanding the Classification of laser hazard According to the Intensity.

Delivery Plan (Weekly Lab. Syllabus) المناهج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab safety - Tools
Week 2	Reflection, Refraction and Total Internal Reflection
Week 3	Divergence
Week 4	Semiconductor Manufacturing
Week 5	Emission Circuit Design
Week 6	Detection Circuit Design
Week 7	Optical Fiber Types, Color Scheme and Intro to Connectors
Week 8	Optical Fiber Characterization
Week 9	Optical Fiber Characterization
Week 10	Splicing (Mechanical)
Week 11	Splicing (Automated)
Week 12	Optical fiber losses
Week 13	Preparing for the Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Libra
Required Texts	An introduction to the Laser theory and applications By M. N. Avadhanulu and Dr. P. S. Hemne.	No Yes 

	Optical Fiber Communications By Gerd Keiser,second edition. Laser Principles and Applications By J.Wilson.	No
Recommended Texts	Photonics Linear and non Linear Interactions of Laser and Matter	No
Websites		

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

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

أ.د. هارون عبد الكاظم
عميد

أ.د. محمود شاكر نصر
رئيس القسم

أ.م. ساجدين كاظم داود
اسم التدريسي

أ.د. هارون عبد الكاظم شهد

أ.د. محمود شاكر نصر

أ.م. ساجدين كاظم داود

التاريخ: 2026 / 3 / 22

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التاريخ: 2026 / 3 / 22

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية



Module Information					
معلومات المادة الدراسية					
Module Title	Medical Therapeutic Instrumentation I		Module Delivery		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar		
Module Code	MIET4101				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		UGIV			Semester of Delivery
Administering Department		MIET	College	Faculty of Engineering Techniques	
Module Leader	Ali Tawfeek		e-mail	Ali_Tawfeek@gmail.com	
Module Leader's Acad. Title		Assistant Lecturer	Module Leader's Qualification		M.Sc.
Module Tutor					
Peer Reviewer Name		Ali Tawfeek	e-mail	Ali_Tawfeek@gmail.com	
Scientific Committee Approval Date		22/3/2025	Version Number		1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Anatomy & Physiology _ MIET2105	Semester	UGII -S3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. The graduated students will acquire the theoretical concepts behind medical therapeutic instruments. 2. The graduates get the scientific and applied skills to diagnosis th therapeutic instruments faults. 3. The graduated students will gain the necessary knowledge about different parts 

	of medical therapeutic instruments. 4. Development and training the engineering technical staff on the medical therapeutic instruments maintenance. 5. Preparation of the research and studies to improve and develop the medical therapeutic instruments 6. Put the proposals and alternatives for the medical therapeutic instruments.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the importance of surgeries in human medical therapy. 2. Get the basic knowledge about the medical instruments used in operating room. 3. Understand the concept behind the surgical diathermy. 4. Identify the parts of the surgical diathermy instrument and recognize its faults and the methods of maintenance. 5. Understand the working principle of Dental chair. 6. Identify the parts of the Dental chair and recognize its faults and the methods of maintenance. 7. Understand the concept behind the ophthalmic microsurgical instruments. 8. Identify the parts of the ophthalmic microsurgical instrument and recognize its faults and the methods of maintenance. 9. Understand the working principle of heart-lung machine. 10. Identify the parts of the heart-lung machine and recognize its faults and the methods of maintenance. 11. Understand the concept behind the Hemodialysis machine. 12. Identify the parts of the hemodialysis machine and recognize its faults and the methods of maintenance. 13. Understand the working principle of Therapeutic diathermy instruments. 14. Identify the parts of the therapeutic diathermy instruments and recognize its faults and the methods of maintenance.
Indicative Contents المحتويات الإرشادية	General systems and specialized tools in general surgery [9 hrs]. Surgical diathermy, cautery [8 hrs]. Dental chair [10 hrs]. Ophthalmic microsurgical Inst. [9 hrs]. Heart – lung machine [10 hrs]. Hemodialysis machine [9 hrs]. Therapeutic Diathermy [12 hrs].
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. Moreover, mc creative side by posing various problems to students and urging the appropriate solutions. 

	Also forming work teams to assess the results of their work and change their structure periodically to develop the spirit of cooperation and development and motivate students to make intensive efforts to work different roles.
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Student Workload (SWL)			
الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15% (15)	5, 10	LO #1, 2, 3, 4,8,9 and 10
	Assignments	1	5% (5)	8	LO #5, 8
	Projects / Lab.	8	15% (15)	Continuous	All
	Report	1	5% (5)	13	LO # 3,5, 7,9 and 11
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO # 1-6
	Final Exam	4 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الأسبوعي النظري	
	Material Covered
Week 1	General systems and specialized tools in general surgery I
Week 2	General systems and specialized tools in general surgery II
Week 3	Surgical diathermy, cautery I
Week 4	Surgical diathermy, cautery II



Week 5	Dental chair I
Week 6	Dental chair II
Week 7	Mid-Term Exam
Week 8	Ophthalmic microsurgical Inst. I
Week 9	Ophthalmic microsurgical Inst. II
Week 10	Heart – lung machine I
Week 11	Heart – lung machine II
Week 12	Hemodialysis machine I
Week 13	Hemodialysis machine II
Week 14	Therapeutic Diathermy I
Week 15	Therapeutic Diathermy II Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	General systems and specialized tools in general surgery I
Week 2	General systems and specialized tools in general surgery II
Week 3	Surgical diathermy, cautery I
Week 4	Surgical diathermy, cautery II
Week 5	Dental chair I
Week 6	Dental chair II
Week 7	Ophthalmic microsurgical Inst. I
Week 8	Ophthalmic microsurgical Inst. II
Week 9	Heart – lung machine I
Week 10	Heart – lung machine II
Week 11	Hemodialysis machine I
Week 12	Hemodialysis machine II
Week 13	Therapeutic Diathermy I
Week 14	Therapeutic Diathermy II



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Webster, John G., ed. <i>medical instrumentation: application and design</i> . John Wiley & Sons, 2009.	yes
Recommended Texts	J.D.Bronzino ,Biomedical Engineering Handbook	
Websites		

Grading Scheme

مخطط الدرجات

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

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

د.د. هارون عبد الكاظم شهد
المعيد

رئيس القسم : أ.د. محمود شاكر نصر

عميد الكلية : أ.د. هارون عبد الكاظم شهد

رئيس القسم : أ.د. محمود شاكر نصر

اسم التدريسي: م.م علي توفيق لطيف

التاريخ : 2026 / 3 / 22

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

رئيس القسم : أ.د. محمود شاكر نصر

Module Information

معلومات المادة الدراسية



Module Title	Microcontrollers			Module Delivery	
Module Type	Elective I			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MIET4106				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGIV	Semester of Delivery		7
Administering Department		Type Dept. Code	College	Faculty of Engineering Techniques	
Module Leader	Ehsan najeh shamran		e-mail	ehsannajeh1992@gmail.com	
Module Leader’s Acad. Title		Assis. Lect.	Module Leader’s Qualification		M.Sc.
Module Tutor	Ehsan najeh shamran		e-mail	E-mail	
Peer Reviewer Name		Ehsan najeh shamran	e-mail	ehsannajeh1992@gmail.com	
Scientific Committee Approval Date		20/3/2026	Version Number		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Computer Programming and Applications (C++ programming) MIET3105	Semester	Five MIET3105
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To familiarize oneself with the various types of Arduino boards. 2. To acquire proficiency in programming Arduino using the C/C++ language. 3. To gain expertise in programming Arduino with MATLAB software. 4. To differentiate between digital and analog inputs on Arduino. 5. To enhance students' understanding of interfacing analog sensors with Arduino.



	6. To enhance students' understanding of interfacing digital sensors with Arduino. 7. To master the process of interfacing an LCD with Arduino. 8. To effectively program hardware interrupts and PWM on Arduino. 9. To educate students on generating different waveforms using Arduino. 10. To instruct students on utilizing Arduino's power-saving sleep modes. 11. To develop programs for data transmission and reception using Arduino. 12. To interface Arduino with WiFi, ZigBee, and Bluetooth technologies. 13. To interface Arduino with GPS and GSM modules. 14. To utilize the Arduino programming platform for Health Monitoring based on IoT.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Familiarizing oneself with the various types of Arduino boards. 2. Attaining proficiency in programming Arduino using the C/C++ language. 3. Acquiring expertise in programming Arduino using MATLAB software. 4. Distinguishing between digital and analog inputs in Arduino. 5. Enhancing students' understanding of interfacing analog sensors with Arduino. 6. Improving students' comprehension of interfacing digital sensors with Arduino. 7. Educating students on interfacing an LCD with Arduino. 8. Learning program hardware interrupts and PWM on Arduino. 9. Educating students on generating diverse waveforms using Arduino. 10. Instructing students on effectively utilizing Arduino's power-saving sleep modes. 11. Developing programs for data transmission and reception using Arduino. 12. Using Arduino with WiFi, ZigBee, and Bluetooth technologies. 13. Establishing interfaces between Arduino and GPS and GSM modules. 14. Employing the Arduino programming platform for IoT-based Health Monitoring.
Indicative Contents المحتويات الإرشادية	<u>Indicative Contents including the following:</u> - Arduino types, Programming Language in C/C++ and MATLAB [6 hrs]. - Instruction set for Digital and Analog Inputs of Arduino [2 hrs]. - Programming Analog and Digital Sensors, LCD, Hardware interrupts, PWM, [8 hrs]. - Programming Arduino to get sine, square, and triangle waves [2 hrs]. - Programming Arduino to utilize Power Saving Sleep Modes [2 hrs]. - Programming Arduino for data Transmission /Reception for two Arduinos, WiFi, ZigBee, Bluetooth, GPS, and GSM, and using IoT to transmit the sensor data to remote locations [8 hrs].

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The primary approach employed for delivering this module aims to foster the active engagement of students in programming various types of microcontrollers based on the Arduino platform. Simultaneously, it aims to enhance their program and deepen their understanding of microcontrollers in medical applica 

	experiments to accomplish this. The laboratory exercises will include the utilization of some components used in medical applications, ensuring an intriguing learning experience for the students.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2
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	5% (5)	5, 8	LO # 1-4, and 5-7
	Assignments	2	5% (5)	5, 12	LO # 1-4, and 5-10
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	14	All
Summative assessment	Midterm Exam	2 hr	20% (20)	12	LO # 1-11
	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 Arduino
Week 2	Arduino Programming Language in C/C++ (part 1)
Week 3	Arduino Programming Language in C/C++ (part 2)



Week 4	Arduino Programming based on MATLAB Software
Week 5	Digital and Analog Inputs of Arduino
Week 6	Interfacing Analog Sensors with Arduino Interfacing Digital Sensors with Arduino
Week 7	Midterm exam
Week 8	Interfacing LCD with Arduino
Week 9	Hardware Interrupt and PWM of Arduino
Week 10	Waveforms Generation based on Arduino
Week 11	Arduino Power Saving Sleep Modes
Week 12	Data Transmission/Reception based on Arduino
Week 13	Interfacing Arduino with WiFi, ZigBee, and Bluetooth
Week 14	Interfacing Arduino with GPS and GSM
Week 15	IoT-based Arduino for Health Monitoring Preparatory week before the Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Identify the types of microcontroller platforms and the difference between them
Week 2	Lab 2: Random number generation based on the Arduino platform and IDE software
Week 3	Lab 3: Blinking LED based on Arduino platform and IDE software
Week 4	Lab 4: interfacing Arduino with a push-button switch
Week 5	Lab 5: interfacing Arduino with Potentiometer
Week 6	Lab 6: interfacing Arduino with Light-Dependent Resistor (LDR)
Week 7	Lab 7: interfacing Arduino with Temperature sensor LM35
Week 8	Lab 8: interfacing Arduino with Ultrasound sensor
Week 9	Lab 9: interfacing Arduino with Servo motor
Week 10	Lab 10: Generating PWM based on the Arduino platform and IDE software
Week 11	Lab 11: Generating Square wave based on the Arduino platform and IDE software
Week 12	Lab 12: Generating triangle wave based on the Arduino platform and IDE software
Week 13	Lab 13: Generating text on LCD based on the Arduino platform and IDE software
Week 14	Lab 14: Generating symbols on LCD based on the Arduino platform and IDE software
Week 15	Lab 15: Data Transmission/Reception between two Arduinos



Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Arduino Cookbook , by Michael Margolis, March 2011: First Edition. Michael Margolis and Nicholas Weldin. Printed in the United States of America.	No
Recommended Texts	Arduino Applied: Comprehensive Projects for Everyday Electronics, by Neil Cameron Edinburgh, UK, 2019 by Neil Cameron	No
Websites	https://www.arduino.cc/	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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المعيد

عميد الكلية : أ.د. هارون عبد الكاظم شهد

التاريخ : 2026 / 3 / 20



رئيس القسم : أ.د. محمود شاكر نصر

التاريخ : 2026 / 3 / 20



اسم التدريسي: م.م احسان ناجح شمرا

التاريخ : 2026 / 3 / 20

