

Middle East University College



كلية الشرق الأوسط الجامعة



(Bologna Process)

مسار بولونيا

Department of medical instrumentation engineering technique

Middle East University College

الدورة الأولى (بكالوريوس _ هندسة تقنيات الأجهزة الطبية)

كلية الشرق الأوسط الجامعة

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1. Mission & Vision Statement

Vision Statement

Towards a medical engineering community whose members are practically empowered by providing a solid educational and research environment

Mission Statement

Providing scientific Curricula, practical laboratories, and advanced applied research to meet the needs of the labor market, openness to health institutions and contribute in improving health conditions at the local and global levels.

1. Program Specification

Programme code:	BSc-MIET	ECTS	240
Duration:	4 levels, 8 Semesters	Method of Attendance:	Full Time

MIET program is designed to provide students with the skills to improve themselves by preparing them for a career in medical instrumentation. Students will learn how to administer and support the medical instrumentation technology and designs

The curriculum consists of an integrated set of courses in mathematics, medical physics and chemistry, fundamentals of electric and electronic circuits, medical instrumentations.

Students will have the opportunity to know the principles of computer applications and they will be prepared for careers in companies of medical instrumentation dealing with the services, demonstrating general knowledge of medical devices categories and principal of operation. Moreover, the students will learn the various components of medical equipment.

Level 1 exposes students to the fundamentals of MIET, suitable for progression in engineering

fundamentals. Programmed-specific core topics are covered at Level 2 preparing for research-led

subject specialist modules at Levels 3 and 4. MIET graduates are therefore trained to appreciate how

research informs teaching, according to the University and School Mission statements.

At Levels 2, 3 and 4 MIET students understand the subject area and the professional fields of engineering mathematics, anatomy and physiology, electronic circuits, medical instrumentations,

electrical machines, digital electronics, English language, biomedical signal processing, medical

communication systems, biomedical transducers and sensors, control systems, electromagnetic field, elective subjects, medical laser systems, power electronics, and professional ethics which can be obtained during the course of study.

The research ethics is developed and fostered from the start via practical's, which are either embedded in lecture modules or taught in dedicated practical modules, research seminars and tutorials. There is a compulsory field course in Level 1, which students must pass in order to progress into Level 2, and optional field courses in Levels 2, 3 and 4. At Level 4 all students carry out independent research project.

2. Program Objectives

The Medical instrumentation techniques engineering Department aims to graduate applied engineers who are familiar with modern applications and devices in the field of medical devices and who are able to:

1. Preparing qualified engineers who have the ability to keep pace with the rapid development in the field of medical devices and provide them with the necessary skills to develop and modernize medical devices.
2. Installing and operating various electronic, electromechanical, diagnostic, therapeutic and laboratory medical devices.
3. Contributing and supervising the maintenance, maintenance and calibration of various medical devices.
4. Preparing and graduating an engineering staff with scientific and practical skills in diagnosing and repairing malfunctions resulting in medical devices.
5. Designing, developing and trying to find alternatives for some parts related to medical devices.
6. Scheduling and programming periodic maintenance work.

1. Student Learning Outcomes

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 openminded, interactive communication with non-experts.

Outcome 1

Understanding of allied knowledge

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.

Outcome 2

Oral and Written Communication

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

Outcome 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.

Outcome 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.

Outcome 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.

Outcome 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.

Outcome 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.

Outcome 8***Own professional development***

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

1. Academic Staff

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1. Credits, Grading and GPA

Credits

(Meddle East University College) is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1 ECTS is equivalent to 30 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

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:				

Number 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 "nearpass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

$$CGPA = [(1st^{th} module score \times ECTS) + (2nd^{th} module score \times ECTS) +] / 240$$

1. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
FEEN1101	Fundamentals of Electrical Engineering (DC)	79	71	6.00	C	
COMA1101	Computer Applications I (IC3)	49	26	3.00	B	
MATH1101	Differential Mathematics	78	47	5.00	S	
ENDR1101	Engineering Drawing	63	62	5.00	S	
DEHR1101	Democracy and Human Rights	33	17	2.00	B	
ENLG1101	English Language I	33	17	2.00	B	
MECH1101	Medical Chemistry	94	81	7.00	S	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
FEEN1211	Fundamentals of Electrical Engineering (AC)	79	71	6.00	C	FEEN1101
MEPH1201	Medical Physics	64	61	5.00	S	
MECH1201	Mechanics	48	52	4.00	S	
MATH1211	Integral Mathematics	78	47	5.00	S	MATH1101
ENWO1201	Engineering Workshops	63	62	5.00	S	
COMA1211	Computer Programming and Applications II	49	26	3.00	S	
ARLG1201	Arabic Language	33	17	2.00	B	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MEIL2101	Medical Instrumentation Laboratory I	94	81	7.00	C	
ELEC2101	Electronics Circuits I	79	71	6.00	C	FEEN1211
ELEM2101	Electrical Machines	79	71	6.00	C	FEEN1211
ENMT2101	Engineering Mathematics	78	47	5.00	S	MATH1211
ANPH2101	Anatomy & Physiology	64	36	4.00	S	
COBR2101	The crimes of the Ba'ath Regime in Iraq	33	17	2.00	B	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MEIL2211	Medical Instrumentation Laboratory II	94	81	7.00	C	MEIL2101
ELEC2211	Electronics Circuits II	79	71	6.00	C	ELEC2101
DIGE2201	Digital Electronics	79	46	5.00	C	ELEC2101
CCHI2201	Clinical Chemistry Instrumentation	64	61	5.00	C	
BTNS2201	Biomedical Transducers and Sensors	64	61	5.00	C	FEEN1211
ENLG2211	English Language II	33	17	2.00	B	ENLG1101

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MEDI3101	Medical Diagnostic Instrumentation I	79	96	7.00	C	ANPH2101
MICP3101	Microprocessor	94	56	6.00	C	DIGE2201
ELEF3101	Electromagnetic Fields	79	46	5.00	C	ENMT2101
SNSY3101	Signals and Systems	64	61	5.00	C	ENMT2101
COMA3101	Computer Programming and Applications II	64	36	4.00	S	
PROM3101	Project Management	48	27	3.00	S	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MEDI3211	Medical Diagnostic Instrumentation II	79	96	7.00	C	MEDI3101
MEES3201	Medical Electronic Systems	79	71	6.00	C	ELEC2211
MECS3201	Medical Communication Systems	64	61	5.00	C	SNSY3101
POEL3201	Power Electronics	79	46	5.00	C	ELEC2211
PROJ3201	Project I	33	42	3.00	S	
ADCP3211	Advanced Computer Programming	79	21	4.00	S	

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
METI4101	Medical Therapeutic Instrumentation I	79	96	7.00	C	ANPH2101
MELS4101	Medical Laser Systems	79	46	5.00	C	ANPH2101

CONS4101	Control Systems	79	46	5.00	C	ENMT2101
BSPR4101	Biomedical Signal Processing	64	36	4.00	C	ENMT2101
PROJ4101	Project II	48	77	5.00	C	PROJ3201
MICR4101	Microcontroller (elective)	64	36	4.00	E	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
METI4211	Medical Therapeutic Instrumentation II	79	96	7.00	C	METI4101
ENRI4201	Engineering of Radiation Instrumentation	79	71	6.00	C	
ALNR4201	Artificial Limbs and Robotics	94	56	6.00	C	CONS4101
BIPR4201	Biomedical Image Processing (elective)	64	36	4.00	E	
SBEN4201	Statistics for Biomedical Engineering (elective)	64	36	4.00	E	
PETH4201	Professional Ethics	48	27	3.00	B	

Electives | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
MICR4101	Microcontrollers	64	36	4.00	E	COMA3101
ANEN4101	Artificial Neural Engineering	64	36	4.00	E	COMA1211, MICP3101
PLD4101	Programmable Logic Devices	64	36	4.00	E	DIGE2201
BSN4201	Biomedical Sensors Networks	64	36	4.00	E	MECS3201
BIIP4201	Biomedical Image Processing	64	36	4.00	E	BSPR4101

SBEN4201	Statistics for Biomedical Engineering	64	36	4.00	E	ENMT2101
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8 Contact

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1. Overview

This catalogue is about the courses (modules) given by the program of medical instrumentation techniques engineer to gain the Bachelor degree. The program delivers (xx) Modules with (6000) total student workload hours and 240 total ECTS. The module delivery is based on the Bologna Process.

نظرة عامه

يتناول هذا الدليل المواد الدراسية التي يقدمها برنامج الهندسة الكهربائية للحصول على درجة البكالوريوس. يقدم البرنامج (xx) وحدات دراسية مع (٦٠٠٠) إجمالي ساعات حمل الطالب و ٢٤٠ إجمالي وحدات أوروبية. يعتمد تقديم المواد الدراسية على عملية بولونيا.

2. Undergraduate Courses 2024-2025

Module 1

Code	Course/Module Title	ECTS	Semester
FEEN1101	Fundamentals of Electrical Engineering (DC)	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/1	79	71
Description			
In the realm of direct current (DC), emphasis is on understanding current flow, mastering Kirchhoff's laws, and manipulating circuit configurations. Proficiency in managing parallel power sources and precision in circuit analysis are cultivated. DC serves as a foundational precursor before delving into the intricate domain of alternating current.			

Module 2

Code	Course/Module Title	ECTS	Semester
COMA1101	Computer Applications (IC3)	3	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	0/2/0/0	49	26
Description			
This module provides a foundation in computer hardware, software, operating systems, and peripherals. It covers understanding operating systems, computer hardware, power options, and utilizing the control panel. Learners will explore software types, Microsoft Office (Word, Excel, PowerPoint and outlook), and popular applications like G-Suite (Docs, Sheets, Slides, Gmail, Calendar).			

Module 3

Code	Course/Module Title	ECTS	Semester
MATH1101	Differential Mathematics	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/2	78	47
Description			
Differential mathematics is a branch of calculus that focuses on the concept of differentiation. It involves finding rates of change, slopes of curves, and optimizing functions. Differential equations are used to model various phenomena and solve problems in fields such as physics, and engineering.			

Module 4

Code	Course/Module Title	ECTS	Semester
ENDR1101	Engineering Drawing	5	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
	0/4/0/0	63	62
Description			
This course teaches engineering drawing fundamentals and AutoCAD usage, covering menus, toolbars, commands, and dimensioning techniques. Students learn to create accurate drawings following engineering drawing conventions and apply them in AutoCAD. They also explore the valuable utilities offered by AutoCAD for engineering drawing and study orthogonal projection in both traditional geometry and AutoCAD.			

Module 5

Code	Course/Module Title	ECTS	Semester
DEHR1101	Democracy and Human Rights	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	17
Description			
This course provides a comprehensive understanding of democracy as a way of life, its relationship with freedom, different public freedoms, and the traits, advantages, elements, and forms of democracy. It also covers election procedures and potential manipulation, Iraq's election laws, the development of democracy, constitutional and legal rights, human rights, and fostering a culture of dialogue and acceptance.			

Module 6

Code	Course/Module Title	ECTS	Semester
ENLG1101	English Language I	2	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	0/0/0/1	33	17
Description			
The beginner English language course introduces essential language skills for beginners. It covers basic grammar, vocabulary, listening, speaking, reading, and writing exercises. The course focuses on developing foundational English proficiency and building confidence in using English in everyday situations.			

Module 7

Code	Course/Module Title	ECTS	Semester
MECH1101	Medical Chemistry	7	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/2/0/1	94	81
Description			
<p>This course represents an introduction to the principles of chemistry, the definition of matter, systems of units of measurement, how to write chemical formulas and reaction equations and balance them for later use in mathematical calculations, in addition to the various ways to express the concentration of a substance and the decomposition constants of acids, bases, and poorly soluble salts as the theoretical basis for the qualitative and quantitative analysis of the practical approach. Moreover, focus on statistical treatments of the results of analyzes or to assess the efficiency of an analytical device or method.</p> <p>In addition to studying the interrelationship between chemistry and physics and the consequent laws, it also aims to study the states of matter and methods of conversion from one state to another with the properties of each of them and what is looking at the conversion of energy into work or vice versa, as well as the study of heat resulting from chemical reactions The various working principles and components of devices used for analytical purposes in chemistry, with a focus on spectrophotometers</p>			

Module 8

Code	Course/Module Title	ECTS	Semester
FEEN1211	Fundamentals of Electrical Engineering (AC)	6	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	79	71
Description			
<p>In the module Fundamentals of Electrical Engineering (AC), first-class engineering students delve into the core principles of electrical networks. From mastering Kirchhoff's laws to unraveling the intricacies of AC circuit analysis, students cultivate a comprehensive understanding of essential electrical engineering concepts. Topics encompass network theorems, delta-star conversions, and 3-phase systems, establishing a robust foundation for subsequent exploration in the field of electrical engineering.</p>			

Module 9

Code	Course/Module Title	ECTS	Semester
MEPH1201	Medical Physics	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	61
Description			
This module provides physics background for medical instrumentation engineers, covering forces in the body, physics of the skeleton, energy, work, and power. It explores the physics behind organ functions like respiratory, urinary, and cardiovascular systems, and introduces related instruments. It also includes the physics of hearing and highlights radiation therapy.			

Module 10

Code	Course/Module Title	ECTS	Semester
MECH1201	Mechanics	4	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/1	48	52
Description			
This module covered the fundamental concepts and principles of mechanics, and their applications in statics loads. Students comprehensively understand mechanics, including their forces, result of force, stress and strain, moment of force, friction, bending force, selective of materials, welding joint, and load distribution in trusses and bridge. They learn mechanical design, development, and various mechanical tests. Topics include mechanics /statics basics, mechanical properties, and mechanical test of materials.			

Module 11

Code	Course/Module Title	ECTS	Semester
MATH1211	Integral Mathematics	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/2	78	47
Description			
Integral mathematics is a branch of calculus that deals with the concept of integration. It involves finding the area under curves, calculating accumulated quantities, and solving differential equations. Integrals are used to analyze continuous functions and provide a framework for solving a wide range of mathematical and real-world problems.			

Module 12

Code	Course/Module Title	ECTS	Semester
ENWO1201	Engineering Workshops	5	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
-	0/4/0/0	63	62
Description			
<p>The Mechanical, Electrical and Electronic Workshop module aims to provide students with hands-on experience and theoretical knowledge in mechanical and electrical engineering. Overall, this module aims to provide students with practical skills and a theoretical understanding of Mechanical, Electrical and Electronic engineering, enabling them to work with machinery, manipulate metals, and work with electronic components and circuits.</p>			

Module 13

Code	Course/Module Title	ECTS	Semester
COMA1211	Computer Programming and Applications I	3	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	0/2/0/0	49	26
Description			
<p>This module covers the fundamental concepts of MATLAB programming language environment. The students will understand and learn how to use MATLAB as an effective programming language to solve different mathematical and engineering problems as well as using plotting functions and design projects using codes or GUI. Students will acquire the knowledge of basic MATLAB syntax such as: variables, input, output, vectors, matrices, functions, plotting, and GUI, and these topics will be illustrated using some examples. The students will gain the necessary skills to design and implement appropriate algorithms that solve problems dealing with different mathematical and engineering applications.</p>			

Module 14

Code	Course/Module Title	ECTS	Semester
ARLG1201	Arabic Language	2	2
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	17
Description			
<p>The course introduces the basic rules of the Arabic language, which can be used in the academic environment. The module involves teaching the concept of the Arabic language as a tool and means of communication between individuals. Introducing the student to the method of forming sentences using the tools of the Arabic language. Enabling the student to write using correct and basic linguistic and grammatical rules and their scientific applications.</p>			

Module 15

Code	Course/Module Title	ECTS	Semester
MEIL2101	Laboratory Medical Instrumentation I	7	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/1/0	94	81
Description			
<p>This module covers the fundamental concepts and principles of medical instrumentation. The topics explained in this module Definition of medical instruments. Introduction to medical instruments and Classification of medical instrumentation. Explain the Design of hospitals and the design of operating rooms. One of the most important topics is Patient Safety. Medical Laboratory Instruments and Tools. Calibration of Medical Laboratory Instruments. Introduction to Balance. Balance and their types. Wax bath and Water bath.</p>			

Module 16

Code	Course/Module Title	ECTS	Semester
ELEC2101	Electronics Circuits I	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/1	79	71
Description			
<p>This module covers various topics related to electrical circuits and semiconductor devices. Students learn about sinusoidal excitation, semiconductor materials, diode applications, bipolar junction transistors (BJTs), DC biasing of BJTs, field-effect transistors (FETs) and MOSFETs, FET biasing, BJT AC analysis, and small-signal AC analysis of BJT amplifiers. The module equips students with the knowledge and skills to design and analyze electronic circuits and devices.</p>			

Module 17

Code	Course/Module Title	ECTS	Semester
ELEM2101	Electrical Machines	6	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/2/0/0	79	71
Description			
<p>This course covers the basic concepts and principles of electricity technology and its applications. Where students understand and help them know the types of transformers, their applications, and designs, as well as the designs of electrical machines such as generators and motors, with direct current and alternating current and their components. It also deals with the methods of finding the appropriate design for the places used and their applications in medical devices and the results of mathematical quantities in designs through solving mathematical and mathematical problems for various applications. The students were also able to develop their capabilities in dealing with electrical parts in medical devices and methods of checking, maintaining, and repairing them.</p>			

Module 18

Code	Course/Module Title	ECTS	Semester
ENMT2101	Engineering Mathematics	5	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
3	0/0/0/2	78	47
Description			
Engineering mathematics is the application of mathematical principles and techniques to solve engineering problems. It encompasses various mathematical topics, including calculus, differential equations, linear algebra, probability theory, and numerical methods. Engineering mathematics provides a foundation for analyzing and designing engineering systems, from structures to electrical circuits.			

Module 19

Code	Course/Module Title	ECTS	Semester
ANPH2101	Anatomy & Physiology	4	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	36
Description			
In this course, the student is prepared to study and understand medical devices by explaining the physiological changes, especially the electrical ones, that occur when the body's various organs perform their function and their relationship to the devices used to measure and diagnose various phenomena and diseases. Moreover, the module prepares the student to study and understand medical devices by clarifying the physiological changes, especially the electrical ones, that occur when the body's various organs perform their function and their relationship to the devices used to measure and diagnose various phenomena and diseases.			

Module 20

Code	Course/Module Title	ECTS	Semester
COBR2101	The crimes of the Ba'ath Regime in Iraq	2	3
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	33	17
Description			
<p>This course aims to enhance students' understanding of crimes and violations at the Ba'ath regime in Iraq and their impact on individuals and society. It also encourages analysis and debate on these critical issues. One of the primary course objectives is for students to grasp the concept of crimes and their categories, study Ba'ath regime crimes and related laws, identify psychological and social offenses and their societal effects, analyze legal violations in Iraq (including human rights abuses), explore environmental crimes and their effects (e.g., pollution, urban and rural destruction, marshland drainage), and delve into mass grave crimes, cemetery events, and their chronological classification in Iraq.</p>			

Module 21

Code	Course/Module Title	ECTS	Semester
MEIL2211	Laboratory Medical Instrumentation II	7	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/1/0	94	81
Description			
<p>This module covers the fundamental concepts and principles of medical instrumentations and their classification. The main topics introduction to the laboratory Design and part from laboratory devices like centrifuges, the definition of microscopes, and Types of Microscopes. Polymerase chain reaction (pcr). definition of Laboratory incubators. types of Laboratory Incubators, ovens, and their medical application. Autoclave and its medical application. Water distillation. definition of the Rehabilitation System. Classification of Medical Rehabilitation System.</p>			

Module 22

Code	Course/Module Title	ECTS	Semester
ELEC2211	Electronics Circuits II	6	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/1	79	71
Description			
<p>The Electronics Circuits II course delves into advanced concepts in electronic circuits. Topics covered include amplifiers, oscillators, feedback systems, filters, and analog integrated circuits. Students learn to analyze, design, and optimize complex electronic circuits for applications in communication systems, audio amplification, and signal processing, furthering their understanding of electronic circuit theory and practical implementation.</p>			

Module 23

Code	Course/Module Title	ECTS	Semester
DIGE2201	Digital Electronics	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/2/0/0	79	46
Description			
<p>This module covers the basic concepts and fundamental principles of digital electronic circuits. The students understand comprehensively the applications of digital electronic circuits; include the work principles of medical instruments, which include these digital circuits. Furthermore, they can learn how to design, to develop, and to maintain these instruments.</p> <p>The subject of digital electronic circuits covers numbers of systems, digital codes, arithmetical processes, flip-flop circuits and arithmetical circuits. In addition, students learn designing of electronic counters and their work principles, shift-registers, and conversion process from digital to analog.</p>			

Module 24

Code	Course/Module Title	ECTS	Semester
CCHI2201	Clinical Chemistry Instrumentation	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	61
Description			
<p>This module covers the introduction of clinical chemistry and study the chemical and biochemical mechanism of the human body in relation to disease. Students comprehensively understand clinical chemistry instrumentation: spectrophotometer types, Auto-analyzer types, Electrophoresis, Elisa, Body mass index. They learn to explain their principal work, operation, maintenance, and faults. Topics include protein, fats, minerals, enzymes, and their importance in the human body. They understand the immunology concept and their effects on the human body.</p>			

Module 25

Code	Course/Module Title	ECTS	Semester
BTNS2201	Biomedical Transducers and Sensors	5	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/0/0/0	64	61
Description			
<p>The Biomedical Transducers and Sensors course explores the principles and applications of transducers and sensors in the biomedical field. Topics covered include sensor technologies, signal conditioning, measurement techniques, and the interface between sensors and biological systems. Students learn to select, design, and analyze biomedical sensors for accurate and reliable data acquisition in healthcare and research settings.</p>			

Module 26

Code	Course/Module Title	ECTS	Semester
ENLG2211	English Language II	2	4
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	1/0/0/0	33	17
Description			
The intermediate English language course, based on the New Headway Plus - develops language skills at an intermediate level. It covers grammar, vocabulary, listening, speaking, reading, and writing exercises. The course emphasizes building a solid foundation in English communication, comprehension, and expression, fostering confidence in everyday conversations and interactions.			

Module 27

Code	Course/Module Title	ECTS	Semester
MEDI3101	Medical Diagnostic Instrumentation I	7	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/1/0	79	96
Description			
<p>This module covers the fundamental concepts and principles of many medical diagnostic equipment and instrumentations that are used in hospitals and clinics. The students will understand the different parts of medical diagnostic instrumentation and the idea behind these parts as well as their operation. The student will be able to get the necessary knowledge to diagnose the faults may occur in each part and manage to fix it as well as develop some alternatives in emergencies. The students may gain skills to design and develop such instrumentations in the healthcare field. Medical diagnostic instrumentations are a form of medical equipment used to diagnose health conditions.</p> <p>Diagnostic medical equipment are important to healthcare because they assist providers in evaluating patient health. Having instruments to process testing samples and tools to measure critical vitals, such as body temperature and heart rate, can lead to better patient diagnoses and treatment. Many diagnostic instrumentations will be discussed thoroughly replicated by the biomedical recorders (ECG, EMG, EEG, EOG, VCG, PCG, Digital Stethoscope), Audiometers and Hearing Aids, Ophthalmic Instruments and Diagnostic Tests andetc . Once the diagnosis is performed, the doctor at that point refers to a proper treatment plan for the analyzed issue. Diagnostic medical equipment are important to healthcare because they assist providers in evaluating patient health. Having instruments to process testing samples and tools to measure critical vitals, such as body temperature and heart rate, can lead to better patient diagnoses and treatment. This module describe the physiological basis and engineering principles of electro-medical equipment, also includes information on the principles of operation and the performance parameters of a wide range of instruments. Broadly, this module covers recording and monitoring instruments, measurement and analysis techniques.</p>			

Module 28

Code	Course/Module Title	ECTS	Semester
MICP3101	Microprocessor	6	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/2/0/0	94	56
Description			
<p>This module covers the fundamental concepts and principles of microprocessors and their applications. Students comprehensively understand microprocessors, including their architecture, memory systems, I/O interfacing, instruction sets, timing, and standard buses. They learn to design, develop, and program (assembly language programming) microprocessor-based systems for various applications. Topics include microprocessor basics, semiconductor and auxiliary memories, microprocessor architecture, bus and I/O timing, microprocessor interfacing, instruction set architecture, digital and analog I/O, standard bus architectures, and practical microprocessors.</p>			

Module 29

Code	Course/Module Title	ECTS	Semester
ELEF3101	Electromagnetic Fields	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/1	79	46
Description			
<p>The electromagnetic fields course explores the principles and behavior of electromagnetic fields. Topics covered include electrostatics, magnetostatics, electromagnetic waves, and Maxwell's equations. Students learn about field interactions, propagation, and the application of electromagnetic theory to practical engineering problems in areas such as telecommunications, antennas, and electromagnetic compatibility.</p>			

Module 30

Code	Course/Module Title	ECTS	Semester
SNSY3101	Signals and systems	5	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	61
Description			
The signals and systems course introduces fundamental concepts and mathematical tools for analyzing continuous and discrete-time signals and systems. Topics covered include signal representation, Fourier analysis, convolution, Laplace and Z-transforms, and system characterization. The course focuses on understanding the behavior and properties of signals and systems in both time and frequency domains.			

Module 31

Code	Course/Module Title	ECTS	Semester
COMA3101	Computer Programming and Applications II	4	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	36
Description			
This module introduces beginners to computer programming and applications using the C++ programming language. Students learn the basics of C++ syntax, data types, control structures, functions, and object-oriented programming concepts. They gain hands-on experience through coding exercises and projects to develop practical programming skills and problem-solving abilities.			

Module 32

Code	Course/Module Title	ECTS	Semester
PROM3101	Project Management	3	5
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/0/0/0	48	27
Description			
<p>This course covers the basic concepts and principles of how to manage projects, modern methods of planning projects, methods of applying them, setting timetables for them, studying all theories in planning, and finding out the weaknesses and strengths of each theory. Students also understand how to do a feasibility study for projects, calculate costs of all kinds, and calculate annual profits and losses in different ways through the use of international accounting theories followed and studies in managing and creating projects and proposing suitable solutions to keep pace with the needs of the labor market and what society needs of graduates in the field of engineering in the field of medical devices and developing their skills Knowledge, accounting and planning.</p>			

Module 33

Code	Course/Module Title	ECTS	Semester
MEDI3211	Medical Diagnostic Instrumentation II	7	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/1/0	79	96
Description			
<p>This module considers technological innovations and introduction of new and improved methods of medical diagnosis systems, capturing recent developments and discussing new topics. This module includes subjects on 'Telemedicine Technology', which shows how information and communication technologies have made significant contribution in better diagnosis and treatment of patients and management of health facilities. This module describes the engineering principles of imaging systems and equipment's such as X-ray Machines and Digital Radiography. Further, it includes information on the principles of operation and the performance parameters of a wide range of imaging systems. Broadly, this module covers a wide range of modern imaging systems such as Modern Ultrasound Imaging Systems, Three – Dimensional Ultrasound Imaging Systems, Portable Ultrasound Systems, Thermal Imaging Systems and Magnetic Resonance Microscopy. Having a discussion on applications of new topics, including Gamma Knife, Cyber Knife, Multislice CT Scanner, Digital Radiography, Single- Photon – Emission Computed Tomography (SPECT), Gamma Camera, Positron Emission Tomography (PET) Scanner.</p>			

Module 34

Code	Course/Module Title	ECTS	Semester
MEES3201	Medical Electronic Systems	6	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/2/0/0	79	71
Description			
<p>This module provides an in-depth exploration of medical electronic systems, focusing on the principles, technologies, and applications that underpin the field of medical electronics. Students will gain a comprehensive understanding of the design, operation, and integration of electronic systems used in various medical disciplines, including healthcare monitoring, diagnostics, therapeutic devices, and imaging systems. The module aims to equip students with the knowledge and skills necessary to analyze, design, and evaluate medical electronic systems. Students will learn about the regulated power supplies, clippers circuits, operational amplifiers applications, filters and data analysis methods employed in medical electronics. They will also explore the regulatory frameworks and standards governing the development and deployment of medical electronic systems.</p>			

Module 35

Code	Course/Module Title	ECTS	Semester
MECS3201	Medical Communication systems	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	61
Description			
<p>The communication course focuses on developing effective verbal and written communication skills. Topics covered include interpersonal communication, public speaking, business writing, and nonverbal communication. Students learn to express ideas clearly, listen actively, and adapt their communication style to various contexts, fostering effective communication in personal and professional interactions.</p>			

Module 36

Code	Course/Module Title	ECTS	Semester
POEL3201	Power Electronics	5	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/2/0/0	79	46
Description			
<p>This module covers the fundamental concepts and principles of power electronics and their applications. Students comprehensively understand the application of power electronics, including their Rectifier, chopper, ac-ac controller, inverter. They learn to design, develop, power supply, UPS, switch mode power supply for various applications. Topics include thyristor, transistor, diode as switch This module covers the fundamental concepts and principles of power electronics and their applications. Students comprehensively understand the application of power electronics, including their Rectifier, chopper, ac-ac controller, inverter. They learn to design, develop, power supply, UPS, switch mode power supply for various applications. Topics include thyristor, transistor, diode as switches and state of different type of power electronics applications.</p>			

Module 37

Code	Course/Module Title	ECTS	Semester
PROJ3201	Project I	3	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
1	0/0/0/0	33	42
Description			
<p>The project for medical instrumentation engineering techniques is designed to provide students with hands-on experience in applying their knowledge of medical instrumentation to solve real-world problems. The project focuses on the practical aspects of designing, building, and testing medical devices and systems. The junior project is a valuable learning experience that allows students to integrate theoretical knowledge with practical skills. It helps them develop critical thinking, teamwork, and communication skills, essential for success in medical instrumentation engineering. Students work in teams and are assigned a specific problem or challenge related to medical instrumentation. They must research and understand the problem, identify the appropriate engineering techniques and methodologies to address it and develop a solution. The project typically involves the following stages that are considered the first steps in the project:</p> <p>Problem Definition: Students begin by clearly defining the problem they aim to solve. This includes understanding the project's requirements, constraints, and objectives and searching for the main components related to the project design based on the new scientific research.</p> <p>Design and Planning: Students develop a detailed design plan that outlines the steps, resources, and timeline required to complete the project. They may need to consider safety, regulatory compliance, and user requirements.</p>			

Module 38

Code	Course/Module Title	ECTS	Semester
ADCP3211	Advanced Computer Programming	4	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/2/0/0	79	21
Description			
In the Python introductory module, students explore tailored programming fundamentals, mastering essential concepts for engineering applications. Through hands-on projects and real-world examples, this module equips learners to harness Python's power in engineering endeavors adeptly.			

Module 39

Code	Course/Module Title	ECTS	Semester
METI4101	Medical Therapeutic Instrumentation I	7	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/1/0	79	96
Description			
This module covers the fundamental concepts and principles of many medical therapeutic instruments that are used in hospitals and clinics. The students will understand the different parts of medical therapeutic instrumentation and the idea behind these parts as well as their operation. The student will be able to get the necessary knowledge to diagnose the faults that may occur in each part and manage to fix them as well as develop some alternatives in emergencies. The students may gain skills to design and develop such instrumentations in the healthcare field. Many instruments will be discussed thoroughly like electrosurgical machines, heart-lung machines, hemodialysis machines, dental chairs, and many other important therapeutic instruments.			

Module 40

Code	Course/Module Title	ECTS	Semester
MELS4101	Medical Laser Systems	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/2/0/0	79	46
Description			
This module covers the fundamental concepts of laser generation, optical fiber, medical laser types, laser detector and laser medical application. Students comprehensively understand the medical laser types that are used in appropriate medical laser applications, including therapy treatment and medical surgery. They learn to design, develop, and program medical laser devices. Topics include gases laser like CO ₂ , semiconductor laser and optical fiber as a delivery laser system.			

Module 41

Code	Course/Module Title	ECTS	Semester
CONS4101	Control Systems	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/2/0/0	79	46
Description			
Control systems are very important in robotics which are used in biomedical applications. This module covers the use of feedback control for linear time-invariant systems, including the design of PD, PI and PID controllers, and the implementation of controllers using digital techniques. Also, the stability of medical instrumentation is very important to check it before used in the medical field. The laboratory sessions make use of a medical wheeled robot or any smart medical device with line-following sensors, and give practical experience of modelling, controller design, and controller implementation.			

Module 42

Code	Course/Module Title	ECTS	Semester
BSPR4101	Biomedical Signal Processing	4	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	36
Description			
The biomedical signal processing course provides an overview of techniques used to analyze and interpret signals from the human body. Characteristics of medical data, physiological signals analyzer, medical care system, nature of biomedical signals, signal acquisition. Also, random physiological signals,			

signal as stochastic process, averaging techniques, sampling theorem, windowing and many other topics will cover during the module. The course emphasizes the application of these techniques in medical diagnostics, monitoring, and research, fostering skills in biomedical signal analysis and interpretation.

Module 43

Code	Course/Module Title	ECTS	Semester
PROJ4101	Project II	5	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
-	0/2/1/0	48	77
Description			
<p>Prototyping and Construction: Students use their engineering skills to build prototypes or models of medical instruments or systems. They may need to fabricate components, integrate sensors and actuators, and develop the necessary circuitry or software.</p> <p>Testing and Evaluation: Students rigorously test their prototypes to ensure they meet the specified requirements and function as intended. They may conduct experiments, collect data, and analyze the performance of their device or system.</p> <p>Documentation and Presentation: Students document their project work, including design drawings, test results, and any modifications made during the development process. They prepare a final report and present their findings to faculty members or a panel of judges.</p> <p>Throughout the project, students are encouraged to apply engineering principles, problem-solving skills, and their understanding of medical instrumentation concepts. They may also collaborate with healthcare professionals or industry experts to gain insights into the practical application of their projects.</p> <p>The project is a valuable learning experience that allows students to integrate theoretical knowledge with practical skills. It helps them develop critical thinking, teamwork, and communication skills, essential for success in medical instrumentation engineering techniques.</p>			

Module 44-Elective I

Code	Course/Module Title	ECTS	Semester
MICR4101	Microcontrollers	4	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	36
Description			
<p>This module provides an in-depth exploration of the fundamental concepts and principles underlying microcontrollers and their applications. Students will gain a comprehensive understanding of different types of Arduino microcontrollers, including their platforms and the programming languages employed, such as C/C++ and MATLAB. They will learn how to design, develop, and program microcontroller-based systems specifically tailored for various biomedical applications. Key topics covered in this module include instruction set for digital and analog inputs of Arduino, programming analog and digital sensors,</p>			

utilizing LCDs, handling hardware interrupts, implementing pulse width modulation, generating sine, square, and triangle waves, exploiting power-saving sleep modes, data transmission and reception between two Arduinos, incorporating wireless technologies like Wi-Fi, ZigBee, Bluetooth, GPS, and GSM, leveraging the internet of things (IoT) to transmit and receive sensor data to and from remote locations. This module will teach students the knowledge and skills to utilize microcontrollers in biomedical applications effectively.

Module 44-Elective I

Code	Course/Module Title	ECTS	Semester
ANEN4101	Artificial Neural Engineering	4	7
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	36
Description			
Artificial neural engineering involves the design and development of artificial neural networks, inspired by the structure and function of the human brain, to solve complex problems and perform tasks such as pattern recognition, data analysis, and decision-making.			

Module 45

Code	Course/Module Title	ECTS	Semester
METI4211	Medical Therapeutic Instrumentation II	7	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/1/0	79	96
Description			
This module covers the fundamental concepts and principles of many medical therapeutic instruments that are used in hospitals and clinics. The students will understand the different parts of medical therapeutic instrumentation and the idea behind these parts as well as their operation. The student will be able to get the necessary knowledge to diagnose the faults that may occur in each part and manage to fix them as well as develop some alternatives in emergencies. The students may gain skills to design and develop such instrumentations in the healthcare field. Many instruments will be discussed thoroughly like Artificial organs, Mechanical ventilator, anesthesia machine, stereotactic radiosurgery systems and many other important therapeutic instruments.			

Module 46

Code	Course/Module Title	ECTS	Semester
ENRI4201	Engineering of Radiation Instrumentation	6	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/1/0	79	71
Description			
<p>The Engineering of Radiation Instrumentation course focuses on the design and development of instruments used in radiation-related fields. Topics covered include atomic structure and atomic radiation, Radiation detection & engineering of radiation detectors , Engineering of radiation dosimetry and dosimeters . Moreover, the student will understand the Clinical radiation generators., Dose distribution and scatter analysis, Engineering of electron beam therapy, and many other related topics . Students gain practical skills in designing radiation detectors, analyzing data, and implementing radiation measurement systems for applications in nuclear science, medical imaging, and radiation safety.</p>			

Module 47

Code	Course/Module Title	ECTS	Semester
ALNR4201	Artificial Limbs and Robotics	6	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	2/2/0/0	94	56
Description			
<p>These modules cover artificial Limbs and robotics which allows for flexible instruments in the surgical platform to be introduced into the body for purposes of performing surgery using motors to orient and move the instruments within a body cavity. The robotics system includes a component(s) through which flexible instruments can be inserted into the body. This component can receive a flexible instrument and use the motors to move the flexible instrument in multiple degrees of freedom. This module presents a system of one or more computer-controlled manipulators and mechanical arms that operates autonomously or is operated remotely (e.g., teleoperated) by a human, including attachable components or assemblies that operate as part of (and not separately from) such a system during any medical or surgical diagnosis, treatment, or procedure. Since robotic systems allow the development of minimally invasive endoscopic cardiac surgery. These systems help overcome the difficulties inherent in conventional endoscopic microsurgery. Two robotic systems are currently used in cardiac surgery: (1) the Zeus system developed by Computer Motion (Goleta, CA); and (2) the DaVinci system developed by Intuitive Surgical (Mountain View, CA). The module will introduce students to the fundamentals of robotic systems including kinematics and dynamics as applied to manipulators and mobile robots., learning how to support many application sensors are required, the module will discuss tactile and vision sensing as applied to both fixed and mobile robots. Help students to understand how biological systems have influenced the development of current and future robotic systems, including swarms and humanoid robotic systems. This module is used to provide students with a solid understanding of</p>			

robotics fundamentals, and to cover their designs and the workspace of robot. Describe and identify the common types of robots and the applications of robot according to their design. It will help students to recognize state-of-the-art systems and methods for robotic and computer-assisted surgeries.

Module 48-Elective II

Code	Course/Module Title	ECTS	Semester
PLD4101	Programmable Logic Devices	4	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	36
Description			
<p>systems based on PLDs specifically tailored to diverse applications. Key topics covered in this module include Random Access Memories (RAMs), containing Static RAMs (SRAMs) and Dynamic RAMs (DRAMs), Read-Only Memories (ROMs), such as Mask ROMs, Diode Matrix ROMs, EEPROMs, PROMs and flash memories and specialized memory types like FIFO and LIFO, maximal code generation, which comprises maximal code, Gold code, Barker codes, and non-linear codes, combinational logic gates, containing binary adders/subtractors, decoders, and multiplexers, sequential circuits, such as flip-flops and registers, programmable logic array (PLA) and programmable array logic (PAL), a complex programmable logic device (CPLD) and field programmable gate array (FPGA), and programming gates, including AND, NAND, OR, NOR, XOR, and XNOR gates, using the VHDL language. By completing this module, students will acquire the necessary knowledge and skills to effectively employ programmable logic devices in various applications, enabling them to design and implement systems that leverage the capabilities of PLDs.</p>			

Module 48-Elective II

Code	Course/Module Title	ECTS	Semester
BSN4201	Biomedical Sensors Networks	4	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	36
Description			
<p>This module comprehensively explores the fundamental concepts and principles related to Biomedical Sensor Networks and their extensive applications in the biomedical field. Students will develop a thorough understanding of Biomedical Sensor Networks, including their various types, topologies, and the performance techniques utilized to configure them. They will learn how to design, develop, and implement systems based on Biomedical Sensor Networks specifically tailored to diverse biomedical applications. Key topics covered in this module include the concept of biomedical sensor networks, biomedical sensors and signal acquisition, sensor data processing and feature extraction, wireless communication protocols such as Bluetooth, Wi-Fi, Zigbee, etc., energy management and power</p>			

optimization data fusion and integration, localization and tracking within biomedical sensor networks, wearable biomedical sensors for continuous vital sign monitoring, wireless power transfer for implanted devices in sensor networks, internet of things (IoT) and cloud computing in biomedical sensor networks, data analytics and machine learning in biomedical sensor networks, biomedical sensor networks for disease monitoring and management, security and privacy considerations in biomedical sensor networks, emerging trends and future directions in the field. By completing this module, students will acquire the necessary knowledge and skills to utilize Biomedical Sensor Networks in various applications effectively. They will be equipped to design and implement networks that leverage the capabilities of Biomedical Sensor Networks, enabling advancements in the biomedical field.

Module 49- Elective III

Code	Course/Module Title	ECTS	Semester
BIIP4201	Biomedical Image Processing	4	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	36
Description			
The biomedical image processing course explores techniques for analyzing and enhancing medical images. Topics covered include image acquisition, preprocessing, segmentation, registration, and feature extraction. Students learn to apply image processing algorithms to improve image quality, detect anomalies, and extract meaningful information for medical diagnosis and research purposes.			

Module 49- Elective III

Code	Course/Module Title	ECTS	Semester
SBEN4201	Statistics for Biomedical Engineering	4	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	0/2/0/0	64	36
Description			
The statistics course provides a foundation in statistical theory and methods. Topics covered include sampling and descriptive statistics, probability, propagation of error. Students learn how to commonly Used Distributions. The student takes knowledge about Confidence intervals and hypothesis testing. The course emphasizes the application of statistical methods in various fields, including research, business, and decision-making.			

Module 50

Code	Course/Module Title	ECTS	Semester
PETH4201	Professional Ethics	3	8
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	1/0/0/0	48	27
Description			
The Professional Ethics course examines ethical principles and values in professional settings. Topics covered include integrity, confidentiality, responsibility, and ethical decision-making. Students explore real-world case studies and develop ethical reasoning skills to navigate complex professional dilemmas. The course fosters an understanding of ethical responsibilities and promotes ethical behavior in various professions and industries.			

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المنهاج الدراسي لقسم
هندسة تقنيات الأجهزة الطبية



Republic of Iraq - Ministry of Higher Education and Scientific Research
Middle East University College
Bachelor's degree in Medical Instrumentation techniques engineer (First cycle)
Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr
Program Curriculum (2023 - 2024)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي
كلية الشرق الأوسط الجامعة / قسم هندسة تقنيات الأجهزة الطبية
بكالوريوس علوم في هندسة تقنيات الأجهزة الطبية (الدورة الأولى)
أربع سنوات (ثمانية فصول دراسية) - 240 وحدة ائتمانية - كل وحدة ائتمانية = 25 ساعة
المناهج الدراسية للعام ٢٠٢٣-٢٠٢٤



Level	Semester	No.1	Module Code	Module Name in English	اسم المادة الدراسية	Language	CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semns (hr/w)	Exam hr/sem	SSWL hr/sem	USWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
First		1	MAT011	Mathematics	رياضيات	English	3				1			4	64	86	150	6.00	B	
		2	EEO011	Principles of electrical engineering	مبادئ الهندسة الكهربائية	English	2		3	1	1			4	109	91	200	8.00	B	
		3	MCH011	Mechanics	الميكانيك	English	2				2			4	64	86	150	6.00	B	
		4	ENL011	English Language	اللغة الانكليزية	English	2							3	33	17	50	2.00	C	
		5	MIC011	Medical Chemistry	الكيمياء الطبية	English	2		2	1	1			4	94	106	200	8.00	C	
		6	ARL012	Arabic language	اللغة العربية	Arabic	2							3	33	17	50	2.00	C	
						Total	13	0	5	2	5	0	21	461	403	750	32.00			
UGI	Semester	No.2	Module Code	Module Name in English	اسم المادة الدراسية	Language	CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semns (hr/w)	Exam hr/sem	SSWL hr/sem	USWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
	Second	1	WOR012	workshop	معامل	Arabic			4	1				4	79	46	125	5.00	B	
		2	MIPY012	Medical physics	فيزياء طبية	English	2		2	1	1			4	94	106	200	8.00	B	
		3	COA012	computer application	تطبيقات الحاسبة	English	1		2					4	49	126	175	7.00	B	
		4	END012	Engineer drawing	الرسم الهندسي	English			4			1		3	78	22	100	4.00	C	
		5	HUR012	Human Rights and Democracy	حقوق الانسان وديمقراطية	Arabic	2							3	33	67	100	4.00	C	
						Total	5	0	12	2	2	0.00	18	333	367	700	28	C		
Total							18	0	17	4	7	0	39	794	770	1450	60.00	Must be 240 ECTS		

Note: The student should complete 4 weeks of Summer Internships to fulfill the requirements of the Bachelor's degree

Structured SWL (hr/w) type	CL	Lab	Pr	Tut	Lect	Semn	Module type	B	C	S	E	SWL	SSWL	USSWL
	Class Lecture	Laboratory	Practical Training	Tutorial	Online lecture	Seminar		Basic learning activities	Core learning activity	Support or related learning activity	Elective learning activity	Student Workload	Structured SWL	Unstructured SWL
Note: Columns Q, Q and R are programmed, protected and should not be edited														



Republic of Iraq - Ministry of Higher Education and Scientific Research
Middle East University College
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Program Curriculum (2024 - 2025)

جمهورية العراق - وزارة التعليم العالي والبحث العلمي
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المناهج الدراسية للعام ٢٠٢٥-٢٠٢٤



Level	Semester	No.1	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)								
Three		1	MEIL2101	Laboratory Medical Instrumentation I	الأجهزة الطبية المختبرية I	English	2		2	1			1	4	94	81	175	7.00	C	
		2	ELEC2101	Electronics Circuits I	دوائر الالكترونية I	English	2		2			1		4	79	46	125	5.00	C	FEEN1211
		3	ELEM2101	Electrical Machines	مكائن كهربائية	English	2	1	2					4	79	46	125	5.00	C	FEEN1211
		4	ENMT2101	Engineering Mathematics	الرياضيات الهندسية	English	3					1		3	63	37	100	4.00	S	MATH1211
		5	ANPH2101	Anatomy & Physiology	علم التشريح وعلم وظائف الأعضاء	English	2		2					4	64	36	100	4.00	S	
		6	ENLG2111	English Language II	اللغة الانكليزية II	English	1	1						3	33	17	50	2.00	B	ENLG1101
		7	COMA2101	Computer Applications	تطبيقات الحاسوب	English	1		2					4	49	26	75	3.00	B	
						Total	13	1	10	1	2	1	26	461	289	750	30.00			
UGII	Semester:	No.2	Module Code	Module Name in English	اسم المادة الدراسية	Language	CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)	Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
	Four	1	MEIL2211	Laboratory Medical Instrumentation II	الأجهزة الطبية II	English	2		2	1			1	4	94	81	175	7.00	C	MEIL2101
		2	ELEC2211	Electronics Circuits II	دوائر الالكترونية II	English	2		2			1		4	79	71	150	6.00	C	ELEC2101
		3	DIGE2201	Digital Electronics	الإلكترونيات الرقمية	English	2	1	2					4	79	46	125	5.00	C	ELEC2101
		4	CCHI2201	Clinical Chemistry Instrumentation	الأجهزة الكيميائية السريرية	English	2		2					4	64	61	125	5.00	C	
		5	BTNS2201	Biomedical Transducers and Sensors	المحولات والمستشعرات الطبية الحيوية	English	2		2					4	64	61	125	5.00	C	FEEN1211
		6	COBR2201	The crimes of the Ba'ath Regime in Iraq	جرائم نظام البعث في العراق	Arabic	2							3	33	17	50	2.00	B	
						Total	12	1	10	1	1	1.00	23	413	337	750	30.00			
Total							25	2	20	2	3	2	49	794	626	1500	60.0			

Note: The student should complete 4 weeks of Summer Internships to fulfill the requirements of the Bachelor's degree

Structured SWL (hr/w) type	CL	Lab	Pr	Tut	Lect	Sem	Module type	B	C	S	E	SWL	SSWL	USSWL
	Class Lecture	Laboratory	Practical Training	Tutorial	Online lecture	Seminar		Basic learning activities	Core learning activity	Support or related learning activity	Elective learning activity	Student Workload	Structured SWL	Unstructured SWL
Note: Columns Q, Q and R are programmed, protected and should not be edited														





Republic of Iraq - Ministry of Higher Education and Scientific Research
Middle East University College
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Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr
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جمهورية العراق - وزارة التعليم العالي والبحث العلمي
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المنهاج الدراسي للعام ٢٠٢٤-٢٠٢٥



Level	Semeste	No.1	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)							Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)									
UGIII	Five	1	MEDI3101	Medical Diagnostic Instrumentation I	أجهزة التشخيص الطبية I	English	2			2	1			4	79	96	175	7.00	C	ANPH2101	
		2	MICP3101	Microprocessor	المعالج الميكرو	English	2	2	2					4	94	56	150	6.00	C	DIGE2201	
		3	ELEF3101	Electromagnetic Fields	المجالات الكهرومغناطيسية	English	2			2		1		4	79	46	125	5.00	C	ENMT2101	
		4	SNSY3101	Signals and Systems	الإشارات و الأنظمة	English	2	2	2					4	64	61	125	5.00	C	ENMT2101	
		5	COMA3101	Computer Programming and Applications II	برمجة الحاسوب وتطبيقاته II	English	2	2						4	64	36	100	4.00	S		
		6	PROM3101	Project Management	إدارة مشاريع	English	2						1	3	48	27	75	3.00	S		
							Total	12	2	10		1	1	1	23	428	322	750	30.00		
	Six	Semeste	No.2	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)							Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code
			1	MEDI3211	Medical Diagnostic Instrumentation II	أجهزة التشخيص الطبية II	English	2			2	1			4	79	96	175	7.00	C	MEDI3101
			2	MEES3201	Medical Electronic Systems	نظم إلكترونية طبية	English	2	2	1	2				4	79	71	150	6.00	C	ELEC2211
			3	MECS3201	Medical Communication Systems	نظم الاتصالات الطبية	English	2			2				4	64	61	125	5.00	C	SNSY3101
			4	POEL3201	Power Electronics	إلكترونيات القدرة	English	2	2	1	2				4	79	46	125	5.00	C	ELEC2211
			5	PROJ3201	Project I	مشروع I	English	1						1	3	33	42	75	3.00	S	
			6	ADCP3211	Advanced Computer Programming	برمجة الحاسوب المتقدمة	English	2	2	1	2				4	79	21	100	4.00	S	
						Total	11	3	10		1	0	1.00	23	413	337	750	30.00			
							Total	23	5	20	2	1	2	46	794	659	1500	60.0	Must be 240 ECT		

Note: The student should complete 4 weeks of Summer Internships to fulfill the requirements of the Bachelor's degree

Structured SWL (hr/w) type	CL	Class Lecture	Module type	B	Basic learning activities	SWL: Student Workload
	Lab	Laboratory		C	Core learning activity	SSWL: Structured SWL
	Pr	Practical Training		S	Support or related learning activity	USSWL: Unstructured SWL
	Tut	Tutorial		E	Elective learning activity	
	Lect Sem	Online lecture Seminar				
Note: Columns O, Q and R are proogramed, protected and should not be edited						



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المنهاج الدراسي للعام ٢٠٢٤-٢٠٢٥



Level	Semester	No.1	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code	
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)								
UGIV	Seven	1	METI4101	Medical Therapeutic Instrumentation I	الأجهزة العلاجية الطبية I	English	2			2	1			4	79	96	175	7.00	C	ANPH2101
		2	MEL4101	Medical Laser Systems	أنظمة الليزر الطبية	English	2	1		2				4	79	46	125	5.00	C	ANPH2101
		3	CONS4101	Control Systems	نظم التحكم	English	2	1		2				4	79	46	125	5.00	C	ENMT2101
		4	BSPR4101	Biomedical Signal Processing	معالجة الإشارات الطبية الحيوية	English	2	1						4	64	36	100	4.00	C	ENMT2101
		5	PROJ4101	Project II	مشروع II	English				2	1			3	48	77	125	5.00	C	PROJ3201
		6	MICR4101	Microcontroller (Elective I)	الميكروالترابطة الاختيارية	English	2			2				4	64	36	100	4.00	E	
							Total	10	2	12	2	0	0	23	413	337	750	30.00		
UGIV	Eight	1	METI4211	Medical Therapeutic Instrumentation II	الأجهزة العلاجية الطبية II	English	2			2	1			4	79	96	175	7.00	C	METI4101
		2	ENRJ4201	Engineering of Nanomaterials	هندسة المواد النانوية	English	2			2	1			4	79	71	150	6.00	C	
		3	ALNR4201	Artificial Limbs and Robotics	الأطراف الاصطناعية والروبوتات	English	2	2		2	1			4	94	56	150	6.00	C	CONS4101
		4	BIPR4201	Biomedical Image Processing (Elective II)	معالجة الصور الطبية الحيوية	English	2			2				4	64	36	100	4.00	E	
		5	SBEN4201	Statistics for Biomedical Engineering (Elective III)	إحصاءات الهندسة الطبية الحيوية	English	2			2				4	64	36	100	4.00	E	
		6	PETH4201	Professional Ethics	أخلاقيات المهنة	Arabic	2	1						3	48	27	75	3.00	E	
							Total	12	3	10	2	0	0.00	23	428	322	750	30.00		
							Total	22	5	22	4	0	0	46	841	659	1500	60.0		Must be 240

Note: The student should complete 4 weeks of Summer Internships to fulfill the requirements of the Bachelor's degree

Structured SWL (hr/w) type	CL	Class Lecture	Module type	B	Basic learning activities	SWL: Student Workload
	Lab	Laboratory		C	Core learning activity	SSWL: Structured SWL
	Pr	Practical Training		S	Support or related learning activity	USSWL: Unstructured SWL
	Tut	Tutorial		E	Elective learning activity	
	Lect	Online lecture				
	Sem	Seminar	Note: Columns O, Q and R are programmed, protected and should not be edited			



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Differential Mathematics		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MIET1103		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGI	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Ali Amer Ahmed	e-mail	Ali.amer@gmail.com
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki	e-mail	Saad.a.reda@meuc.edu.iq
Scientific Committee Approval Date	11/11/2023	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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 <p>Midterm</p> <ol style="list-style-type: none"> 8. Discuss Chain rules and applications of the derivatives. 9. Define <i>determinants</i> and understand their relation to matrices · Also explain the methodology for finding a <i>determinant</i>. 10. Learn how to solve Linear equations by Cramer's rule.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> 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 hrs] 4. Revision problem classes [5 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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
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

Learning and Teaching Resources

مصادر التعلم والتدريس

	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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Fundamentals of Electrical Engineering (AC)		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MIET1201		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	2
Administering Department	MIET	College	EETC
Module Leader	Shahad Nidhal Alyousif	e-mail	Dr.shahad@meuc.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D
Module Tutor	Shahad Nidhal Alyousif	e-mail	Dr.shahad@meuc.edu.iq
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki	e-mail	Saad.a.reda@meuc.edu.iq
Scientific Committee Approval Date	8/11/2023	Version Number	.0\

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Fundamentals of Electrical Engineering (DC)	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand capacitance, inductance and resistance from an AC circuit. 3. To learn the basic concept of First-Order electrical circuits. 4. To explain the parallel and series circuits. 5. To understand Sinusoids and Phasors problems. 6. To perform AC- network theorem. 7. To perform AC Power Analysis. 8. To understand 3-phase system.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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 capacitance, inductance and resistance. 5. Define First-Order electrical circuits' voltage, resistance, and current. 6. Identify the basic circuit elements and their applications. 7. Discuss the operations of sinusoids and phasors in an electric circuit. 8. Discuss the various properties of resistors, capacitors, and inductors. 9. Explain the parallel and series circuits. 10. Identify the capacitor and inductor phasor relationship with respect to voltage and current. 11. Learn the 3-Phase system, Wye connection and Delta connection. 12. Identify the power in balance phase circuit. 13. Describe the Magnetism and Magnetic Circuits
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>AC circuits I – Generation of alternating current, Sinusoidal current. The mean values of current and voltage. [15 hrs]</p> <p>AC Circuits II - The effective values of current and voltage. The vector diagram, [10 hrs]</p> <p>The instantaneous power and mean power of A.C , relative and apparent power . [10 hrs]</p> <p>Revision problem classes [8 hrs]</p> <p>3-Phase system, Wye connection, and Delta connection [10 hrs]</p> <p>The power in balance phase circuit. [7 hrs]</p> <p>Revision problem classes [5 hrs]</p>

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>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.</p>

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	150		

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Generation of alternating current, Sinusoidal current
Week 2	Average and RMS values of current & voltage
Week 3	AC in resistive circuits Current & voltage in an inductive circuit
Weeks 4-6	Current and voltage in an capacitive circuits AC series and parallel circuit RL, RC and RLC circuit analysis & phasor representation
Week 7	Mid-term exam
Weeks 8-11	Power in resistive circuits Power in inductive and capacitive circuits Power in circuit with resistance and reactance Measurement of power in a single-phase AC circuit
Week 12-15	Basic concept & advantage of Three-phase circuit Phasor representation of star & delta connection Measurements of power & power factor in 3-phase system Preparation for final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Introduction to electrical elements, sources, and measuring devices related to electrical circuits.
Week 2 + week3	Generating AC Voltages and Measurement Frequency, Period, Amplitude, and Peak Value.
Week 4	Calculations and Verification of the Impedance of RL series circuits
Weeks 5	Calculations and Verification of the current of RL series circuits
Week 6	Calculations and Verification of Impedance RC series circuits + Calculations and Verification of Current RC series circuits
Weeks 7	Mid-term exam
Week 8	Calculations and verification of the impedance of RLC series circuits
Week 9	Calculations and verification of the current of RLC series circuits
Week 10	Calculations of Power in AC Circuits

Week 11	Calculations and verification of the impedance of RL and RC parallel circuits
Week 12	Calculations and verification of the current of RL and RC parallel circuits
Week 13	Calculations and verification of the impedance RLC parallel circuits
Week 14	Calculations and verification of the impedance current RLC parallel circuits
Week 15	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	Schaum's Outline Series و Electric Circuits Seventh Edition	No
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Mechanics		Module Delivery	
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET 1203			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	UGI	Semester of Delivery		
Administering Department	MIET	College	EETC	
Module Leader	Sara Saad		e-mail	Sara.saad@gmail.com
Module Leader's Acad. Title	Assnt.lect		Module Leader's Qualification	M.sc
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki		e-mail	saad.a.reda@meuc.edu.iq
Scientific Committee Approval Date	8/11/2023		Version Number	.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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A :</u></p> <ol style="list-style-type: none"> 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] <p><u>Part B:</u></p> <ol style="list-style-type: none"> 1- Materials properties, material selective, stress- strain diagram. [5 hrs]

	<p>2- Mechanical tensile test, compression test, impact test, hardness test. [5 hrs]</p> <p>3- Mechanical joint, Rivet joint, welding connection. [5 hrs]</p> <p>4- Beams and bending, Analysis of structure, Centroid, Second moment of area. [7 hrs]</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>Strategies in mechanical subject like:</p> <p>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.</p>

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SSWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	٤٨	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	٣
Unstructured USWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1:	<ul style="list-style-type: none"> Introduction to Engineering Mechanics Basic Concepts and Definitions
Week 2:	Introduction to Statics and Vectors (Part 1) <ul style="list-style-type: none"> Course introduction, syllabus, and importance of Statics.
Week 3:	<ul style="list-style-type: none"> Fundamentals of forces, types of forces. <ul style="list-style-type: none"> Scalars and vectors. Vector addition and subtraction. Vector components and unit vectors.
Week 4:	Introduction to Statics and Vectors (Part 2) <ul style="list-style-type: none"> Resultant of force systems (graphical method). Resultant of force systems (analytical method).
Week 5:	<ul style="list-style-type: none"> Moments of forces (torque). Conditions for equilibrium. Free-body diagrams and solving equilibrium problems.
Week 6:	Stress, Strain, and Material Properties (Part 1) <ul style="list-style-type: none"> Stress and types of stress. Strain and types of strain.
Week 7:	<ul style="list-style-type: none"> Hooke's Law and material properties. <ul style="list-style-type: none"> Stress-strain diagrams. Thermal stress and strain.
Week 8:	Mid-term Exam
Week 9:	Stress, Strain, and Material Properties (Part 2) <ul style="list-style-type: none"> Simple strain and deformation. Stress and strain transformations.
Week 10:	<ul style="list-style-type: none"> Shear and axial deformation. Review and applications of stress and strain. Assignment on stress and strain analysis.
Week 11:	Second Moment of Area and Structural Analysis (Part 1)

	<ul style="list-style-type: none"> • Geometric properties of shapes. • Centroids and center of mass.
Week 12:	<ul style="list-style-type: none"> • Second moment of area (moment of inertia). <ul style="list-style-type: none"> • Bending stress in beams. • Shear stress in beams.
Week 13:	<p>Second Moment of Area and Structural Analysis (Part 2)</p> <ul style="list-style-type: none"> • Shear and moment diagrams. • Introduction to beams and types of loads. • Determining reactions in statically determinate structures. <ul style="list-style-type: none"> • Truss analysis. • Frame analysis.
Week 14:	<p>Friction</p> <ul style="list-style-type: none"> • Friction coefficient • Type of friction • Mechanism of friction. <p>Stress Concentration, Fatigue, and Special Topics</p> <ul style="list-style-type: none"> • Review of special topics. • Comprehensive review of the course material. <ul style="list-style-type: none"> • Final exam or project presentations. <p>Course evaluation and feedback.</p>
Week 15:	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	1- Engineering Mechanic's Statics, 12th Edition by R. C. Nibbler, 1995.	Yes
Recommended Texts	2- Engineering Mechanic's Statics, 7th Edition by James, L. Meriam, L. G Kraige, 1995.	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
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	English Language 1		Module Delivery	
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MTU1002			
ECTS Credits	٢			
SWL (hr/sem)	٥٠			
Module Level	UGI	Semester of Delivery		1
Administering Department	MIET	College	EETC	
Module Leader	Athraa Hani		e-mail	athraa.hani@gmail.com
Module Leader's Acad. Title	Lecturer Assistant	Module Leader's Qualification	MSc.	
Module Tutor			e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki	e-mail	saad.a.reda@meuc.edu.iq	
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

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.

	<p>12. Cultural Competency: Build cultural competence and sensitivity through exposure to diverse texts and discussions about different cultures and lifestyles.</p> <p>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.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>The learning outcomes for English (1) 15-week English class syllabus:</p> <ol style="list-style-type: none"> 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
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Beginners book :</p> <p>Grammar : Possessive (CH1,2,4)</p> <p>Vocabulary – numbers –(CH1, 2, 5) -- the family (Ch4)</p> <p>Every day English-all (Ch1,3)</p> <p>Reading- where are they (Ch2) , The Chairty Walk, (Ch3) , My best Friend,(Ch4) (2 hours)</p> <p>Grammar : Question words (CH 7) – Pronouns (Ch7) – Prepositions (Ch8)</p> <p>Vocabulary – Rooms and Furniture –(CH8) – in and out of Town (Ch4), Saying Years (ch9)</p> <p>Every day English-all (Ch 9)</p>

	<p>Reading- A Postcard from San Fransisco (Ch7) , Vancouver , the best city in the world, (Ch8) , It is a Jacksin Pollock ,(Ch9) (2 hours)</p> <p>Grammar : Present Simple (Ch5,6)- Past Simple (Ch9,10)</p> <p>Vocabulary – shopping, food, in a restaurant (ch12)</p> <p>Every day English-all (Ch 14)</p> <p>Reading- The internet (Ch11) , You are what you eat (Ch12) , This week is different (Ch13) , Life’s big events (Ch14) (2 hours)</p> <p>Pre-intermediate book:</p> <p>Grammar : -</p> <p>Vocabulary – Parts of speech (ch1,3, 7)</p> <p>Every day English-Social expressions (Ch 1)</p> <p>Reading- People the great communicators (Ch1)</p> <p>Writing- A letter to a pen friend (informal) (Ch1) (2 hours)</p> <p>Grammar : - Present continuous – Present simple vs. continuous- have &have got (ch2)</p> <p>Vocabulary –</p> <p>Every day English-Making conversation (Ch 2)</p> <p>Reading- Living in the USA (Ch2)</p> <p>Writing- Linking words (Ch2,3) (2 hours)</p> <p>Grammar : - Past continuous (ch3) – Quantity and Articles (Ch4)</p> <p>Vocabulary –</p> <p>Every day English-</p> <p>Reading- The burglar’s friend – The thief, his mother and 2 billion – Sherlock Holmes the three students (Ch3)</p> <p>Writing- (2 hours)</p> <p>Grammar : - comparative and superlative adj (ch6)</p> <p>Vocabulary – synonyms and antonyms (ch6)</p> <p>Every day English-</p> <p>Reading- Markets around the world(Ch4)</p> <p>Writing- (2 hours)</p> <p>Grammar :</p> <p>Vocabulary:</p> <p>Every day English:</p>
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	<p>Reading- Hollywood Kids (Ch5) – A tale of two millionaires (ch6)</p> <p>Writing- (2 hours)</p> <p>Grammar : Verb Patterns (Ch5) – Future intentions (Ch5)- Present Perfect and Past simple (ch7)</p> <p>Vocabulary:</p> <p>Every day English:</p> <p>Reading:</p> <p>Writing: Relative clauses (ch6,7)..... (2 hours)</p> <p>Grammar : have (got)to, should, must (ch8)</p> <p>Vocabulary: -</p> <p>Every day English: Short Answers (ch7) – At the doctor’s (ch8)</p> <p>Reading- Celebrity interview from Hi (Ch7)</p> <p>Writing- (2 hours)</p> <p>Grammar : Time and conditional clauses (ch9)</p> <p>Vocabulary: -</p> <p>Every day English: In a hotel (ch9)</p> <p>Reading- Problem page (Ch8)</p> <p>Writing- Formal letter (ch8) (2 hours)</p> <p>Grammar :</p> <p>Vocabulary: -</p> <p>Every day English: Exclamation (ch11) – saying goodbye (ch14)</p> <p>Reading- The world’s first megalopolis (Ch9)</p> <p>Writing- writing a review of a book or a film (ch11)..... (2 hours)</p> <p>Grammar :</p> <p>Vocabulary: Phrasal verbs (ch12)- word formation (ch3)</p> <p>Every day English: Social expressions (ch12)</p> <p>Reading- Super volcano (Ch12)</p> <p>Writing- writing a story (ch14)..... (2 hours)</p> <p>Grammar : present perfect continuous (ch13) - Present perfect simple vs continuous (ch13)- Past perfect for clarification (ch14) – Reported statement (ch14)</p> <p>Vocabulary:</p> <p>Every day English:</p>
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	Reading- A funny way to earn a living (Ch13) Writing- (2 hours)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>The learning and teaching strategies for the English Language (Beginner) module may include:</p> <ol style="list-style-type: none"> 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 للطلاب 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

As		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 in the Library?
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 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	Arabic Language		Module Delivery	
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MTU1001			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	UGI	Semester of Delivery		1
Administering Department	MIET	College	EETC	
Module Leader	Ahmed alflahi		e-mail	
Module Leader's Acad. Title	prof	Module Leader's Qualification		PhD
Module Tutor			e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki		e-mail	Saad.a.reda@meuc.edu.iq
Scientific Committee Approval Date	08/11/2023	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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>أهداف المادة الدراسية هي اني يكون الطالب قادراً على أن :</p> <ol style="list-style-type: none"> ١. يتعرف على أنواع الأخطاء اللغوية المشتركة وتوضيح أسبابها وكيفية تجنبها. ٢. يتعلم القواعد المتعلقة بالتاء المربوطة والطويلة والتاء المفتوحة وكيفية كتابتها بشكل صحيح. ٣. يتعلم قواعد كتابة الألف الممدودة والمقصورة واستخدام الحروف الشمسية والقمرية بشكل صحيح. ٤. التعرف على الضاد والطاء ومعرفة كيفية التمييز بينهما في الكتابة. ٥. يتعلم طرق كتابة الهمزة بشكل صحيح وفقاً للقواعد اللغوية. ٦. التعرف على علامات الترقيم واستخدامها بشكل صحيح في النصوص. ٧. يفهم الفروق بين الاسم والفعل والتمييز بينهما في الجمل. ٨. يفهم المفاعيل وكيفية استخدامها بشكل صحيح في النصوص. ٩. يتعلم الأرقام والعدد واستخدامها في التعبير عن الكميات. ١٠. يتجنب الأخطاء اللغوية الشائعة في سياقات عملية لتعزيز فهم القواعد وتحسين المهارات اللغوية. ١١. يدرس النون والتنوين وفهم معاني حروف الجر واستخدامها بشكل صحيح في الجمل. ١٢. يركز على الجوانب الشكلية للخطاب الإداري وكيفية كتابته بأسلوب صحيح ومناسب. ١٣. التعرف على لغة الخطاب الإداري وفهم استخدامها في التواصل الإداري. ١٤. يفهم نماذج من المراسلات الإدارية لتطبيق المفاهيم والمهارات المكتسبة في الخطاب الإداري.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>مخرجات التعلم للمادة الدراسية هي:</p> <ol style="list-style-type: none"> ١. قدرة الطلاب على تحليل وتعريف الأخطاء اللغوية المشتركة وتطبيق القواعد الصحيحة لتجنبها. ٢. القدرة على استخدام القواعد اللغوية المتعلقة بالتاء المربوطة والطويلة والتاء المفتوحة بشكل صحيح. ٣. قدرة الطلاب على استخدام الألف الممدودة والمقصورة بشكل صحيح واستخدام الحروف الشمسية والقمرية بطريقة صحيحة. ٤. تمكين الطلاب من التمييز بين الضاد والطاء وتطبيق القواعد الصحيحة في الكتابة. ٥. القدرة على كتابة الهمزة بشكل صحيح وفقاً للقواعد اللغوية. ٦. استخدام علامات الترقيم بشكل صحيح في النصوص المكتوبة. ٧. فهم الطلاب للفروق بين الاسم والفعل وتمكينهم من استخدامها بشكل صحيح في الجمل. ٨. القدرة على استخدام المفاعيل بشكل صحيح في النصوص المكتوبة. ٩. استخدام الأرقام والعدد بطريقة صحيحة للتعبير عن الكميات. ١٠. التمكن من تطبيق الأخطاء اللغوية الشائعة في سياقات عملية وتصحيحها بشكل مناسب. ١١. فهم استخدام النون والتنوين ومعاني حروف الجر واستخدامها بشكل صحيح في الجمل. ١٢. القدرة على كتابة الخطاب الإداري بأسلوب صحيح ومناسب وفهم لغة الخطاب الإداري. ١٣. تطبيق المفاهيم والمهارات المكتسبة في كتابة المراسلات الإدارية بشكل صحيح وفعال.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>المحتويات الإرشادية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم. ومن بين المحتويات الإرشادية المهمة:</p> <ol style="list-style-type: none"> ١. مقدمة عن الأخطاء اللغوية والتعريف بالتاء المربوطة والتاء المطوَّلة والتاء المفتوحة. (3)

	<p>(ساعات)</p> <p>٢. قواعد كتابة الألف الممدودة والمقصورة والتعرف على الحروف الشمسية والقمرية. (3 ساعات)</p> <p>٣. دراسة الضاد والظاء وتعلم طرق كتابتهما بشكل صحيح. (3 ساعات)</p> <p>٤. تعلم كتابة الهمزة بشكل صحيح وفقاً للقواعد اللغوية. (3 ساعات)</p> <p>٥. دراسة علامات الترقيم وتعلم استخدامها بشكل صحيح في النصوص اللغوية. (3 ساعات)</p> <p>٦. التعرف على الاسم والفعل والتفريق بينهما وفهم القواعد المتعلقة بهما. (3 ساعات)</p> <p>٧. دراسة المفاعيل وتعلم استخدامها في الجمل اللغوية. (3 ساعات)</p> <p>٨. التعرف على الأعداد واستخدامها بشكل صحيح في العبارات والجمل. (3 ساعات)</p> <p>٩. دراسة الأخطاء اللغوية الشائعة وتطبيقاتها في النصوص اللغوية. (3 ساعات)</p> <p>١٠. تعلم استخدام النون والتنوين وفهم معاني حروف الجر واستخدامها بشكل صحيح في الجمل. (2 ساعات)</p> <p>١١. التعرف على الجوانب الشكلية للخطاب الإداري وفهم لغته وقواعده. (2 ساعات)</p> <p>١٢. دراسة نماذج من المراسلات الإدارية وتطبيقها في الكتابة. (2 ساعات)</p> <p>توفر هذه المحتويات الإرشادية للطلاب فهماً شاملاً للمفاهيم اللغوية وتعلم القواعد والتطبيقات العملية التي تساعدهم في تطوير مهاراتهم اللغوية.</p>
<p>Learning and Teaching Strategies</p> <p>استراتيجيات التعلم والتعليم</p>	
Strategies	<p>استراتيجيات التعلم والتعليم المستخدمة في مادة اللغة تشمل مجموعة متنوعة من النهج والتقنيات التي تعزز عملية التعلم للطلاب. من بين هذه الاستراتيجيات:</p> <p>١. التفاعل النشط: يتم تشجيع الطلاب على المشاركة والمشاركة الفعالة في الدروس من خلال المناقشات الجماعية والأنشطة التفاعلية.</p> <p>٢. التعلم التعاوني: يشجع التعاون والتعاون بين الطلاب من خلال العمل الجماعي والمشاريع الجماعية، حيث يتعاون الطلاب مع بعضهم البعض لتحقيق أهداف التعلم المحددة.</p> <p>٣. التطبيق العملي: يتم توفير فرص للطلاب لتطبيق المفاهيم والمهارات المكتسبة في سياقات عملية وواقعية، مما يعزز التفاعل الفعال مع المادة.</p> <p>٤. استخدام التقنيات الحديثة: يستفيد الطلاب من استخدام التكنولوجيا في عملية التعلم، مثل استخدام الحواسيب والإنترنت للبحث والتعلم الذاتي.</p> <p>٥. 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.</p> <p>٦. 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.</p> <p>٧. باستخدام هذه الاستراتيجيات، يتم تعزيز التفاعل والتعلم الفعال للطلاب، و تحفيزهم على المشاركة واكتساب المعرفة والمهارات بشكل شامل وشيق.</p> <p>٨.</p>

Student Workload (SWL)

الحمل الدراسي للطلاب 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

As		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 عشر
	الاستعداد للأمتحان النهائي	الأسبوع الخامس عشر

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

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	MEDICAL CHEMISTRY		Module Delivery	
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET1107			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	UGI	Semester of Delivery		1
Administering Department	MIET	College	EETC	
Module Leader	Noor Najim		e-mail	noor.najim@gmail.com
Module Leader's Acad. Title	Assnt.lect	Module Leader's Qualification	Msc.	
Module Tutor	None		e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki	e-mail	Saad.a.reda@meuc.edu.iq	
Scientific Committee Approval Date	8/11/2023	Version Number	.0١	

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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1- To write and balance chemical equation which many calculations depend on. 2- To convert chemical formula to components composition percent or to conclude empirical formula depending upon composition percent. 3-To predict about the economic pathway for specific reaction to happen depending upon stoichiometric calculations of balanced chemical equations. 4-To Know how to prepare buffers with different ranges of pH using acids with suitable dissociation constant of acid. 5- To understand the effect of common ions on equilibrium of reversible reactions. 6-To focus on theoretical working principles of spectrophotometric instruments. 7- to discuss the importance of isotopes in diseases treatment and diagnosis.
	<p>At ending of course, the student will:</p> <ol style="list-style-type: none"> 1- Able to give chemical compounds their systematic names and to write their chemical formulae. 2- Know how to calculate concentrations of chemicals and to express them in various concentration terms. In addition to convert one term to another. 3- Calculate the compound composition percent according to chemical formula or know empirical formula depending on compounds composition percent. 4- Write chemical equations of different reactions and balance them and predict the limiting reactant in addition to the expected weight of products. 5-Eestimate the reaction direction according to calculation of equilibrium constant of reversible reactions. 6-Know how to prepare buffers and how buffer work? 7- Understand importance and wide application of slightly soluble salts. 8- Perform the statistical treatment of analytical results and source of errors. 9- Recognize the importance of galvanic cells in current generation and role of electrolytic cells in metallic electroplating. 9-Consider zero, 1st and 2nd laws of thermodynamic processes, and evaluate thermodynamic functions of work, enthalpy, heat, internal energy and giving judgment of spontaneous process or not by entropy and Gibbs free energy. 10-List the components of photometric determination techniques, in addition to principals of their works. 11- Identify the photometric instrumentations such as FIS, FT-IR spectrophotometer,

	and mass spectrophotometry. 12- Emphasize the vital role of isotopes in diagnosis and diseases treatment.
Indicative Contents المحتويات الإرشادية	Isotopes, Chemical formula, Units conversion (5 hr) Normality, Formality, Molarity, Molality, Mole fraction, Mill equivalent, ppm, ppb, mass percent, mass/vol percent. (10 hr) Stoichiometry (4 hr) Chemical equilibrium (4 hr) dissociation constant (5 hr) pH (4 hr) Buffers (5 hr) common ion (4 hr) Solubility product constant (4 hr) Statistical treatment, average, range, standard deviation, variance, Absolute error, relative error. (6 hr) Redox reactions, Electrochemistry, electrolytes, Nernst equation, cell potential (6 hr). 1 st law of thermodynamic, Reversible and irreversible process, Heat capacities, adiabatic process, Isothermal processes (6 hr). 2nd law of thermodynamic, entropy, Gibbs free energy (4 hr). Photochemistry, electromagnetic spectrum, Beer Lambert law (6 hr). IR Spectrophotometer, mass spectroscopy, FIS, FES (6 hr). Potentiometer, conductive meter, pH-meter (5 hr).

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Homework assignments, written exam, Quizzes, seminars, reports, practical tests and Online tests

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	75١		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	15min/ 2 times	20% (20)	5 th , 12 th	LO# 1 st – 5 th LO# 10 th – 12 th
	Online Assignments	5min/ 2 times	10% (10)	6 th , 13 th	LO# 1 st LO# 10 th
	Lab.	Each lab/ 5 times	5% (5)	3 rd , 4 th , 5 th , 6 th , 7 th	LO# 1 st - 2 nd , LO# 3 rd LO# 4 th LO# 5 th LO# 6 th – 7 th
	Seminar	10min/ One time	5% (5)	6 th	LO# 2 nd – 5 th
Summative assessment	Midterm Exam	180 min/ one time	10%	8 th	LO# 1 st – 10 th
	Final Exam	240min/ one time	50%	16 th	
Total assessment			100%		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Introduction, Units conversion, Isotopes, Chemical formula and chemical equation
Week 2	Methods of expressing analytical concentrations: Normality, Formality, Molarity, Molality, Mole fraction, Mill equivalent, ppm, ppb, wt. and vol. percent ratio.
Week 3	Stoichiometry
Week 4	Chemical equilibrium
Week 5	Acid-Base dissociation constant
Week 6	pH-scale, buffer solution+ Solubility of precipitations, common ion effect
Week 7	Mid-term Exam
Week 8	Errors & statistical treatment of analytical data sources of errors, types of errors, average mode, range, average derivation, standard deviation, relative standard deviation, variance, method of expressing accuracy, Absolute error, relative error.
Week 9	Redox reactions, balancing of redox equation
Week 10	Electrochemistry: electrochemical cells, types of electrodes, electrolytes, Nernst equation, cell potential
Week 11	Thermodynamic, Zero and first law of thermodynamic, Reversible and irreversible expansion, Heat capacities, adiabatic expansion, Isothermal processes.
Week 12	Second law of thermodynamic: spontaneous processes, entropy and Gibbs free energy.
Week 13	Photochemistry (spectrophotometer analysis), Regions of electromagnetic spectrum, Absorption and emission of electromagnetic spectrum, Beer Lambert law, instrumentations components of spectrophotometer.
Week 14	IR Spectrophotometer, mass spectroscopy, flame ionization spectrophotometry.
Week 15	Potentiometer, conductive meter, pH-meter and some other applications of chemical sensors+ Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Principals of qualitative analysis.
Week 2	Qualitative analysis of cations of 1 st and 2 nd groups.
Week 3	Qualitative analysis of cations of 3 rd and fifth groups.
Week 4	Introduction to Quantitative (volumetric) analysis and types of standard substance in titration, principles and calculations of titration.
Week 5	How to prepare solution of primary standard materials and to standardize secondary standard substance of HCl, (acid-base titration)
Week 6	Standardization secondary standard substance of NaOH and its application by determination of vinegar acidity.
Week 7	Determination of residual chloride in tape water by titration against silver nitrate (precipitation titration).

Learning and Teaching Resources

مصادر التعلم والتدريس

Required Texts		
Recommended Texts	<p>1- ESSENTIALS OF GENERAL CHEMISTRY By EBBING GABBON RAGSDALE</p> <p>2- CHEMICAL PRINCIPLES By Steven S Zumdahl - 4th edition</p>	No
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Workshops		Module Delivery
Module Type	Support		<input type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	EETC1001		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGI	Semester of Delivery	2
Administering Department	MIET	College	EETC
Module Leader	Huda Farooq Jameel	e-mail	huda_baban@mtu.edu.iq
Module Leader's Acad. Title	Assist. lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Mayss alreem Nizar hammed	e-mail	Mayssalreem92@mtu.edu.iq
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki	e-mail	saad.a.reda@meuc.edu.iq
Scientific Committee Approval Date	8/11/2023	Version Number	.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 (such as 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	<p>Indicative content includes the following:</p> <p>Lathe workshop, measuring devices, different tools, cutting tools, welding, gas welding, and point welding. [7 hrs.].</p> <p>Electrical transformers, magnetic circuit, and electrical circuits. [6 hrs.].</p> <p>Different measuring devices in the workshop (such as an ovometer, oscilloscope, power supply, etc.) [8 hrs.].</p> <p>Soldering iron and printed electronic circuits [4 hrs.].</p> <p>Coils, capacitors, and resistors [6 hrs.].</p> <p>Switches and fuses [4 hrs.].</p> <p>Semiconductor diode, and transistor [6 hrs.].</p> <p>Electronic map, faults on the electronic map, and design electronic circuits on the printed board [8 hrs.].</p> <p>Implemented a simple electronic circuit on the printed board [4 hrs.].</p> <p>Integrated electronic circuits [4 hrs.].</p>

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) 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					
As		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	
Week	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

	<p>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.</p> <p>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.</p>
Week 8	Midterm- Exam
Week 9	<p>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</p>
Week 10	<p>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.</p>
Week 11	<p>Lab 11: Types of semiconductor diodes and transistors and finding the equivalents. Semiconductor check, diode check, transistor check</p>
Week 12	<p>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.</p>
Week 13	<p>Lab 13: How to install and solder electronic components on the printed board. Implementation of a simple electronic circuit on the printed board.</p>
Week 14	<p>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.</p>
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 (Charles Platt).	NO
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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Medical physics		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial Practical <input type="checkbox"/> Seminar <input type="checkbox"/>
Module Code	MIET1202		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG1	Semester of Delivery	2
Administering Department	MIET	College	EETC
Module Leader	Noor Najim	e-mail	Noor.najim@gmail.com
Module Leader's Acad. Title	Assist. lecturer	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki	e-mail	saad.a.reda@meuc.edu.iq
Scientific Committee Approval Date	8/11/2023	Version Number	.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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>1- to recognize the influence of forces on the human body Identify how the skeleton works</p> <p>2- to show how pressure affects the body's organs Recognize physical activity of the lungs and breathing</p> <p>3- to demonstrate the physics of the cardiovascular system and the urinary system</p> <p>4- to distinguishes the basic principles using the applications of electricity and magnetism in medicine</p> <p>5- to shall be acquainted with respiratory, cardiovascular and cardiovascular equipment</p> <p>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</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Upon completion of the course, students should be able to:</p> <p>1- Understand the difference between the Forces.</p> <p>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</p> <p>3- know methods of diathermy</p> <p>4- understand how Energy change in the body</p> <p>5- know pressures inside the body parts and measure it</p> <p>6- understand how to work the lungs and How the blood and lungs interact</p> <p>7- know nervous system and the neuron</p> <p>8- know the graphing devices of the body organs</p> <p>9- know the applications of Electricity and Magnetism in Medicine</p> <p>10- know the application of sound in medicine, know sonar devices</p> <p>11- know the application of light and laser in medicine</p> <p>12- know Major components of the cardiovascular system</p> <p>13- know physics of nuclear medicine</p> <p>14- know the x- ray device</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>1- Define the Forces , Frictional Forces , Dynamics (5hrs)</p> <p>2- functions of the skeleton and Bone consists of quite different materials and how to measure mineral in the bones (5 hrs)</p> <p>3- Types of thermometers , Heat therapy, Cryogenics (5 hrs)</p> <p>4- Sphygmomanometer, blood pressure, bladder pressure , tonometer(4hrs)</p> <p>5- Function of Lungs & Breathing, breath rate, airways, Dalton's law of partial pressures(3hrs)</p> <p>6- The nervous system and the neuron, Electrocardiogram, Electro retion gram (ERG), The magneto cardiogram (MCG)(4hrs)</p>

	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)
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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)		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					
As		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 الاسبوعي النظري

Week	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

Week	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 errors
	C - Good	جيد	70 - 79	Sound work with notable errors
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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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Programming and Applications I		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MIET1206		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Laheeb Nidhal	e-mail	Laheep.nidhal@gmail.com
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc
Module Tutor		e-mail	
Peer Reviewer Name	Dr. Aws Alazawi	e-mail	aws_basil@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	Version Number	٠١

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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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. 								
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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, Elseif, 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. 12. Train of GUI Interface (Attaching buttons to actions, Getting Input, Setting Output). 								
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<table border="0"> <tr> <td>Window, Workspace Window, Command History window, Help Window, Editor Window. (3 hr)</td> <td>1.</td> </tr> <tr> <td>Constants, Entering Matrices, Useful Matrix Generators, Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns. (5 hr)</td> <td>2.</td> </tr> <tr> <td>variables and assignment statement, logical operator. (5 hr)</td> <td>3.</td> </tr> <tr> <td>sum, max, min, mean, magic, diag, length, size, median, prod, sort. (2 hr)</td> <td>4.</td> </tr> </table>	Window, Workspace Window, Command History window, Help Window, Editor Window. (3 hr)	1.	Constants, Entering Matrices, Useful Matrix Generators, Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns. (5 hr)	2.	variables and assignment statement, logical operator. (5 hr)	3.	sum, max, min, mean, magic, diag, length, size, median, prod, sort. (2 hr)	4.
Window, Workspace Window, Command History window, Help Window, Editor Window. (3 hr)	1.								
Constants, Entering Matrices, Useful Matrix Generators, Subscripting, End as a subscript, Colon Operator, Transpose Deleting Rows or Columns. (5 hr)	2.								
variables and assignment statement, logical operator. (5 hr)	3.								
sum, max, min, mean, magic, diag, length, size, median, prod, sort. (2 hr)	4.								

	Multiple Data Sets in One Graph, Specifying Line Styles and Colors, Multiple Plots in One Figure, Setting Axis Limits. (2 hr)	5.
	M-file, input-output statement. (2 hr)	6.
	Conditional statements: If, Else, Elseif, switch case. (3 hr)	7.
	While statement, For statement. (4 hr)	8.
	conditional and repetition statements. (4 hr)	9.
	accustom-made MATLAB function. (4 hr)	10.
	GUI. (4 hr)	11.
	GUI attaching buttons to actions, Getting Input, Setting Output. (4 hr)	12.

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 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					
As		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 الاسبوعي النظري	
Week	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

Week	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
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 (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Engineering Drawing		Module Delivery	
Module Type	Support		<input type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	EETC102			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGI	Semester of Delivery		1
Administering Department	MIET	College	EETC	
Module Leader	Suha Sabeeh Ahmed		e-mail	suhasabeh@mtu.edu.iq
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	M.Sc.
Module Tutor			e-mail	
Peer Reviewer Name	Prof. Dr. Abbas Sheyaa Alwan		e-mail	Abbas_sheyaa@mtu.edu.iq
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

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

	<p>8. The student will demonstrate the ability to output drawings in AutoCAD.</p> <p>9. Drawing 3d modeling.</p> <p>10. Drawing the Exercises.</p>
Indicative Contents	<p>Indicative content includes the following.</p> <p>Basic Drawing & Editing Commands</p> <ul style="list-style-type: none"> • Drawing Lines • Erasing Objects • Drawing Lines with Polar Tracking • Drawing Rectangles • Drawing Circles • Undo and Redo Actions <p>hrs.] Ȳ • [</p> <p>Making Changes in Your Drawing</p> <ul style="list-style-type: none"> • Selecting Objects for Editing • Moving Objects • Copying Objects • Rotating Objects • Scaling Objects • Mirroring Objects • Editing with Grips <p>[4 hrs.]</p> <p>Display Control</p> <ul style="list-style-type: none"> • Zoom • Pan • Redraw • Clean Screen. <p>[4 hrs.]</p> <p>Adding Dimensions</p> <ul style="list-style-type: none"> •Dimensioning Concepts •Adding Linear Dimensions •Adding Radial and Angular Dimensions •Editing Dimensions <p>[4 hrs.]</p> <p>Hatching</p> <ul style="list-style-type: none"> •Hatching •Editing Hatches <p>[4hrs]</p> <p>Printing Your Drawing</p> <ul style="list-style-type: none"> •Printing Layouts <p>•Print and Plot Settings [4 hrs.]</p> <p>3D MODELLING, Convert 2D to 3D, Solid Editing [19 hrs.]</p>

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 in 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.

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					
As		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 assignment	4	1% (1)	4, 5, 10, 11	LO # 3-9
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	
Week	Material Covered
Week 1	Introduction to Autodesk AutoCAD <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Drawing Lines Erasing Objects Drawing Lines with Polar Tracking

	<ul style="list-style-type: none"> • Drawing Rectangles • Drawing Circles • Undo and Redo Actions
Week 3	Projects - Creating a Simple Drawing <ul style="list-style-type: none"> • Create a Simple Drawing • Create Simple Shapes
Week 4	Drawing Precision in AutoCAD <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Selecting Objects for Editing • Moving Objects • Copying Objects • Rotating Objects • Scaling Objects • Mirroring Objects • Editing with Grips
Week 6	Advanced Object Types <ul style="list-style-type: none"> • Drawing Arcs • Drawing Polylines • Editing Polylines • Drawing Polygons • Drawing Ellipses
Week 7	Advanced Editing Commands <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Dimensioning Concepts • Adding Linear Dimensions • Adding Radial and Angular Dimensions

	<ul style="list-style-type: none"> •Editing Dimensions Text <ul style="list-style-type: none"> •Working with Annotations •Adding Text in a Drawing •Modifying Multiline Text •Formatting Multiline Text •Adding Notes with Leaders to Your Drawing
Week 10	Hatching <ul style="list-style-type: none"> •Hatching •Editing Hatches
Week 11	3D modeling
Week 12	Convert 2D To 3D.
Week 13	Exercises drawing
Week 14	Printing Your Drawing <ul style="list-style-type: none"> •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

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	Democracy and Human Rights		Module Delivery	
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> 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	Aya hassan		e-mail	aya.hassam@gmail.com
Module Leader's Acad. Title	Assistant Lecturer		Module Leader's Qualification	M.Sc
Module Tutor			e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki		e-mail	Saad.a.reda@meuc.edu.iq
Scientific Committee Approval Date	/2023\8/1		Version Number	.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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>١. التطور التاريخي لحقوق الإنسان:</p> <p>دراسة التطور التاريخي لفهم حقوق الإنسان من الحضارات القديمة إلى العصور الحديثة.</p> <p>٢. حقوق الإنسان في الشرائع السماوية:</p> <p>التركيز على حقوق الإنسان في الإسلام وكيف تم تضمينها في الشريعة الإسلامية.</p> <p>٣. اعتراف إقليمي بحقوق الإنسان:</p> <p>فحص اعتراف الأقاليم الأوروبي، الأمريكي، الإفريقي، الإسلامي، والعربي بحقوق الإنسان.</p> <p>٤. دور المنظمات غير الحكومية:</p> <p>دراسة دور المنظمات مثل اللجنة الدولية للصليب الأحمر ومنظمة العفو الدولية في حماية حقوق الإنسان.</p> <p>٥. الإطار القانوني الدولي والإقليمي:</p> <p>التركيز على المواثيق الدولية والإقليمية، مثل الإعلان العالمي لحقوق الإنسان.</p> <p>٦. تحليل حقوق الإنسان في التشريعات الوطنية:</p> <p>دراسة كيفية ترجمة حقوق الإنسان في التشريعات الوطنية، مع التركيز على الدستور العراقي.</p> <p>٧. تصنيف حقوق الإنسان وضماناتها:</p> <p>فهم مختلف أشكال حقوق الإنسان والضمانات الدستورية والقضائية والسياسية لحمايتها.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>١. القدرة على وصف وتحليل التطور التاريخي لحقوق الإنسان منذ الحضارات القديمة حتى العصور الحديثة.</p> <p>٢. القدرة على فحص حقوق الإنسان في حضارة وادي الرافدين وغيرها لفهم التأثير الثقافي على تطورها.</p> <p>٣. تفسير حقوق الإنسان في الإسلام وفهم كيف تم تضمينها في الشريعة الإسلامية.</p> <p>٤. القدرة على تحليل تطور حقوق الإنسان خلال العصور الوسطى والحديثة.</p> <p>٥. الفهم الشامل لاعتراف الأقاليم الأوروبي، الأمريكي، الإفريقي، الإسلامي، والعرب بحقوق الإنسان.</p> <p>٦. القدرة على تقييم دور منظمات مثل اللجنة الدولية للصليب الأحمر ومنظمة العفو الدولية في حماية حقوق الإنسان.</p> <p>٧. القدرة على دراسة وتحليل المواثيق الدولية والإقليمية، بما في ذلك الإعلان العالمي لحقوق الإنسان.</p> <p>٨. القدرة على فحص كيف تم ترجمة حقوق الإنسان في التشريعات الوطنية، مع التركيز على مثال الدستور العراقي.</p> <p>٩. القدرة على تصنيف حقوق الإنسان إلى أشكال فردية وجماعية، وأجيال مثل الحقوق المدنية والسياسية والاقتصادية والاجتماعية.</p> <p>١٠. القدرة على تحليل الضمانات الدستورية والقضائية والسياسية لحقوق الإنسان على الصعيدين الوطني والدولي والإقليمي.</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>فهم التاريخ التطوري لحقوق الإنسان (٣ س)</p> <p>تحليل حقوق الإنسان في الحضارات القديمة (٣ س)</p> <p>فهم حقوق الإنسان في الشرائع السماوية (٣ س)</p> <p>تحليل حقوق الإنسان في العصور الوسطى والحديثة (٣ س)</p> <p>فهم الاعتراف الإقليمي بحقوق الإنسان (٣ س)</p> <p>تقدير دور المنظمات غير الحكومية (٣ س)</p>

	<p>فهم الإطار القانوني لحقوق الإنسان (٣ س)</p> <p>تحليل حقوق الإنسان في التشريعات الوطنية (٣ س)</p> <p>فهم أشكال وأجيال حقوق الإنسان (٣ س)</p> <p>تحليل ضمانات حقوق الإنسان (٣ س)</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>تشجيع الطلاب على المشاركة في مناقشات تفاعلية حول تطور حقوق الإنسان عبر التاريخ.</p> <p>مشروعات بحثية:</p> <p>توجيه الطلاب في إعداد مشروعات بحثية تستكشف تطور حقوق الإنسان في فترات تاريخية محددة.</p> <p>استخدام التكنولوجيا:</p> <p>تضمين وسائل تكنولوجية لتعزيز تفاعل الطلاب وتقديم المعلومات بشكل أكثر تفاعلية.</p> <p>ورش العمل والتمثيل العملي:</p> <p>إجراء ورش عمل تفاعلية وأنشطة تمثيل لفهم أعمق لمفاهيم حقوق الإنسان.</p> <p>تقديم تقييم مستمر:</p> <p>تقديم تقييم مستمر لفحص تقدم الطلاب وفهمهم لتطور حقوق الإنسان على مر العصور.</p>

Student Workload (SWL) الحمل الدراسي للطلاب			
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					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 9	6, 7 LO #1, 2, 3, LO #
	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)

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

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<p>١. "حقوق الإنسان في العالم العربي: القضايا والتحديات"، تأليف: علي حجازي وجمال شعت. الطبعة: الطبعة الثانية، العام: ٢٠١٧.</p> <p>"مبادئ حقوق الإنسان: المفاهيم والقضايا الحديثة"، تأليف: أحمد المجالي وغان حمدان. الطبعة: الطبعة الأولى، العام: ٢٠١٩.</p>	Yes
Recommended Texts	<p>١. "حقوق الإنسان والديمقراطية"، تأليف: مصطفى كامل محمود. الطبعة: الطبعة الأولى، العام: ٢٠١٥.</p> <p>٢. "تاريخ حقوق الإنسان في العصور القديمة والوسطى"، تأليف: نبيل رزق. الطبعة: الطبعة الثالثة، العام: ٢٠١٢.</p> <p>٣. "حقوق الإنسان في العراق: الواقع والتحديات"، تأليف: سعد الله عباس. الطبعة: الطبعة الأولى، العام: ٢٠١٤.</p> <p>٤. "حقوق الإنسان في العراق: المفهوم والتطور"، تأليف: عبد الكريم السامرائي. الطبعة: الطبعة الأولى، العام: ٢٠١٨.</p> <p>"حقوق الإنسان في العراق: بين التحديات والآفاق"، تأليف: محمد السامرائي ولقاء الحربي. الطبعة: الطبعة الأولى، العام: ٢٠٢٠.</p>	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
<p>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.</p>				

المرحلة الثانية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Laboratory Medical Instrumentation I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	MIET2101		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UGII	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Essam alhusaini	e-mail	essam.falih@gmail.com
Module Leader's Acad. Title	Assnt.Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	None	e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki	e-mail	saad.a.reda@meuc.edu.iq
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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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 action of medical devices. 5. Prepare application engineers in technical and electronic engineering. 6. Put the proposals and alternatives for the medical devices.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Upon completion of the course, students should be able to:</p> <ol style="list-style-type: none"> 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.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following:</p> <p>Medical instrumentation classification, analysis lists, work security rules, and best laboratory use guidelines [14 hr].</p> <p>Calibration of instruments criteria, types, components, advantages and disadvantages, physical and medical applications. [14hr]</p> <p>Medical instrumentation faults and maintenance, analysis lists, work security rules, and best laboratory use guidelines [14hr].</p> <p>Patient safety and hospital design rules [15h].</p> <p>Classification of different types of medical laboratories like medical, biological histological and chemical [13hr].</p>

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.
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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	٥
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	(1 %)	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	
Week	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	
Week	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
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	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.				

Electronic Circuits I

Module Information					
معلومات المادة الدراسية					
Module Title	Electronic Circuits I		Module Delivery		
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar		
Module Code	MIET2102				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGII	Semester of Delivery		3
Administering Department		MIET	College	EETC	
Module Leader	Ali Ghazi		e-mail	Ali7new@mtu.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		M.Sc.
Module Tutor			e-mail		
Peer Reviewer Name	Prof. Dr. Ahmed R. Ajel		e-mail	Dr_ahmed.r@mtu.edu.iq	
Scientific Committee Approval Date	8/11/2023		Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Fundamentals 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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. The graduate gets 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 engineering. 6. Put the proposals and alternatives for the electronic devices.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Become aware of the general characteristics of electronic devices. 2. Be able to describe the difference types of electronic categories. 3. Develop a clear understanding of the basic operation and characteristics of electronic devices. 4. Become familiar with the use of equivalent circuits to analyze series, parallel, and series-parallel electronic networks. 5. Be able to predict the output response of an electronic networks. 6. Become familiar with the analysis of and the range of applications for electronic devices. 7. Become familiar with the basic construction and operation of the various types of electronic categories. 8. Be able to test a various type of electronic terminals. 9. Be able to determine the dc levels for the variety of important electronic circuits. 10. Understand how to measure the important voltage levels of electronic circuits. 11. Begin to understand the troubleshooting process as applied to electronic configurations. 12. Develop a sense for the stability factors of an electronic circuits. 13. Learn to use the equivalent model to find the important ac parameters for an amplifier. 14. Develop some skill in troubleshooting ac amplifier networks.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A Electronic Theory</u></p> <p>Semiconductor Materials: Ge, Si, and GaAs 2, Covalent Bonding and Intrinsic Materials, n -Type and p -Type Materials , Semiconductor Diode , Transistor Construction ,Transistor Operation , Construction and Characteristics of JFETs ,Transfer Characteristics, Important Relationships ,Depletion-Type MOSFET</p>

	Enhancement-Type MOSFET [10 hrs]
	Diode Applications -Load-Line Analysis, Series Diode Configurations, Parallel and Series–Parallel Configurations, Sinusoidal Inputs; Half-Wave Rectification Full-Wave Rectification , Clippers , Clampers Networks with a dc and ac Source, Zener Diodes , Voltage-Multiplier Circuits [12 hrs]
	Revision problem classes [6 hrs]
	<u>Part B - DC Electronic Circuits</u>
	BJT Transistor - Operating Point, dc bias configurations of a BJT transistor, Miscellaneous Bias Configurations of a BJT transistor 4.11 Design Operations of a BJT transistor, Multiple BJT Networks, Current Mirrors. [13 hrs]
	FET Transistor - biasing arrangements for the n and p channel JFET, 7.7 Depletion-Type MOSFETs, Enhancement-Type MOSFETs, Combination Networks, Universal JFET Bias, Practical Applications. [10 hrs]
	<u>Part C - AC Electronic Circuits</u>
	BJT Transistor - Amplification in the AC Domain, BJT Transistor Modeling, the r_e Transistor Model, Effect of R_L and R_s , Determining the Current Gain, Cascaded Systems, Darlington Connection, Feedback Pair, The Hybrid Equivalent Model. [17 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy 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 encourages 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) 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		

Module Evaluation تقييم المادة الدراسية					
As		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) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction -
Week 2	Semiconductors materials
Week 3	Diode Configurations
Week 4	Diode Networks with a dc and ac Source
Week 5	Zener Diodes
Week 6	Bipolar junction transistor
Week 7	Mid-term Exam
Week 8	DC biasing BJTs
Week 9	Multiple BJT Networks
Week 10	Field effect transistor and MOSFET
Week 11	Depletion-Type MOSFET

Week 12	Enhancement type MOSFET
Week 13	BJT AC Analysis
Week 14	BJT Transistor Modeling and Effect of RL and Rs
Week 15	Preparatory week before final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab 1: Diode characteristics
Week 2	Lab 2: Half – wave Rectifier
Week 3	Lab 3: full wave Rectifier
Week 4	Lab 4: Filter for Halve – wave and full wave Rectifiers
Week 5	Lab 5: Voltage Doubler
Week 6	Lab 6: Voltage Tripler
Week 7	Lab 7: Positive Series Clipper
Week 8	Lab 8: Negative Series Clipper
Week 9	Lab 9: positive parallel Clipper
Week 10	Lab 10: Negative parallel Clipper
Week 11	Lab 11: Clamper
Week 12	Lab12: Zener Diode
Week 13	Lab13: Fixed Vi , Variable RL Zener Diode
Week 14	Lab14: Fixed RL , Variable Vi Zener Diode

Learning and Teaching Resources

مصادر التعلم والتدريس

	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/electrical-engineering	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Electrical Machines		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> 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	Ali Amer Ahmed		e-mail	Ali.amer@gmail.com
Module Leader's Acad. Title	Lect.	Module Leader's Qualification	pHD	
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki		e-mail	Saa.a.reda@mecu.edu.iq
Scientific Committee Approval Date	8/11/2023		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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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 devices and 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	<p>Indicative content includes the following.</p> <p>Part A - Single-phase electrical transformers</p> <p>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]</p> <p>Part B - Three-phase electrical transformers</p> <p>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]</p> <p>Part C-</p> <p>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]</p> <p>Part D-</p> <p>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]</p> <p>Part E-</p> <p>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]</p> <p>Instantaneous power and average power of alternating current, relative and apparent power.</p> <p>Types of electric motors and how they work [5 hours]</p> <p>Review problem categories [6 hours]</p>

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in the exercises, while improving and expanding their critical 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.</p>

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		

Module Evaluation تقييم المادة الدراسية					
As		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

Week	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 type motor , etc
Week 15	Preparatory week before final exam

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Engineering Mathematics		Module Delivery	
Module Type	Support		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET2104			
ECTS Credits	٤			
SWL (hr/sem)	١٠٠			
Module Level	UGII	Semester of Delivery		3
Administering Department	MIET	College	EETC	
Module Leader	Awss Jabbar Majeed		e-mail	awss_alogaidi@mtu.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki		e-mail	Saad.a.reda@mecu.edu.iq
Scientific Committee Approval Date	8/11/2023	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

<p>Module Objectives</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. The goal of this module is to give students the necessary mathematical skills 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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 n th order. Integral Transforms: Fourier series and Laplace transform. [25 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 أسبوعاً

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	37	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
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					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 and #5 - #8
	Report	1	10% (10)	14	LO #1- #6 and #7 - #12
	OnSite assignment	2	5% (10)	5 and 14	LO #1- #5 and #6- #12
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)

المنهاج 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?
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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.				

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			<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET2105				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII		Semester of Delivery	
Administering Department		MIET		College	
Module Leader		Noor Najim		e-mail	
Module Leader's Acad. Title		Assnt.lect.		Module Leader's Qualification	
Module Tutor				e-mail	
Peer Reviewer Name		Assnt.Prof.Dr./Saad A. Makki		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			Semester

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>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.</p> <p>2- This mode unit consists of main elements of anatomy and physiology, the terminology used, and how our body control itself.</p> <p>3- Students will be able to understand how medical device work with the human body and what the benefit from it.</p> <p>4- To understand the level of organization of the human organism and the homeostatic system.</p> <p>5- To understand the chemical structure, chemical reactions and their control with acid-base balance in human body.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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, organs and systems of the human body with their normal functions, and identify the changes that occur during human development, ageing and disease.
<p>Indicative Contents</p>	<p>Topics include:</p>

المحتويات الإرشادية	<ul style="list-style-type: none"> • 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]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>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:</p> <p style="text-align: right;"><u>Teaching methods include:</u></p> <ul style="list-style-type: none"> • lectures • seminars • tutorials • lab experiments • design assignments. • industrial visits • professional training • a variety of projects <p style="text-align: right;">Assessment : methods of assessment include a combination of:</p> <ul style="list-style-type: none"> • 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 أسبوعيا	4
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					
As		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 الاسبوعي النظري	
Week	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	
Week	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 Francisco, 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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer applications		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MTU1005		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII 2	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name	Ahmed J. Abid	e-mail	dr.ahmedjabbar@mtu.edu.iq
Scientific Committee Approval Date	08/11/2023	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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>The module aims to:</p> <ol style="list-style-type: none">1. To provide an overview of Microsoft Word, Excel, and PowerPoint, and familiarize students with their key features and user interfaces.2. To develop essential skills in creating, saving, and opening documents in Microsoft Word, including formatting text and paragraphs and working with styles and themes.3. To explore advanced features in Microsoft Word, such as page layout options, working with headers, footers, and page numbers, and incorporating tables, images, and objects.4. To introduce spreadsheets and worksheets in Microsoft Excel, and develop students' skills in data entry, manipulation, and basic formulas and functions.5. To delve into advanced Microsoft Excel features, including working with ranges and cells, sorting and filtering data, and creating charts and graphs.6. To guide students in creating and editing slides in Microsoft PowerPoint, applying themes and templates, and adding text, images, and multimedia elements.7. To explore advanced PowerPoint features, such as slide transitions, animations, using SmartArt and shapes, and utilizing presenter tools and slide show options.8. To teach word processing techniques in Microsoft Word, such as mail merge, document collaboration, creating professional documents, and managing references and citations.9. To provide advanced data analysis skills in Microsoft Excel, covering advanced formulas and functions, data validation, conditional formatting, and PivotTables.10. To explore collaboration and sharing features in Microsoft Office, including sharing and co-authoring documents, using comments and track changes, and protecting documents.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1. Demonstrate a solid understanding of Microsoft Word, Excel, and PowerPoint, including their key features, user interfaces, and common functions.2. Create, format, and manage documents effectively in Microsoft Word, utilizing styles, themes, page layout options, headers, footers, tables, images, and objects.3. Utilize Microsoft Excel for data entry, manipulation, basic calculations using formulas and functions, sorting and filtering data, and creating charts and graphs.4. Develop proficiency in creating and editing slides, applying themes, templates, and multimedia elements, and utilizing advanced features in Microsoft PowerPoint.5. Employ word processing techniques in Microsoft Word, including mail merge, document collaboration, creating professional documents, and managing references and citations.6. Apply advanced data analysis skills in Microsoft Excel, including advanced formulas and functions, data validation, conditional formatting, and PivotTables.

	<ol style="list-style-type: none"> Collaborate and share documents effectively using Microsoft Office features, such as sharing and co-authoring, comments and track changes, and document protection. Automate tasks in Word, Excel, and PowerPoint using macros, customizing the ribbon, creating shortcuts, and integrating data between applications for enhanced productivity and efficiency.
Indicative Contents المحتويات الإرشادية	<p>The indicative contents for the Computer Application module may include:</p> <ol style="list-style-type: none"> Introduction to Microsoft Office Suite: [8 hrs.] Microsoft Word Basics: [8 hrs.] Advanced Microsoft Word Features: [8 hrs.] Microsoft Excel Basics: [8 hrs.] Advanced Microsoft Excel Features: [8 hrs.] Microsoft PowerPoint Basics: [8 hrs.] Advanced Microsoft PowerPoint Features: [8 hrs.] Word Processing Techniques in Microsoft Word: [8 hrs.] Data Analysis in Microsoft Excel: [8 hrs.] Presentation Design in Microsoft PowerPoint: [8 hrs.] Collaboration and sharing in Microsoft Office: [8 hrs.] Automating Tasks in Microsoft Office: [8 hrs.] Integrating Office Applications: [8 hrs.] Advanced Tips and Tricks: [8 hrs.] Final Projects and Review: [8 hrs.]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>The learning and teaching strategies employed in the applied mathematics module are designed to facilitate active engagement, critical thinking, and practical application of mathematical concepts. The following strategies are commonly used:</p> <ol style="list-style-type: none"> Lectures: Lectures serve as the primary mode of content delivery, where instructors present key concepts, theories, and techniques. Lectures may include visual aids, examples, and demonstrations to enhance understanding and provide real-world context. Interactive Discussions: Interactive discussions encourage student participation and facilitate deeper understanding of the material. Students are encouraged to ask questions, share their insights, and engage in discussions on specific topics or problem-solving strategies. Problem-solving Sessions: Problem-solving sessions allow students to apply mathematical principles to solve a variety of problems. These sessions may be conducted in groups or individually, allowing students to collaborate, exchange ideas, and develop problem-solving skills. Practical Exercises: Practical exercises involve hands-on application of mathematical concepts through computational tasks, modeling exercises, or simulations. These exercises reinforce theoretical knowledge and help students develop proficiency in using mathematical tools and software. Case Studies and Real-world Applications: Case studies and real-world applications demonstrate the relevance of mathematics in various fields. Students analyze and solve mathematical problems based on real-life scenarios, enabling them to connect theoretical concepts with practical applications.

	<p>6. Computer-based Learning: Computer-based learning resources, such as online tutorials, interactive simulations, and mathematical software, are utilized to enhance students' understanding and proficiency in applying mathematical techniques.</p> <p>7. Group Projects: Group projects promote teamwork, communication, and problem-solving skills. Students work collaboratively on mathematical projects or research assignments, allowing them to explore advanced topics or applications of mathematics.</p> <p>8. Self-directed Learning: Students are encouraged to take responsibility for their learning by engaging in self-directed study. This may involve reading recommended textbooks, exploring additional resources, and practicing problem-solving independently.</p> <p>9. Assessments: Regular assessments, including quizzes, tests, and assignments, evaluate students' understanding and application of mathematical concepts. These assessments provide feedback and help track progress throughout the module.</p> <p>10. Tutorial Sessions: Tutorial sessions provide opportunities for students to seek clarification, discuss challenging topics, and receive individualized guidance from instructors or teaching assistants.</p>
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Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	٤٩	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	٣
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	٢٦	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	١
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	٧٥		

Module Evaluation					
تقييم المادة الدراسية					
As		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.	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)	
Week	Material Covered

Week 1	Introduction to Microsoft Office Suite <ul style="list-style-type: none"> • Overview of Microsoft Word, Excel, and PowerPoint • Understanding the user interface and common features
Week 2	Microsoft Word Basics <ul style="list-style-type: none"> • Creating, saving, and opening documents • Formatting text and paragraphs • Working with styles and themes
Week 3	Advanced Microsoft Word Features <ul style="list-style-type: none"> • Page layout and formatting options • Working with headers, footers, and page numbers • Using tables, images, and other objects
Week 4	Microsoft Excel Basics <ul style="list-style-type: none"> • Introduction to spreadsheets and worksheets • Data entry and manipulation • Formulas and functions
Week 5	Advanced Microsoft Excel Features <ul style="list-style-type: none"> • Working with ranges and cells • Sorting and filtering data • Creating charts and graphs
Week 6	Microsoft PowerPoint Basics <ul style="list-style-type: none"> • Creating and editing slides • Applying themes and templates • Adding text, images, and multimedia elements
Week 7	Mid Exam + Advanced Microsoft PowerPoint Features <ul style="list-style-type: none"> • Slide transitions and animations • Using SmartArt and shapes • Presenter tools and slide show options
Week 8	Word Processing Techniques in Microsoft Word <ul style="list-style-type: none"> • Mail merge and document collaboration • Creating professional documents (reports, resumes, etc.) • Managing references and citations
Week 9	Data Analysis in Microsoft Excel <ul style="list-style-type: none"> • Advanced formulas and functions • Data validation and conditional formatting • PivotTables and data visualization
Week 10	Presentation Design in Microsoft PowerPoint <ul style="list-style-type: none"> • Design principles for effective presentations • Customizing slide layouts and master slides • Adding interactive elements (hyperlinks, buttons, etc.)
Week 11	Collaboration and Sharing in Microsoft Office <ul style="list-style-type: none"> • Sharing and co-authoring documents • Using comments and track changes • Protecting documents and controlling access
Week 12	Automating Tasks in Microsoft Office <ul style="list-style-type: none"> • Macros and automation in Word, Excel, and PowerPoint • Customizing the ribbon and creating shortcuts • Using add-ins and productivity tools
Week 13	Integrating Office Applications <ul style="list-style-type: none"> • Linking data between Word, Excel, and PowerPoint • Embedding objects and creating dynamic content • Importing and exporting data

Week 14	Advanced Tips and Tricks <ul style="list-style-type: none"> • Time-saving techniques and shortcuts • Troubleshooting common issues • Customizing settings and options
Week 15	Final Projects and Review <ul style="list-style-type: none"> • Students work on individual or group projects using Word, Excel, and PowerPoint • Review of key concepts and features covered throughout the course
Week 16	Preparatory week before the final Exam.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	<ul style="list-style-type: none"> • Introduction to Lab Environment and Office Suite - Lab setup and software installation. Overview of Microsoft Office Suite tools and features.
Week 2	<ul style="list-style-type: none"> • Microsoft Word Lab - Creating, editing, and formatting documents. Inserting and formatting images and tables.
Week 3	<ul style="list-style-type: none"> • Microsoft Excel Lab - Creating spreadsheets and entering data. Formulas and functions for calculations.
Week 4	<ul style="list-style-type: none"> • Microsoft PowerPoint Lab - Creating, editing, and designing slides. Adding multimedia elements and animations.
Week 5	<ul style="list-style-type: none"> • Word Processing Techniques Lab - Mail merge and document collaboration exercises. Creating professional documents with advanced formatting.
Week 6	<ul style="list-style-type: none"> • Data Analysis Lab with Excel - Advanced formula and function exercises. Sorting, filtering, and analyzing data.
Week 7	<ul style="list-style-type: none"> • Presentation Design Lab with PowerPoint - Applying design principles to create visually appealing slides. Adding interactive elements and customizing slide layouts.
Week 8	<ul style="list-style-type: none"> • Collaboration and Sharing Lab - Collaborative document editing and reviewing. Sharing and protecting documents with permissions.
Week 9	<ul style="list-style-type: none"> • Automation and Customization Lab - Recording and running macros for repetitive tasks. Customizing the ribbon and creating shortcuts.
Week 10	<ul style="list-style-type: none"> • Integrating Office Applications Lab - Linking and embedding data between Word, Excel, and PowerPoint. Importing and exporting data between applications.
Week 11	<ul style="list-style-type: none"> • Advanced Tips and Tricks Lab - Exploring time-saving techniques and productivity hacks. Troubleshooting common issues and errors.
Week 12-15	<ul style="list-style-type: none"> • 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language II		Module Delivery
Module Type	B		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MTU1003		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level		UGx11 2	
Administering Department		MIET	College
Module Leader		Athraa Hani	e-mail
Module Leader's Acad. Title		Assistant Lecturer	Module Leader's Qualification
Module Tutor			e-mail
Peer Reviewer Name		Assnt.Prof.Dr./Saad A. Makki	e-mail
Scientific Committee Approval Date		19/10/2023	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

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:

1. *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.

2. *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.

3. *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.

4. *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.

Module Aims

أهداف المادة الدراسية

5. *Writing Competence:*

- Enhance writing skills by composing various forms of written content, 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.

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:*

	<p>- Work towards achieving greater fluency in English, allowing students to engage in complex conversations, express nuanced ideas, and write with increased sophistication and ease.</p> <p>12. *Cultural Competency:*</p> <p>- 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.</p> <p>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.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Module Learning Outcomes</p> <p>Students will comprehend and discuss a variety of texts on diverse topics, enhancing their reading and analytical skills.</p> <p>Students will expand their vocabulary related to various topics, including everyday expressions, actions, experiences, and descriptive details.</p> <p>Students will be able to write various forms of text, including short stories, comparative essays, descriptive passages, and reviews.</p> <p>Students will use auxiliary verbs correctly in sentences, mastering their application in different tenses.</p> <p>Students will distinguish between present simple, past simple, present continuous, and present perfect tenses, understanding their appropriate contexts.</p>

	<p>Students will study and apply modal verbs such as must, should, can, and could, understanding their use in expressing necessity, possibility, and advice.</p> <p>Students will understand and correctly use comparative and superlative adjectives to describe and compare objects and situations.</p> <p>Students will focus on verb patterns and express future intentions using appropriate grammatical structures.</p> <p>Students will learn the correct usage of first and second conditionals and the passive voice in various contexts.</p> <p>Students will effectively use defining and non-defining relative clauses to provide additional information in sentences.</p> <p>Students will describe ongoing actions and experiences using the present perfect continuous tense and appropriate time expressions.</p> <p>Students will learn to report statements, questions, and commands accurately, mastering the use of reported speech.</p> <p>Students will discuss hypothetical situations and understand the use of time and conditional clauses in various contexts.</p> <p>Students will acquire and use advanced vocabulary, including phrasal verbs and synonyms/antonyms, in both written and spoken communication.</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Intermediate Book (Based on "New Headway Plus: Intermediate Student's Book")</p> <p>Total Hours: 21 hours</p> <p>Week 1 (2 hours)</p>

	<p>Grammar: Auxiliary Verbs (Unit 1)</p> <p>Focus: Usage of "to be," "have," and other auxiliary verbs.</p> <p>Vocabulary: Everyday Expressions (Unit 1)</p> <p>Reading: "It's a Wonderful World!" (Unit 1)</p> <p>Writing: Basic sentences using auxiliary verbs</p> <p>Week 2 (2 hours)</p>
	<p>Grammar: Present Simple (Unit 2)</p> <p>Focus: Usage in daily routines and habits.</p> <p>Vocabulary: Common Activities (Unit 2)</p> <p>Reading: "Get Happy!" (Unit 2)</p> <p>Week 3 (2 hours)</p>
	<p>Grammar: Present Continuous (Unit 2)</p> <p>Focus: Actions happening now.</p> <p>Vocabulary: Actions and Activities (Unit 2)</p> <p>Reading: "Simple or Continuous?" (Unit 2)</p> <p>Week 4 (2 hours)</p>
	<p>Grammar: Past Simple (Unit 3)</p> <p>Focus: Narrating past events.</p> <p>Vocabulary: Telling Stories (Unit 3)</p> <p>Reading: "Telling Tales" (Unit 3)</p> <p>Writing: Writing a short story using past simple tense</p> <p>Week 5 (2 hours)</p>
	<p>Grammar: Present Perfect (Unit 1, 3)</p> <p>Focus: Describing experiences and actions with present relevance.</p> <p>Vocabulary: Experiences and Achievements (Unit 1, 3)</p> <p>Reading: "Present Perfect Stories" (Unit 1, 3)</p> <p>Week 6 (2 hours)</p>

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)

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)

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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.

Strategies

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

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)	17	Unstructured SWL (h/w)	1

الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50		

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

	<p>Reading: "Telling Tales" (Intermediate: Unit 3)</p> <p>Writing: Writing a short story using past simple tense (Intermediate: Unit 3)</p>
Week 5	<p>Grammar: Present Perfect (Intermediate: Unit 1, 3)</p> <p>Vocabulary: Experiences and Achievements (Intermediate: Unit 1, 3)</p> <p>Reading: "Present Perfect Stories" (Intermediate: Unit 1, 3)</p>
Week 6	<p>Grammar: Future Forms (Intermediate: Unit 5)</p> <p>Vocabulary: Plans and Predictions (Intermediate: Unit 5)</p> <p>Reading: "On the Move" (Intermediate: Unit 5)</p>
Week 7	<p>Grammar: Questions and Negatives (Intermediate: Unit 4)</p> <p>Vocabulary: Social Interactions (Intermediate: Unit 4)</p> <p>Reading: "Nothing but the Truth" (Intermediate: Unit 4)</p>
Week 8	<p>Grammar: Modals (Intermediate: Unit 4, 7)</p> <p>Vocabulary: Permissions and Possibilities (Intermediate: Unit 4, 7; Upper-Intermediate: Unit 7)</p> <p>Reading: "Doing the Right Thing" (Intermediate: Unit 4; Upper-Intermediate: Unit 7 "Getting on Together")</p>
Week 9	<p>Grammar: Comparatives and Superlatives (Intermediate: Unit 6)</p> <p>Vocabulary: Describing Characteristics (Intermediate: Unit 6; Upper-Intermediate: Unit 6)</p> <p>Reading: "Making Comparisons" (Intermediate: Unit 6; Upper-Intermediate: Unit 6 "Making it Big")</p> <p>Writing: Comparative essay (Intermediate: Unit 6)</p>
Week 10	<p>Grammar: Conditionals (Intermediate: Unit 8)</p> <p>Vocabulary: Hypothetical Situations (Intermediate: Unit 8; Upper-Intermediate: Unit 8)</p> <p>Reading: "Just Imagine!" (Intermediate: Unit 8; Upper-Intermediate: Unit 8 "Going to Extremes")</p>
Week 11	<p>Grammar: Passive Voice (Intermediate: Unit 2, 3)</p> <p>Vocabulary: Actions and Consequences (Intermediate: Unit 2, 3; Upper-Intermediate: Unit 7)</p> <p>Reading: "Passive Constructions" (Intermediate: Unit 2, 3; Upper-Intermediate: Unit 7 "Getting on Together")</p>
Week 12	<p>Grammar: Relative Clauses (Intermediate: Unit 8)</p> <p>Vocabulary: Descriptive Details (Intermediate: Unit 8; Upper-Intermediate: Unit 8)</p> <p>Reading: "Descriptive Sentences" (Intermediate: Unit 8; Upper-Intermediate: Unit 8 "Going to Extremes")</p>
Week 13	<p>Grammar: Present Perfect Continuous (Intermediate: Unit 10)</p> <p>Vocabulary: Time Expressions (Intermediate: Unit 10; Upper-Intermediate: Unit 10)</p> <p>Reading: "Obsessions" (Intermediate: Unit 10; Upper-Intermediate: Unit 10 "Risking Life and Limb")</p>

	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 in the Library?
Required Texts	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Laboratory Medical Instrumentation II		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	MIET2201		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UGII	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Esaam alhusaini	e-mail	Esaam.falih@gmail.com
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	None	e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki	e-mail	Saad.a.reda@meuc.edu.iq
Scientific Committee Approval Date	8/11/2023	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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Upon completion of the course, students should be able to:</p> <ol style="list-style-type: none"> 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
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following: Medical instrumentation definition, analysis lists, work security rules, and best laboratory use guidelines [14hr].</p> <p>Laboratory instruments criteria, types, components, advantages and</p>

	<p>disadvantages, physical and medical application. [12hr].</p> <p>Medical instrumentation faults and maintenance, analysis lists, work security rules, and best laboratory use guidelines [14 hr].</p> <p>Explain Polymerase chain reaction (pcr)and definition of Laboratory incubators[14 hr].</p> <p>Types of Laboratory Incubators and oven and its medical application[14hr].</p> <p>Autoclave medical application and water distillation[14hr].</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>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.</p>

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 أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	81	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation					
تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2) • (1 %	,10 ³	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	
Week	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.

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

Module Information					
معلومات المادة الدراسية					
Module Title	Electronic Circuits II			Module Delivery	
Module Type	Core			<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET2202				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UG11	Semester of Delivery		4
Administering Department		MIET	College	EETC	
Module Leader	Ali Ghazi		e-mail	Ali7new@mtu.edu.iq	
Module Leader's Acad. Title		Lecturer	Module Leader's Qualification		MSc
Module Tutor			e-mail		
Peer Reviewer Name	Prof. Dr. Ahmed R. Ajel		e-mail	Dr_ahmed.r@mtu.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	UGII-S3
Co-requisites module	None		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Become aware of the general characteristics of electronic devices. 2. Be able to describe the difference types of electronic categories. 3. Develop a clear understanding of the basic operation and characteristics of electronic devices. 4. Become familiar with the use of equivalent circuits to analyze series, parallel, and series-parallel electronic networks. 5. Be able to predict the output response of an electronic networks. 6. Become familiar with the analysis of and the range of applications for electronic devices. 7. Become familiar with the basic construction and operation of the various types of electronic categories! 8. Be able to test a various type of electronic terminals. 9. Be able to determine the dc levels for the variety of important electronic circuits. 10. Understand how to measure the important voltage levels of electronic circuits. 11. Begin to understand the troubleshooting process as applied to electronic configurations. 12. Develop a sense for the stability factors of an electronic circuits. 13. Learn to use the equivalent model to find the important ac parameters for an amplifier. 14. Develop some skill in troubleshooting ac amplifier networks.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A Electronic Theory</u></p> <p>JFETs: n -channel, p -channel, TRANSFER CHARACTERISTICS, Shockley's Equation , Shorthand Method [10 hrs]</p> <p>FET Biasing -Fixed-bias configuration, self-bias configuration, voltage-divider bias arrangement; common gate configuration , depletion-type MOSFETs , enhancement-type MOSFET [10 hrs]</p> <p>Revision problem classes [6 hrs]</p>

	<p style="text-align: right;"><u>Part B – Frequency response</u></p> <p>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]</p> <p>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]</p> <p><u>Part C - Power Amplifiers</u></p> <p>Series-Fed Class A Amplifier- Transformer-Coupled Class A Amplifier, Class B Amplifier Operation, Class B Amplifier Circuits, Amplifier Distortion.[10 hrs]</p> <p>Power Supplies (Voltage Regulators) [12 hrs]</p>
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<p style="text-align: center;">Learning and Teaching Strategies استراتيجيات التعلم والتعليم</p>	
<p>Strategies</p>	<p>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.</p>

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	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
As		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) المنهاج الاسبوعي النظري	
Week	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) المنهاج الاسبوعي للمختبر	
Week	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 التعلم والتدريس

	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/electrical-engineering	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Digital Electronics		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET2203			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGx11 2	Semester of Delivery		4
Administering Department	MIET	College	EETC	
Module Leader	Assnt.Prof.Dr./Saad A. Makki		e-mail	Saad.a.reda@meuc.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	pH	
Module Tutor			e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki		e-mail	Saad.a.reda@meuc.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	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>At ending of course, student will:</p> <ol style="list-style-type: none"> 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.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Numbers systems, Binary, Octal, Hexadecimal [4 H].</p> <p>Codes numbers [4 H].</p> <p>Arithmetic circuits [10 H].</p> <p>De Margan's theorems [4 H].</p> <p>Karnaugh map [8 H].</p> <p>Flip – Flop: RS, RST, JK, D, FF [8 H].</p> <p>Asynchronous counter and synchronous [10 H].</p> <p>Shift registers [10 H].</p> <p>Multiplexer, De multiplexer [4 H].</p> <p>Decoder [8 H].</p> <p>Analog conversion [4 H].</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	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

As		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

Week	Material Covered
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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

Week	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_Catch_all_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=CjwKCAjwp6CkBhB_EiwAlQVyxcuQ427tsVehXbetXE4NUFlekP4rqq-PrCWgQflucPuo7Mqz8SXRvxoC5asQAvD_BwE	

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	Clinical Chemistry instrumentation		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MIET2204		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Noor Najim	e-mail	Noor.najim@gmail.com
Module Leader's Acad. Title	Assnt.lect.	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki	e-mail	saad.a.reda@meuc.edu.iq
Scientific Committee Approval Date	8/11/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1.To introduce the clinical chemistry and biochemical mechanism in the human body 2.To describe the types of laboratory medical instruments. 3. To describe the types of clinical chemistry analysis or (tests). 4. To explain the principal work of the laboratory medical devices techniques. 5. To describe the most important compositions in human body. 6. To understanding the maintenance of laboratory medical devices and its electrical and mechanical faults.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>Upon completion of the course, students should be able to:</p> <ol style="list-style-type: none"> 1.Define the clinical chemistry and recognize what is the laboratory security system and determine the quality control results in medical laboratory. 2. List the principal work of spectrophotometer instruments and derive Beer's-Lambert Law. 3.Describe the measurement instruments of ions and salts in human body. 4. Identify all the clinical chemistry analysis and their measurement techniques. 5. Discuss the importance of minerals in human body and their measurement. 6. Describe the principal work of Elisa technique and list their methods. 7. Explain the electrical conduction concept and their examples in human body. 8. Explain the osmotic conduction concept and their examples in human body. 9. List the types and function of enzyme in human body and their measurements techniques. 10. Discuss the importance of proteins in human body and describe their measurements. 11. Explain the importance of fats in human body and explain their measurement techniques. 12. Define the hemoglobin and explain the hemoglobin diseases with its clinical significant. 13. List all types of minerals in human body and describe their daily requirements. 14. Define the immune system and recognize the foreign material and explain the disorders of immune system.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following:</p>

	<p>Clinical chemistry definition, analysis lists, work security rules, best laboratory uses guidelines. [3hr].</p> <p>Spectrophotometer instruments criteria, theory, types, components, advantage and disadvantage, physical and medical application and Beer-Lambert law derivative .[10hr]</p> <p>Electrolyte analyzer definition, features, theory, components, configuration advantages, disadvantages and application. [6hr]</p> <p>Autoanalyzer concept, Blood Gas Analyzer (BGA) criteria, types, theory, components, figuration, advantages and disadvantages. [6hr]</p> <p>ELISA Technique concept, theory ,methods:(direct and indirect), components ,figuration, advantages ,disadvantages and applications [6hr].</p> <p>Minerals definition, classifications, sources, function, nutrition(mg/day) and diagnostic procedure[6hr].</p> <p>Electrical conduction concept , examples ,performing tests. Osmotic conduction concept, examples ,performing tests [10hr].</p> <p>Enzyme definition, classification, function, performing test and clinical significant. [6hr]</p> <p>Proteins definition, classification ,function, clinical significant, Electrophoresis Technique :diagnostic procedure, theory and principle work [6hr].</p> <p>Fats concept, classification, sources, importance, clinical signification and measurements: Hydro densitometry Weighing (Underwater Weighing, Near – infrared interaction (NIR), Skin Fold Caliper, Dual energy X-ray absorptiometry (DEXA), BMI (Body mass impedance) [10hr] .</p> <p>Hemoglobin definition, structure, analysis, hemoglobin diseases, clinical significant and diagnostic procedure: complete blood count (CBC) [6hr].</p> <p>Concept of immunology, structure, material and disease diagnostic [3hr].</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lectures - scientific laboratory- data show - summer training- workshops- seminars, written exam, Quizzes and online testing .

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 أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	٢	١٠%	3, 11	LO:1,2,3.....14
	Assignments	2	10%	7,10	LO: 6, 13
	Projects / Lab.	٢	10%	4,8	LO: 3, 10
	Report	1	10%	11	LO: 10,12
Summative assessment	Midterm Exam	2 hr	10%	7	LO: 1-7
	Final Exam	3 hr	50%	14	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction ,Best laboratory uses and quality control.
Week 2	Spectrum instruments and uses.
Week 3	Ion and salt measurement instruments
Week 4	Auto-analysis instruments
Week 5	Mineral measurement instrument
Week 6	Elisa instrument and its uses
Week 7	Mid term Exam

Week 8	Electrical conduction
Week 9	Osmotic conduction
Week 10	Enzyme and their measurement
Week 11	Protein and its importance
Week 12	Fats and its importance
Week 13	Hemoglobin
Week 14	Minerals and nutrition
Week 15	Immunological chemistry
Week 16	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Introduction to Clinical Chemistry instrumentation
Week 2	Lab1: spectrophotometer and colorimeter, theory, principle of work, operation, component's function, maintenance and the faults.
Week 3	Lab2: Flame photometer, types, theory, principle of work, operation, component's function, maintenance and the faults.
Week 4	Lab3: Blood gas analyzer and PH meter, theory, principle of work, operation, components function, normal results, maintenance and the faults.
Week 5	Lab4: Auto-analysis, types, theory, principle of work, operation, component's function, maintenance and the faults.
Week 6	Lab5: Elisa, types, theory, principle of work, operation, components function, maintenance and the faults.
Week 7	Lab6: Hemodialysis and peritoneal technique, theory, principle of work, operation, maintenance and faults.
Week 8	Lab7: Electrophoresis, theory, principle of work, operation, component's function, normal results, maintenance and the faults.
Week 9	Lab 8: Body fat analyzer, theory, principle of work, operation, component's function, normal results, maintenance and the faults.
Week 10	Lab 9: review for the clinical chemistry instrumentation.

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Clinical Chemistry Hand book :workbook of principles ,techniques and correlation by N.T.Coleman	Yes
Recommended Texts	LABORATORY INSTRUMENTATION AND TECHNIQUES, Book by Dr.Mathew Folaranmi OLANIYAN,Associate Professor,Department of Medical Laboratory Science,Achievers University, Owo-Nigeria,2017.	No
Websites	1. https://byjus.com/chemistry/spectrophotometer-principle/ 2.3. https://www.bosterbio.com/media/pdf/ELISA_Handbook.pdf 3.	

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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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Biomedical Transducers and Sensors		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> 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	Ali Amer Ahmed		e-mail	Ali.amer@gmail.com
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor			e-mail	
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki		e-mail	Saad.a.reda@meuc.edu.iq
Scientific Committee Approval Date	8/11/2023		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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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. 12. Recognize the main parts of ultrasound transducers. 13. List the main features of intelligent sensors.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p><u>Indicative Contents including the following:</u></p> <p>General concept and terminology, Sensor classification and calibration, static and dynamic characteristics, errors [10 hrs]</p> <p>Resistive Temperature Detectors (RTD), Thermistors, light-dependent resistors, signal conditioning for resistive sensors [5hrs]</p> <p>Capacitive sensors, Inductive sensors,</p>

	<p>Electromagnetic sensors, signal conditioning for reactance variation sensors [5 hrs]</p> <p>Thermoelectric sensors, Piezoelectric sensors, Electrochemical sensors, Signal conditioning for self-generating sensors.[7 hrs]</p> <p>Optical techniques, General principles of optical sensing, Fiber-optic basics, Fiber-optic sensor technologies and applications[7 hrs]</p> <p>Fundamentals of ultrasonic-based sensors, Ultrasonic-based sensing methods and applications.[8 hrs]</p> <p>Definition, parameters, features, operating principle , main building blocks and applications.[5 hrs]</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>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.</p> <ul style="list-style-type: none"> ➤ 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 discussions and 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.

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 أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		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	
Week	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	
Week	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 using 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
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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.

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		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MTU1007			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	2	Semester of Delivery	3	
Administering Department	MIET	College	EETC	
Module Leader	Aya Hassan		e-mail	Aya.hassan@gmail.com
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor		e-mail		
Peer Reviewer Name	Assnt.Prof.Dr./Saad A. Makki	e-mail	Saad.a.reda@meuc.edu.iq	
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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>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 :</p> <ol style="list-style-type: none"> ١. فهم مفهوم الجرائم وأقسامها. ٢. دراسة جرائم نظام البعث والقوانين المتعلقة بها. ٣. التعرف على الجرائم النفسية والاجتماعية وآثارها على الفرد والمجتمع. ٤. تحليل الانتهاكات القانونية في العراق، بما في ذلك الانتهاكات لحقوق الإنسان والجرائم ذات الصلة. ٥. فهم الجرائم البيئية وآثارها، بما في ذلك التلوث وتدمير المدن والقرى وتجفيف الأهوار. ٦. دراسة جرائم المقابر الجماعية وفهم أحداث المقابر والتصنيف الزمني لها في العراق.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>مخرجات التعلم للمادة الدراسية هي:</p> <ol style="list-style-type: none"> ١. فهم مفهوم الجرائم وقدرة الطلاب على تصنيف الجرائم وفقاً لأقسامها. ٢. تحليل جرائم نظام البعث وفهم القوانين المتعلقة بها، بما في ذلك الجرائم الدولية. ٣. القدرة على التعرف على الجرائم النفسية لنظام البعث وفهم الآثار النفسية لجرائم نظام البعث على الأفراد والمجتمع. ٤. القدرة على التعرف على الجرائم الاجتماعية لنظام البعث والآثار الاجتماعية لجرائم نظام البعث على الأفراد والمجتمع. ٥. التعرف على الانتهاكات القانونية لنظام البعث في العراق وفهم أنواع الانتهاكات ومكان احتجاز الأفراد. ٦. التعرف على صور انتهاكات حقوق الإنسان وجرائم السلطة التي وقعت خلال فترة نظام البعث. ٧. التعرف على الانتهاكات السياسية والعسكرية لنظام البعث. ٨. فهم الجرائم البيئية لنظام البعث والقدرة على تحليل تأثيرها على البيئة والمجتمع. ٩. دراسة جرائم المقابر الجماعية لنظام البعث. ١٠. فهم الأحداث المرتبطة بجرائم المقابر الجماعية وتصنيفها زمنياً.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>المحتويات الإرشادية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم. ومن بين المحتويات الإرشادية المهمة:</p> <ol style="list-style-type: none"> ١. تعريف الجريمة لغة واصطلاحاً، مفهوم الجريمة، اقسام الجريمة ٢. جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005 ٣. الجرائم النفسية والاجتماعية وآثارها ٤. عسكرة المجتمع، موقف النظام البعثي من الدين ٥. انتهاكات القوانين العراقية، صور انتهاكات حقوق الإنسان وجرائم السلطة ٦. بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث ٧. أماكن السجون والاحتجاز لنظام البعث ٨. الجرائم البيئية لنظام البعث في العراق ٩. جرائم المقابر الجماعية ١٠. أحداث مقابر الإبادة الجماعية المرتكبة من النظام البعثي في العراق ١١. التصنيف الزمني لمقابر الإبادة الجماعية في العراق للمدة 1963م - 2003م

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>استراتيجيات التعلم والتعليم المستخدمة في مادة جرائم حزب البعث تشمل مجموعة متنوعة من النهج والتقنيات التي تعزز عملية التعلم للطلاب. من بين هذه الاستراتيجيات:</p> <ol style="list-style-type: none"> ١. التفاعل النشط: يتم تشجيع الطلاب على المشاركة والمشاركة الفعالة في الدروس من خلال المناقشات الجماعية والأنشطة التفاعلية. ٢. التعلم التعاوني: يشجع التعاون والتعاون بين الطلاب من خلال العمل الجماعي والمشاريع الجماعية، حيث يتعاون الطلاب مع بعضهم البعض لتحقيق أهداف التعلم المحددة. ٣. استخدام التقنيات الحديثة: يستفيد الطلاب من استخدام التكنولوجيا في عملية التعلم، مثل استخدام الحواسيب والإنترنت للبحث والتعلم الذاتي. ٤. 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. ٥. 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.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	تعريف الجريمة لغة واصطلاحاً، مفهوم الجريمة، اقسام الجريمة	الأسبوع الأول
	جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005	الأسبوع الثاني
	الجرائم النفسية لنظام البعث وفهم الآثار النفسية لجرائم نظام البعث على الأفراد والمجتمع.	الاسبوع الثالث
	الجرائم الاجتماعية لنظام البعث وفهم الآثار الاجتماعية لجرائم نظام البعث على الأفراد والمجتمع.	الأسبوع الرابع
	انتهاكات القوانين العراقية	الأسبوع الخامس

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

As		Time/ Number	Weight (Marks)	Week Due	Relevant Learning 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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		معلومات المادة الدراسية	
Module Title	Arabic Language (2)	Module Delivery	
Module Type	Basic	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MTU1009		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2		
Administering Department	ENG - STE	College	EETC
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	15/10/2024	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>أهداف المادة الدراسية هي اني يكون الطالب قادراً على أن :</p> <ol style="list-style-type: none"> ١. يتعرف على ماهية التعبير القرآني. ٢. يتعلم القواعد النحوية المستعملة في التعبير القرآني، والأثر البلاغي والفني الذي يترتب على كيفية التعبير القرآني، وأن يفهم الطالب كيفية التحليل للنصوص القرآنية. ٣. يتعرف على شخصية من أهم شخصيات الأدب والشعر العربي والعراقي، بدر شاكر السياب، ومعرفة شعره. ٤. يتعرف على علامات الإعراب الأصلية والفرعية، ويتعلم استعمالها في اللغة العربية، ويفهم الفرق بين علامات الإعراب الفرعية والأصلية. ٥. يتعلم الفرق بين الجمل الأسمية والفعلية، ويتعرف على أنواع المبتدأ، وأنواع الخبر، ويفهم الفرق بينهما. ٦. يتعرف على إن وأخواتها، ويتعلم القواعد الخاصة بها. ٧. يفهم الفرق بين إنَّ وأنَّ، وأنَّ وأنَّ، ويطبق ذلك عند استعمال كل منها في النصوص. ٨. يتعرف على كان وأخواتها، ويتعلم عمل كل منها في اللغة، ويتمكن من استعمالها الصحيح في اللغة. ٩. يتعرف على عمل الأفعال الخمسة، وعلامات إعرابها، ويستطيع استعمالها بشكل صحيح في الخطاب، أو النص. ١٠. يتعرف على الأخطاء اللغوية، ويتعلم تجنبها أثناء الكتابة. ١١. يدرس معلومات لغوية : الأضداد والمرادفات، والفرق اللغوية، والمعاملات النحوية، ويفهم الفرق بينها، ويتمكن من تحليلها. ١٢. يتعلم إعراب المثنى. ١٣. يتعرف على أنواع الجموع، ويتعلم التفريق بينها، ويفهم كيفية إعرابها. ١٤. يتعلم كيفية كتابة قواعد اللغة العربية في لوحة بيانية، ويتمكن من تصويب الأخطاء اللغوية.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>مخرجات التعلم للمادة الدراسية هي:</p> <ol style="list-style-type: none"> ١. قدرة الطالب على فهم التعبير القرآني، وتحليل النصوص. ٢. القدرة على استخدام القواعد النحوية، وفهم الأساليب البلاغية والقدرة على استعمالها. ٣. معرفة الطالب لشخصية الشاعر والأديب بدر شاكر السياب، وأهم أشعاره وآثاره. ٤. القدرة على التمييز بين علامات الإعراب الأصلية والفرعية، والقدرة على استعمالها في الخطاب، أو النص. ٥. قدرة الطالب على التمييز بين الجمل الأسمية والفعلية، وقدرته على التمييز بين أنواع المبتدأ، والخبر، وكيفية استعمال الجمل وإعرابها. ٦. فهم الطالب لعمل إنَّ وأخواتها، وقدرته على استعمالها بشكل صحيح في الجمل. ٧. القدرة على التفريق بين أنَّ وإنَّ، وإنَّ وإنَّ، واستعمالها في مواضعها الصحيحة في النصوص. ٨. القدرة على فهم عمل كان وأخواتها، واستعمالها بشكل صحيح. ٩. التمكن من معرفة وأعراب الأفعال الخمسة، وكيفية استعمالها في الجمل. ١٠. القدرة على معرفة وتجنب الأخطاء اللغوية عند الكتابة. ١١. معرفة إعراب المثنى. ١٢. القدرة على التمييز بين الجموع، وكيفية إعرابها، واستعمالها في الجمل. ١٣. معرفة الطالب لمعلومات لغوية : المرادفات. والأضداد، والفرق اللغوية، والمعادلات النحوية، والقدرة على استخراجها، أو استعمالها في الجمل.
<p>Indicative Contents</p>	<p>المحتويات الإرشادية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم. ومن بين المحتويات الإرشادية المهمة:</p>

المحتويات الإرشادية	<p>١. مقدمة عن التعبير القرآني، وتعريف بالإعجاز اللغوي في آيات القرآن الكريم وجمالية اللغة العربية وبلاغتها. (٤ ساعات)</p> <p>٢. التعريف بشخصية الشاعر الكبير بدر شاكر السياب ، وأهمية شعره في الأدب العربي والعراقي. (٤ ساعات)</p> <p>٣. دراسة علامات الإعراب ، بنوعيتها ، وكيفية الأعراب . (٤ ساعات)</p> <p>٤. دراسة الجمل الأسمية والفعلية ، وتعلم التفريق بين الأنواع المبتدأ ، وأنواع الخبر. (٤ ساعات)</p> <p>٥. دراسة إن وأخواتها ، وكيفية عملها وأعرابها . (٤ ساعات)</p> <p>٦. دراسة الفرق بين إنَّ وأنَّ، وإنَّ وأنَّ، وكيفية عملها وأعرابها. (٤ ساعات)</p> <p>٧. دراسة كان وأخواتها ، وكيفية عملها وإعرابها. (٤ ساعات)</p> <p>٨. التعريف بالأفعال الخمسة ، وعملها وإعرابها. (٤ ساعات)</p> <p>٩. دراسة الأخطاء اللغوية الشائعة وتطبيقاتها في النصوص. (٤ ساعات)</p> <p>١٠. تعلم المعلومات اللغوية : الأضداد والمترادفات، والفروق اللغوية ، والمعادلات النحوية. (٣ ساعات)</p> <p>١١. دراسة المثنى وأعرابه. (٣ساعات)</p> <p>١٢. دراسة الجموع ، وأنواعها وإعرابها. (٣ ساعات)</p> <p>١٣. دراسة القواعد النحوية وكتابتها في رسم بياني ، وتصويب الأخطاء اللغوية. (٣ ساعات)</p>
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استراتيجيات التعلم والتعليم Learning and Teaching Strategies

Strategies	<p>استراتيجيات التعلم والتعليم المستخدمة في مادة اللغة تشمل مجموعة متنوعة من النهج والتقنيات التي تعزز عملية التعلم للطلاب. من بين هذه الاستراتيجيات:</p> <p>١. التفاعل النشط: يتم تشجيع الطلاب على المشاركة والمشاركة الفعالة في الدروس من خلال المناقشات الجماعية والأنشطة التفاعلية.</p> <p>٢. التعلم التعاوني: يشجع التعاون والتعاون بين الطلاب من خلال العمل الجماعي والمشاريع الجماعية، حيث يتعاون الطلاب مع بعضهم البعض لتحقيق أهداف التعلم المحددة.</p> <p>٣. التطبيق العملي: يتم توفير فرص للطلاب لتطبيق المفاهيم والمهارات المكتسبة في سياقات عملية وواقعية، مما يعزز التفاعل الفعال مع المادة.</p> <p>٤. استخدام التقنيات الحديثة: يستفيد الطلاب من استخدام التكنولوجيا في عملية التعلم، مثل استخدام الحواسيب والإنترنت للبحث والتعلم الذاتي.</p> <p>٥. 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.</p> <p>٦. 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.</p> <p>٧. باستخدام هذه الاستراتيجيات، يتم تعزيز التفاعل والتعلم الفعال للطلاب، و تحفيزهم على المشاركة واكتساب المعرفة والمهارات بشكل شامل وشيق.</p> <p>٨.</p>
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الحمل الدراسي للطلاب محسوب ل ١٥ اسبوعاً Student Workload (SWL)

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

<p>المنهاج الاسبوعي النظري</p> <p>Delivery Plan (Weekly Syllabus)</p>	
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 .
الاسبوع 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	أنَّ وأخواتها
الأسبوع السابع	الفرق بين إنَّ وأنَّ ، وأنَّ وإنَّ.
الأسبوع الثامن	كان وأخواتها.
الأسبوع التاسع والعاشر	الأفعال الخمسة .
الاسبوع الحادي عشر	الأخطاء اللغوية الجزء (٢)
الاسبوع 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 التكسير .
الأسبوع السادس عشر	هندسة النحو: قواعد اللغة العربية في لوحة تعليمية ، وتصويبات لغوية

<p>Module Evaluation</p> <p>تقييم المادة الدراسية</p>					
As	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)			

<p>Learning and Teaching Resources</p> <p>مصادر التعلم والتدريس</p>		
	Text	Available in the Library?
Required Texts	٢. ملزمة اللغة العربية (المعممة من وزارة التعليم العالي والبحث العلمي)	Yes
Recommended Texts	٣. 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 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	Medical Diagnostic Instrumentation II		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> 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	Ghaidaa Abdulrahman Khalid		e-mail	ghaidaakhalid@mtu.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	
Peer Reviewer Name	Ali Abdulelah Al-Naji		e-mail	ali_al_naji@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023		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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>The module aims:</p> <ol style="list-style-type: none"> 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 medical 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
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>By the end of the module, students should be able to:</p> <ol style="list-style-type: none"> 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.

	<p>8. Basic knowledge and understanding of the inventive process and its management, the entrepreneurial basis of business development; exploitation and value of Intellectual Property.</p> <p>9. This gives you a solid understanding of how engineering improves patient care.</p> <p>10. Having the opportunity to gain valuable experience within a clinical environment – learning about the anatomy and functions of the human biology.</p> <p>11. Develop research and business management skills within the biomedical industry.</p> <p>12. the application of engineering principles and design concepts to human biology and medicine, to solve challenges in the healthcare industry.</p> <p>13. Gain an all-rounded understanding of where and how the technologies you develop will be used.</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>The indicative contents of module include:</p> <p><u>Part A:</u></p> <ul style="list-style-type: none"> • 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.] <p><u>Part B:</u></p> <ul style="list-style-type: none"> • Characteristics of detection systems, amplification, noise/noise reduction and biomedical sensor and detector types. • Measurement constraints in the physical environment. [8 hrs.] <p><u>Part C:</u></p> <ul style="list-style-type: none"> • 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. <p>[8 hrs.]</p> <p><u>Part D:</u></p> <ul style="list-style-type: none"> • Overview of diagnostic and interventional ultrasound and review of likely future developments. • Introduction to the objectives and practice of clinical diagnostic imaging. <p>[12 hrs.]</p>

	<p style="text-align: right;"><u>Part E:</u></p> <ul style="list-style-type: none"> • Introduction to interventional principles, overview of instrumentation and devices, open, minimally invasive and image guided surgery. <p style="text-align: right;">[12 hrs.]</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>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:</p> <p><u>Teaching methods include:</u></p> <ul style="list-style-type: none"> • lectures • seminars • tutorials • lab experiments • design assignments • industrial visits • professional training • a variety of projects <p style="text-align: right;">Assessment : methods of assessment include a combination of:</p> <ul style="list-style-type: none"> • coursework • group project reports • lab reports • written exams.

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	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
As		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	
Week	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. Three – Dimensional Ultrasound Imaging Systems, Portable Ultrasonic Imaging Systems, 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	
Week	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. 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	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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Microprocessor		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> 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 Leader	Mayss alreem Nizar hammed		e-mail Mayssalreem92@mtu.edu.iq
Module Leader's Acad. Title	Asst. lecturer	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	Prof. Dr. Ahmed R Ajel	e-mail	Dr_ahmed.r@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1- The student knows the definition of Microprocessor 8085 . 2- How to engage colleagues and stakeholders in managing information, knowledge and communication systems. 3. Design and implementation of 8085 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 8085MP and their capabilities.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>Upon completion of the course, students should be able to:</p> <ol style="list-style-type: none"> 1- Understand the difference between microprocessor and microcontroller 2- Understand application of microprocessor in medical devices 3- Know characteristics of 8085 microprocessor 4- Know the architecture of 8085 microprocessor 5- Know the pins of 8085 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
<p>Indicative Contents المحتويات الإرشادية</p>	<ol style="list-style-type: none"> 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					
As		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.	٦	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	
Week	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	
Week	Material Covered
Week 1	Lab 1: introduction to 8085 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 8085 (6th Edition)	NO
Websites	https://www.mediafire.com/file/xnu0xhfknbp9bml/sim8085_win_7.rar/file	

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
	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	Electromagnetic Fields		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET 3103			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UGIII	Semester of Delivery		5
Administering Department	MIET	College	EETC	
Module Leader	Mustafa F. Mahmood		e-mail	mustafa.falah@mtu.edu.iq
Module Leader's Acad. Title	Asst. Lec.		Module Leader's Qualification	MSc
Module Tutor			e-mail	
Peer Reviewer Name	Prof. Dr. Sadik Kamel Gharghan		e-mail	sadik.gharghan@mtu.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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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. 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.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following:</p> <ol style="list-style-type: none"> 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 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					
As		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	
Week	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	
Week	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&=null&index=prod all launched products term optimization. 2. www.tallguide.com 3. www.ainfoinc.com 4. www.millitech.com 5. www.rfcafe.com 6. www.globalspec.com	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Signals and Systems		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MIET3104		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Aws Alazawi	e-mail	aws_basil@mtu.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Ghaidaa Abdulrahman Khalid	e-mail	ghaidaakhalid@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ul style="list-style-type: none"> ✓ 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>By the end of the module, students should be able to:</p> <ul style="list-style-type: none"> ✓ 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 .
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Signals and classification of signals, basic continuous-time signals, basic discrete-time signals [7 hrs]</p> <p>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, response of a discrete-time LTI systems, systems described by differential equations , response system and convolution sum, properties and eigenfunctions of discrete-time LTI systems [10 hrs]</p> <p>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 of discrete-time LTI systems, the unilateral z-transform [14 hrs].</p> <p>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]</p>

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 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					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	15%(15)	5 and 10	LO #1 and #9
	Assignments	2	10%(10)	2 and 12	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

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

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	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	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Programming and Applications (C++ programming)		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MIET3105		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGIII	Semester of Delivery	5
Administering Department	MIET	College	EETC
Module Leader	Zina Ahmad	e-mail	zena@mtu.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	MSC
Module Tutor	Awss Jabbar Majeed	e-mail	awss_alogaidi@mtu.edu.iq
Peer Reviewer Name	Dr.Aws Alazawi	e-mail	aws_basil@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	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 switch statement, the continue and break statements, number-reading loops, basic file

	<p>input/output.</p> <p>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.</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>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.</p> <p>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]</p> <p>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.</p> <p>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]</p> <p>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]</p> <p>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</p>

	files, and random file access. [15 hrs]
	Revision problem classes [5 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>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.</p>

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	١٠% (١0)	2 and 12	LO #3, #4 and #6, #7
	Project/Lab	٥	١٠% (١0)	2 and 1٣	LO #٢, #4 and #٥, #٩
	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 الأسبوعي 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 الاسبوعي 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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Project Management		Module Delivery
Module Type	Support learning activity		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	MIET3106		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGIII	Semester of Delivery	
Administering Department	MIET	College	EECT
Module Leader	Mohammed Sameer Mohsen	e-mail	Mohammed.sh.c@mtu.edu.iq
Module Leader's Acad. Title	assistant lecturer	Module Leader's Qualification	MSc
Module Tutor		e-mail	
Peer Reviewer Name	Ali Abdulelah Al-Naji	e-mail	ali_al_naji@mtu.edu.iq
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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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 Method (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.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> 1. Introduction to Project Management: Elements, Objectives, and Phases(5) 2. Planning and Controlling in Projects(5) <ul style="list-style-type: none"> • Planning • Scheduling • Controlling 3. Project Planning Techniques(5) <ul style="list-style-type: none"> • Gantt chart

	<ul style="list-style-type: none"> • Critical Path Method (CPM) • Project Evaluation and Review Technique (PERT) <ol style="list-style-type: none"> 4. Crashing of Project Network(5) 5. Cost Account Methods(5) <ul style="list-style-type: none"> • Unit Cost Calculations • Break-Even Analysis Method 6. Depreciation Accounting Methods(5) <ul style="list-style-type: none"> • 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)
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<ul style="list-style-type: none"> • 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.

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 أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	0% (10)٢	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	
Week	Material Covered
Week 1	Project Management: Introduction, Elements, Objectives and Phases
Week 2	Planning, Scheduling and Controlling: Planning and Controlling in Projects
Week 3	- Gantt chart Project Planning Techniques
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	
Week	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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Medical Diagnostic Instrumentation II		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> 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	Ghaidaa Abdulrahman Khalid		e-mail	ghaidaakhalid@mtu.edu.iq
Module Leader's Acad. Title	Assistant Professor		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	
Peer Reviewer Name	Ali Abdulelah Al-Naji		e-mail	ali_al_naji@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023		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	<p>The module aims:</p> <ol style="list-style-type: none"> 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; To impart the basic theory and physiological interactions of medical imaging modalities (including microscopy, endoscopy, x-ray, ultrasound, CT, MRI, PET and IR) and review applications and image-guided interventions; To teach the basic physiological and anatomical principles of surgical interventions, interventional radiology and how the imaging objectives relate to disease and treatment 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. 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	<p>By the end of the module, students should be able to:</p> <ol style="list-style-type: none"> Understand the principles of operation of relevant sensors and detectors used in biomedical measurement for imaging and their technical specifications. Be able to apply a range of signal analysis and signal processing methods.

	<p>16. Understand how medical imaging systems work, how they interact with the tissue, how their images can be interpreted and the limitations of their application.</p> <p>17. Be familiar with a range of medical imaging applications for different pathologies, including cellular, molecular imaging and interventions.</p> <p>18. 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.</p> <p>19. Understand the requirements in quality spatial, contrast and time resolution of imaging modalities used for different outcomes.</p> <p>20. have knowledge of the research and engineering methods applied in the development of medical imaging.</p> <p>21. Basic knowledge and understanding of the inventive process and its management, the entrepreneurial basis of business development; exploitation and value of Intellectual Property.</p> <p>22. This gives you a solid understanding of how engineering improves patient care.</p> <p>23. Having the opportunity to gain valuable experience within a clinical environment – learning about the anatomy and functions of the human biology.</p> <p>24. Develop research and business management skills within the biomedical industry.</p> <p>25. the application of engineering principles and design concepts to human biology and medicine, to solve challenges in the healthcare industry.</p> <p>26. Gain an all-rounded understanding of where and how the technologies you develop will be used.</p>
<p>Indicative Contents المحتويات الإرشادية</p>	<p>The indicative contents of module include:</p> <p><u>Part A:</u></p> <ul style="list-style-type: none"> • 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.] <p><u>Part B:</u></p> <ul style="list-style-type: none"> • Characteristics of detection systems, amplification, noise/noise reduction and biomedical sensor and detector types. • Measurement constraints in the physical environment. [8 hrs.] <p><u>Part C:</u></p> <ul style="list-style-type: none"> • Principles and exemplar applications of x-ray and CT imaging. • Principles and exemplar applications of Nuclear and PET imaging.

	<ul style="list-style-type: none"> 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. <p>[8 hrs.]</p> <p><u>Part D:</u></p> <ul style="list-style-type: none"> Overview of diagnostic and interventional ultrasound and review of likely future developments. Introduction to the objectives and practice of clinical diagnostic imaging. <p>[12 hrs.]</p> <p style="text-align: right;"><u>Part E:</u></p> <ul style="list-style-type: none"> Introduction to interventional principles, overview of instrumentation and devices, open, minimally invasive and image guided surgery. <p style="text-align: right;">[12 hrs.]</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>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:</p> <p><u>Teaching methods include:</u></p> <ul style="list-style-type: none"> lectures seminars tutorials lab experiments design assignments industrial visits professional training a variety of projects <p style="text-align: right;">Assessment : methods of assessment include a combination of:</p> <ul style="list-style-type: none"> coursework group project reports lab reports

	<ul style="list-style-type: none"> 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					
As		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	
Week	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. Three – Dimensional Ultrasound Imaging Systems, Portable Ultrasonic Imaging Systems, 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	
Week	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	3. Khandpur , R. S. (1990) . Handbook of Biomedical Instrumentation , Tata McGraw Hill Publishing Co. 4. Joseph D. Bronzino (2006). The Biomedical Engineering Handbook, 3rd. Edition. Germany: Taylor & Francis.	Yes
Recommended Texts	4. Press.Joseph D. Bronzino (2006). Medical Devices and Human Engineering. (2017). United Kingdom: CRC Press. 5. Khandpur, R. S. (2004). Biomedical Instrumentation: Technology and Applications. India: McGraw Hill LLC. 6. Brown, J. M., Carr, J. J. (2001). Introduction to Biomedical Equipment Technology. India: Prentice Hall.	No
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
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Medical Electronic Systems	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET3202		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGIII		
Administering Department	MIET	College	EECT
Module Leader	Ali Abdulelah Al-Naji	e-mail	ali_al_naji@mtu.edu.iq
Module Leader's Acad. Title	Asst. Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Jameel Kaduim Abed	e-mail	Dr_jameel57@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	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	<ol style="list-style-type: none">6. To provide students with an understanding of electronic systems and their applications in the medical field.7. To develop students' knowledge and skills in designing, analyzing, and troubleshooting electronic circuits used in medical devices.8. To familiarize students with the principles and operation of regulated power supplies, switching regulators, clippers, clampers, voltage multiplier circuits, and their practical applications in medical electronic systems.9. To enhance students' ability to apply theoretical knowledge to practical scenarios and develop critical thinking skills in the context of medical electronics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">12. Demonstrate a comprehensive understanding of electronic systems and their relevance in the medical field.13. Design and analyze regulated power supplies, switching regulators, clippers, clampers.14. Design and analyze voltage multiplier circuits used in medical electronic systems.15. Explain the principles and operation of regulated power supplies, switching regulators, clippers, clampers, and voltage multiplier circuits.16. Apply theoretical knowledge to solve problems and troubleshoot electronic circuits used in medical devices.17. Evaluate the suitability of different electronic circuits for specific medical applications.18. Critically analyze and interpret data obtained from electronic measurements in medical electronic systems.19. Communicate effectively and professionally about medical electronic systems, both orally and in writing.20. Understand analog-to-digital conversion (ADC)21. Grasp digital-to-analog conversion (DAC)
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Part A: Regulated power supplies (Rectification) (20hrs)</u></p> <ul style="list-style-type: none">• Introduction to medical electronic systems• Half-wave and full-wave rectification• Understanding diodes and their characteristics

	<ul style="list-style-type: none"> • Rectifier circuits and waveforms • Capacitor filtering and its role in power supplies • Ripple factor and its significance in regulated power supplies • Calculation of filter capacitance • Design considerations for capacitor filters in medical devices • Linear voltage regulators and their operation • Zener diode regulators • IC regulators <p style="text-align: right;"><u>Part B: Clippers & Clampers (20hrs)</u></p> <ul style="list-style-type: none"> • Introduction to clippers and their role in signal conditioning • Diode clippers and their characteristics • Design considerations for clipping circuits • Applications of clippers in medical electronic systems • Positive and negative clampers • Design and analysis of clamping circuits • Use cases and limitations of clampers in medical devices. <p style="text-align: right;"><u>Part C: Operational Amplifiers (Op-Amps) (20hrs)</u></p> <ul style="list-style-type: none"> • Introduction to operational amplifiers and their applications in medical electronic systems • Op-Amp characteristics and ideal behavior • Practical applications <p style="text-align: right;"><u>Part D: Filters (LPF, HPF, PBF and PSF) (10hrs)</u></p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<ul style="list-style-type: none"> • Active Learning: Engage students through hands-on experiments, discussions, and problem-solving activities. • Practical Applications: Connect theoretical knowledge to real-world medical devices and systems. • Hands-on Experiments: Provide laboratory experiences to reinforce theoretical knowledge and develop practical skills. • Technology Integration: Utilize simulation software and virtual labs for circuit analysis and design.

	<ul style="list-style-type: none"> 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	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) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 10
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	Λ	% (10) 1	Continuous	
	Report	1	% (10) 5	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 Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to medical electronic systems
Week 2	Regulated power supplies (Rectification)

Week 3	Regulated power supplies (Filtration)
Week 4	Regulated power supplies (Regulation)
Week 5	Clippers
Week 6	Clampers Operations amplifiers OP-AMP applications
Week 7	Mid-Exam
Week 8	OP-AMP applications
Week 9	Active filters (LPF and HPF)
Week 10	Active filters (BPF and BSF)
Week 11	Passive filters (LPF and HPF)
Week 12	Passive filters (BPF and BSF)
Week 13	Analog to digital conversion (ADC)
Week 14	Digital to analog conversion (DAC)
Week 15	Practical applications Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Introduction to Multism
Week 2	Half-wave rectifier circuits
Week 3	full-wave rectifier circuits
Week 4	Designing capacitor filters for power supplies
Week 5	Building and testing voltage regulation circuits (Zener stages)
Week 6	Building and testing voltage regulation circuits (IC Regulators)
Week 7	Implementing and testing diode clipping circuits (negative and positive clippers)
Week 8	Implementing and testing diode clipping circuits (Full-wave Clippers)
Week 9	Designing and evaluating clamping circuits
Week 10	Constructing and testing operational amplifier circuits (Inverting and non-Inverting Op-Amp)
Week 11	Constructing and testing operational amplifier circuits (Comparator Op-Amp)
Week 12	Constructing and testing operational amplifier circuits (Integrator and Differentiator)
Week 13	Filters (LPF and HPF)
Week 14	Filters (PBF and PSF)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electronic Devices and Circuits Theory (Eleventh Edition) by Robert L. Boylestad and Louis Nashelsky	Yes
Recommended Texts		No
Websites	https://www.youtube.com/@aliabdulalahal-naji3192	

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.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Medical Communication systems	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET 3203		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII		
Administering Department	MIET	College	EETC
Module Leader	Mustafa F. Mahmood	e-mail	mustafa.falah@mtu.edu.iq
Module Leader's Acad. Title	Asst. Lecturer	Module Leader's Qualification	MSc
Module Tutor		e-mail	
Peer Reviewer Name	Prof. Dr. Sadik Kamel Gharghan	e-mail	sadik.gharghan@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	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 distinguishes 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 الدراسية	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 analogue modulation. 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
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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 أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		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	
Week	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) المنهاج الاسبوعي للمختبر	
Week	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 term optimization. 8. www.tallguide.com 9. www.ainfoinc.com 10. www.millitech.com 11. www.rfcafe.com 12. www.globalspec.com	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Power Electronics		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> 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	Jameel Kaduim Abed		e-mail	Dr_jameel57@mtu.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor			e-mail	
Peer Reviewer Name	Ajel Ahmed R. Prof. Dr.		e-mail	Dr_ahmed.r@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023		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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>10. To develop problem solving skills and understanding of power electronic theory through the application of techniques.</p> <p>11. To understand thyristor ,transistor as switching from a given circuit.</p> <p>12. This course deals with the basic concept of rectifier .</p> <p>13. This is the basic subject chopper.</p> <p>14. To understand ac-ac converter, inverter.</p> <p>15. Application of power electronics especially in medical instrument.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>22. Recognize how power electronic works in electrical circuits.</p> <p>23. List the various terms associated with power electronic.</p> <p>24. Summarize what is meant by a basic with power electronic.</p> <p>25. Discuss the reaction and involvement of in rectifier circuit.</p> <p>26. Describe thyristor ,transistor diode .</p> <p>27. Dc- dc converter.</p> <p>28. Identify the basic circuit elements and their applications.</p> <p>29. Discuss the operations of ac-ac converter.</p> <p>30. Discuss the various properties inverter.</p> <p>31. Explain the applications of power electronics in industry especially in medical equipment .</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A - Circuit Theory</u></p> <p>Diode and Transistor Thyristor as switch its characteristic ,protection, triggering [circuit. [15 hrs.]</p> <p>AC circuits I –Single phase half wave and full wave Rectifier . [10 hrs]</p> <p>Revision problem classes [5 hrs]</p>

	<p style="text-align: right;"><u>Part B Applications</u></p> <p>dc-dc converter ,stepdown and step up chopper. [15 hrs]</p> <p>Single phase and three phase inverters. [15 hrs]</p> <p>Applications oof power Electronics UPS.SMPS and Health car application. [10 hrs]</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>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.</p>

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		

Module Evaluation					
تقييم المادة الدراسية					
As		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.	Λ	% (10)°1	Continuous	
	Report	1	% (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 Syllabus)	
المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to power electronics. Lect.1and 1a
Week 2	Switching devices, power & control device
Week 3	Types and characteristic, rating (diode, transistor ...).
Week 4	Methods of turning – on & turning – off.
Week 5	Protection of power devices.
Week 6	Triggering & base drive circuits. Controlled rectifiers, 1 – phase
Week 7	Mid-Exam
Week 8	Controlled Rectifier 3 – phase circuits
Week 9	Half – wave & full – wave circuits3 phase Rectifiers.
Week 10	D.C choppers; step – up & step – down choppers
Week 11	A.C phase controllers.
Week 12	Invertors, 1 – phase & 3 – phase bridges
Week 13	Some applications: a – uninterruptible power supply UPS).
Week 14	switching mode power supply (SMPS)
Week 15	Application of power Electronics in medical instruments Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	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.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Power Electronics By Lander	Yes
Recommended Texts	Power Electronics and drive By Mohmmmed T.Lazim	No
Websites	M.T.Lazim	

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	Python Programming		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MIET٣٢٠٦		
ECTS Credits	٤		
SWL (hr/sem)	١٠٠		
Module Level	UGIII؟؟؟؟؟؟	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Osama Abbas Hussein	e-mail	Osama.abbas@mtu.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Zina Ahmad	e-mail	zena@mtu.edu.iq
Peer Reviewer Name	Dr.Aws Alazawi	e-mail	aws_basil@mtu.edu.iq
Scientific Committee Approval Date	13/10/2023	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	16. Introduce students to the fundamental concepts and principles of Python programming language. 17. Develop students' proficiency in writing Python code and solving programming problems. 18. Familiarize students with essential programming constructs, such as variables, data types, control flow structures, and functions. 19. Provide students with a solid foundation in object-oriented programming (OOP) and its application in Python. 20. Enable students to work with various data structures and perform operations on them. 21. 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. <u>Part A: Introduction to Python and Basic Concepts (Estimated time: 10 hours)</u> Overview of Python programming language Installation and setup

	<p>Variables and data types</p> <p>Basic operators</p> <p>Input and output operations</p> <p><u>Part B: Control Flow and Functions (Estimated time: 10 hours)</u></p> <p>Conditional statements (if, else, elif)</p> <p>Loops and iterations (for loop, while loop)</p> <p>Functions and function arguments</p> <p>Recursion</p> <p><u>Part C: Data Structures and File Handling (Estimated time: 10 hours)</u></p> <p>Strings and string manipulation</p> <p>Lists and list manipulation</p> <p>Dictionaries and sets</p> <p>File handling and input/output operations</p> <p><u>Part D: Advanced Topics (Estimated time: 15 hours)</u></p> <p>Exception handling and error management</p> <p>Modules and packages</p> <p>Object-oriented programming (OOP) concepts</p> <p>Classes, objects, inheritance, and polymorphism</p> <p><u>Part E: Applications and Practical Projects (Estimated time: 15 hours)</u></p> <p>Working with files and directories</p> <p>GUI programming</p> <p>Web scraping</p> <p>Data manipulation and analysis</p>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>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 also play vital roles in fostering student engagement and understanding. It is important to promote a growth mindset, encourage critical thinking, and create opportunities for</p>

	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 أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	21	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

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

Week	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.

المرحلة الرابعة

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Medical Therapeutic Instrumentation I	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET4101		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	UGIV		
Administering Department	MIET	College	EETC
Module Leader	Luban Hamdy Hameed	e-mail	Luban_alqudsi@mtu.edu.iq
Module Leader's Acad. Title	Assistant Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor			
Peer Reviewer Name	Amal Ibrahim Mahmood	e-mail	Aml.alzubedy@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. The graduated students will acquire the theoretical concepts behind medical therapeutic instruments. 2. The graduates get the scientific and applied skills to diagnosis the medical 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>General systems and specialized tools in general surgery [9 hrs].</p> <p>Surgical diathermy, cautery [8 hrs].</p> <p>Dental chair [10 hrs].</p> <p>Ophthalmic microsurgical Inst. [9 hrs].</p> <p>Heart – lung machine [10 hrs].</p> <p>Hemodialysis machine [9 hrs].</p>

	Therapeutic Diathermy [12 hrs].
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>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.</p> <p>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.</p>

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	96	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
As		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 الاسبوعي النظري	
Week	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	
Week	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
<p>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.</p>				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Medical Laser Systems		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET4102			
ECTS Credits	5			
SWL (hr/sem)	125			
Module Level	UG IV	Semester of Delivery		7
Administering Department	MIET	College	EETC	
Module Leader	Dalya Hussein Abbas		e-mail	dalya@mtu.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.	
Module Tutor	Ass. Lect. Sarah Amer Dawood		e-mail	Sarah.aldoori@mtu.edu.iq
Peer Reviewer Name	Assis. Prof. Dr. Ghaidaa Abdulrahman Khalid		e-mail	ghaidaakhalid@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	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	<ol style="list-style-type: none"> 1. Understand the nature of light and laser generation, including the introduction of the electromagnetic spectrum, absorption, and emission processes. 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	<ol style="list-style-type: none"> 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	<p>Light Nature and Laser Generation, Introduction of Electromagnetic Spectrum, Absorption and Emission, Laser Levels System, Properties of Laser Light. (7 hrs)</p> <p>Laser System Design (Active medium, Pumping Source as an Excitation Mechanism, Optical Resonator). (6 hrs)</p>

	<p>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)</p> <p>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)</p> <p>Laser Detectors (Quantum Detector, Vacuum Photodiode, and photomultiplier) (5 hrs)</p> <p>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)</p> <p>Laser Medical Application Categorization According to (Type of Laser, Type of Treatment, Organ) (3 hrs)</p> <p>Laser Medical Application in(Surgery, Dermatology, Ophthalmology, Dentistry, Oncology, Urology) (9 hrs)</p> <p>Laser Hazards; Understanding the Classification of laser hazard According to the Intensity. The Standard level for Safe Working Environments. (8 hrs)</p>
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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

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					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5,9	LO #4,#5,#6,and #7,
	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	
Week	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) المنهاج الاسبوعي للمختبر	
Week	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 Library?
Required Texts	An introduction to the Laser theory and applications By M. N. Avadhanulu and Dr. P. S. Hemne. Optical Fiber Communications By Gerd Keiser,second edition. Laser Principles and Applications By J.Wilson.	No Yes 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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Control System		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory x Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> 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	Prof. Dr. Ahmed R. Ajel	e-mail	Dr_ahmed.r@mtu.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Prof. Dr. jameel K.	e-mail	Dr_jameel57@mtu.edu.iq
Scientific Committee Approval Date	1/2023\8/	Version Number	.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

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>The module aims to:</p> <ol style="list-style-type: none"> 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<p>After completing this lecture, the student will be able to:</p> <ol style="list-style-type: none"> 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.

	<p>11. Be able to design and implement active control components such as PID 12. controllers to achieve desirable control objectives.</p> <p>13. Understand how control engineering sits within robotics system design and implementation.</p>
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>The indicative contents of control system module include:</p> <ol style="list-style-type: none"> 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.]
<p>Learning and Teaching Strategies</p> <p>استراتيجيات التعلم والتعليم</p>	
<p>Strategies</p>	<p>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:</p> <ol style="list-style-type: none"> 1. 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. 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. 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. 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 putting algorithms into practice.

	<p>To assist students in developing their problem-solving skills, instructors may offer comments and direction.</p> <p>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.</p> <p>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.</p> <p>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.</p>
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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					
As		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.	٨	% (10) ٥1	Continuous	All
	Report	١	% (10) ٥	14	LO # 1-14
Summative assessment	Midterm Exam	hours ٢	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	
Week	Material Covered
Week 1	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Mathematical background; modelling , application of mathematical modelling.
Week 3	<ul style="list-style-type: none"> Laplace transformation and inverse Laplace transform, partial fraction
Week 4	<ul style="list-style-type: none"> Block diagram representation for 1st and 2nd type
Week 5	<ul style="list-style-type: none"> Block diagram representation reduction, rules of minimizing block diagram.
Week 6	<ul style="list-style-type: none"> signal flow diagram.
Week 7	<ul style="list-style-type: none"> Mid-term exam
Week 8	<ul style="list-style-type: none"> Time domain analysis, for 1st , 2nd and higher order system
Week 9	<ul style="list-style-type: none"> Stability analysis; Routh, Nyquist Root locus technique
Week 10	<ul style="list-style-type: none"> Root locus technique design
Week 11	<ul style="list-style-type: none"> Frequency domain analysis, Gain margin, phase margin and bode plot.
Week 12	<ul style="list-style-type: none"> Frequency domain synthesis, phase lead
Week 13	<ul style="list-style-type: none"> Compensation, phase – lag compensation lag – lead compensation.
Week 14	<ul style="list-style-type: none"> PID controllers design.
Week 15	<ul style="list-style-type: none"> Preparatory week before the final Exam

Delivery Plan (Weekly Workshop Syllabus)	
المناهج الاسبوعي للورشة	
Week	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

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.				

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	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Biomedical Signal Processing		Module Delivery	
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET4104			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	UG IV	Semester of Delivery		7
Administering Department	MIET	College	EETC	
Module Leader	Aws Alazawi		e-mail	aws_basil@mtu.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor	Name (if available)		e-mail	e-mail
Peer Reviewer Name	Assis. Prof. Dr. Ghaidaa Abdulrahman Khalid		e-mail	ghaidaakhalid@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	Version Number	.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	<ul style="list-style-type: none"> ✓ 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	<p>By the end of the module, students should be able to:</p> <ul style="list-style-type: none"> ✓ 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	<ul style="list-style-type: none"> ✓ 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	<p>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 knowledge.</p>
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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					
As		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.	٤	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	
Week	Material Covered
Week 1	<ul style="list-style-type: none"> ✓ CHARACTERISTICS OF MEDICAL DATA ✓ PHYSIOLOGICAL SIGNALS ANALYZER ✓ MEDICAL CARE SYSTEM
Week 2	<ul style="list-style-type: none"> ✓ NATURE OF BIOMEDICAL SIGNALS ✓ SIGNAL ACQUISITION
Week 3	<u>RANDOM PHYSIOLOGICAL SIGNALS</u> <ul style="list-style-type: none"> ✓ SIGNAL AS STOCHASTIC PROCESS ✓ AVERAGING TECHNIQUES
Week 4	
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	
Week	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 Schaffer, 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.				

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Microcontrollers		Module Delivery	
Module Type	Elective I		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	MIET4106			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	UGx11 UGIV	Semester of Delivery		7
Administering Department	Type Dept. Code	College	Type College Code	
Module Leader	Dr. Sadik Kamel Gharghan		e-mail	sadik.gharghan@mtu.edu.iq
Module Leader's Acad. Title	Professor		Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)		e-mail	E-mail
Peer Reviewer Name	Prof. Dr. Ahmed Rashid Ajel		e-mail	dr_ahmed.R@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	Version Number	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p><u>Indicative Contents including the following:</u></p> <ul style="list-style-type: none"> - 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 programming skills and deepen their understanding of microcontrollers in medical applications. The module will incorporate classroom sessions, lectures, and hands-on laboratory 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

As		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	
Week	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	
Week	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 Weldon. 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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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Artificial Neural Engineering		Module Delivery
Module Type	Elective		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	MIET4107		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGIV	Semester of Delivery	
Administering Department	MIET	College	EETC
Module Leader	Jameel Kaduim Abed	e-mail	Dr_jameel57@mtu.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Prof. Dr. Sadik Kamel Gharghan	e-mail	sadik.gharghan@mtu.edu.iq
Scientific Committee Approval Date	8/11/2023	Version Number	.0\

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	MIET1206, MIET3102	Semester	UG I- S2 UG III – S5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>22. Introduce the biological inspiration of artificial neural network.</p> <p>23. List some of applications of artificial neural networks</p> <p>24. Introduce the simplified mathematical model of the neuron.</p> <p>25. Explain how these artificial neurons can be interconnected to form a variety of network architectures.</p> <p>26. Show how the architectures of artificial neural networks can be used to solve a practical problems.</p> <p>27. Show how to classify the learning rules as supervised, unsupervised and reinforcement learning rules.</p> <p>28. Introduce some of learning rules for classification, regression, clustering and prediction problems.</p>
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 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. <p>. In general the student will be able to read the problem requirements and how to design the neural network for this problem.</p> <p>. Using genetic algorithm for solution optimization.</p> <ol style="list-style-type: none"> 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
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ul style="list-style-type: none"> - 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 product , orthogonality , Norm , Gram-Schmidt Orthogonalization (3hrs). - Linear Transformations for Neural Networks: Linear Transformations, Matrix Representations, Change of Basis, Eigenvalues and Eigenvectors, Diagonalization (3hrs).

	<ul style="list-style-type: none"> - 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) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem)	36	Unstructured SWL (h/w)	2

الحمل الدراسي غير المنتظم للطالب خلال الفصل			الحمل الدراسي غير المنتظم للطالب أسبوعيا		
Total SWL (h/sem)		100			
الحمل الدراسي الكلي للطالب خلال الفصل					
Module Evaluation					
تقييم المادة الدراسية					
As		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	hr 4	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	<ul style="list-style-type: none"> - Introduction to the artificial intelligence - Machine learning
Week 2	<ul style="list-style-type: none"> - Perceptron learning rule
Week 3	<ul style="list-style-type: none"> - Supervised Hebb learning rule
Week 4	<ul style="list-style-type: none"> - Widrow – Hoff learning rule - Adaptive noise cancellation design using neural network
Week 5	<ul style="list-style-type: none"> - Multi- layer perceptron - Backpropagation learning rule
Week 6	<ul style="list-style-type: none"> - Variations of Backpropagation Algorithm
Week 7	<ul style="list-style-type: none"> - Mid Term
Week 8	Associative learning/ Kohonen self-organization
Week 9	<ul style="list-style-type: none"> - Competitive networks + Deep learning (Deep Recurrent Neural Network & Deep convolution Neural Network)
Week 10	<ul style="list-style-type: none"> - 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	
Week	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 – Marquartd 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
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