Republic of Iraq

Ministry of Higher Education and Scientific Research

University of Misan

College of Engineering

Department of Electrical Engineering

نماذج وصف المواد الدراسية لمقررات برنامج بكالوريوس الهندسة الكهربائية حسب مسار بولونيا للمرحلة الأولى والثانية للعام الدراسي 2024 - 2025

Module Description forms of the Modules of Bachelor of Science in Electrical Engineering Program according to Bologna Process

First and Second Year

2024-2025

MODULE DESCRIPTION FORM

Module Information					
Module Title	**Fundamentals of Electrical Engineering I**			**Module Delivery**	
Module Type	**C**			**√Theory** **√ Lecture** **√Lab** **√Tutorial** **☐ Practical** **☐ Seminar**	
Module Code	**EL 111**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	ONE	
Administering Department	Electrical Eng. Dep.		**College**	Engineering	
Module Leader	Dr. Jabbar Raheem Rashed		**e-mail**	dr.jabar72@uomisan.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	Ph.D	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. To deals with the basic concept of electrical circuit. 4. To understand Kirchhoff's current and voltage Laws problems. 5. To perform Mesh and Nodal analysis. 6. To apply Thevenin's , Norton's , superposition, maximum power transfer theorem to find different electric quantities.

Module Learning Outcomes	1- Describe electrical quantities such that: charge, current, voltage, power, energy, with List the various terms associated with electrical circuits. 2- Define Ohm's law and identify resistance of material and effect of temperature on the resistance. 3- Explain the two Kirchhoff's laws used in series and parallel circuit analysis. 4- Apply analysis method to series –parallel circuit. 5- Explain the mesh analysis in DC circuit with and without current source. 6- Explain the nodal analysis in DC circuit with and without voltage source. 7- Introduce superposition theorem to find the solution to network with two or more sources. . 8- Understanding Thevenin theorem to provide an equivalence circuit for any selected terminal of the circuit. . 9- Understanding Norton theorem to provide an equivalence circuit for any selected terminal of the circuit. 10- Use Thevenin theorem and Norton theorem to find maximum power transfer to the load. 11- Explain substation , reciprocal and Millman theorem.
Indicative Contents	Indicative content includes the following. **Part A - Circuits Analysis** DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. analysis of a circuit, Network reduction, Introduction to mesh and nodal analysis. [40 hrs] **Part B - Circuits Theorems** Superposition theorem, Thevenin theorem, Norton theorem, maximum power transfer theorem, millman theorem, substitution theorem, and reciprocal theorem. [20 hrs]

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

Student Workload (SWL)			
Structured SWL (h/sem)	109	**Structured SWL (h/w)**	7
Unstructured SWL (h/sem)	66	**Unstructured SWL (h/w)**	4.4
Total SWL (h/sem)	**175**		

Module Evaluation

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

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Basic concepts: system of units, charge, current, voltage, power, energy, circuit elements
Week 2	Resistance of conductors and temperature effects, temperature coefficient of resistance
Week 3	Basic laws: Ohm law, series resistance , Kirchhoff's voltage law and voltage divider.
Week 4	Basic laws:, parallel resistance Kirchhoff's current law and current divider.
Week 5	Basic laws, series – parallel network, ladder network, Star-delta connection..
Week 6	Methods of analysis: Mesh Analysis
Week 7	Methods of analysis: Mesh Analysis with special case
Week 8	Review + MID EXAM
Week 9	Methods of analysis: Nodal Analysis
Week 10	Methods of analysis: Nodal Analysis with special case
Week 11	Circuit theorems: superposition theorem, source transformation
Week 12	Circuit theorems: Thevenin theorem
Week 13	Circuit theorem : Norton's theorem
Week 14	Circuit theorem : Maximum power transfer theorem
Week 15	substitution theorem, reciprocal theorem and Millman's theorem
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Introduction: types of resistance and how to read its values, measurement instrument (Ammeter, voltmeter, ohmmeter) and how to connect them in the electric circuit
Week 2	Series , parallel, series – parallel connection
Week 3	Kirchhoff voltage law & Kirchhoff current low
Week 4	Superposition theorem
Week 5	Thevenin's Theorem
Week 6	Norton's Theorem
Week 7	Maximum Power Transfer

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Charles k. Alexander, and Matthew N.O. Sadiku, "Fundamentals of Electric Circuits"	yes
Recommended Texts	Boylestad, "Introductory Circuit Analysis"	yes
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Mathematics I			**Module Delivery**	
Module Type	**B**			☒**Theory** ☐**Lecture** ☐**Lab** ☒**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	EE112				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UGI	**Semester of Delivery**		One
Administering Department		Electrical Eng. Dep.	**College**		
Module Leader	Dr. Sinan Imad Sabri		**e-mail**	sisabri@uomisan.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Mathematics I aims to provide a comprehensive introduction to the mathematical concepts and techniques that are fundamental to study electrical engineering. During this course, students will develop a solid mathematical foundation that will support their understanding of advanced electrical engineering topics in subsequent semesters. The main module objectives are: 1. Introduce students to the basic mathematical concepts and notation. 2. Develop proficiency in algebraic manipulations and solving equations. 3. Introduce students to understand the concepts of sets, intervals and inequalities. 4. Provide an understanding of analytical geometry. 5. Provide an understanding of trigonometric functions and their applications. 6. Familiarize students with basic concepts of differentiation and the laws of differentiation on various mathematical functions. 7. Familiarize students with basic concepts in linear algebra.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students will be able to: 1. Understand the basic concepts related to this course. 2. Learn the concept of mathematical functions and related mathematical operations. 3. Understand how to represent mathematical functions and equations by drawing. 4. Understand trigonometric functions and their applications. 5. Learn the concept of differentiation and the laws of differentiation on various mathematical functions. 6. Understand how to apply differentiation to various engineering applications in general and applications related to Electrical Engineering in particular. 7. Understand some of the mathematical topics that needed to be understood to enter other courses in the Department of Electrical Engineering
Indicative Contents المحتويات الإرشادية	Introduction to calculus: • Equations and solution methods. • Elements and Sets. • Real Numbers and The Real Line. • Interval, Union and Intersections of intervals. • Inequalities. • Analytical Geometry, Distance between Points and Midpoint Formula. • Slope and Equation of Line. • Functions (Sums, Difference, Product and Quotients of Functions). • Domain and Range (Rf) of functions. • Composition of Functions:

	• Absolute Value Function. • Graph of Functions (Graph of Curves). • Shifting, Shrinking and Stretching of functions. • Trigonometric Functions Derivatives • Definition. • Derivatives by the Limits. • Laws of Derivatives. • Second and Higher Order Derivative. • Implicit Differentiation. • The quotient rule for Derivative. • The Chain Rule. • Derivative of Parametric Equations. • Derivative of Trigonometric Functions. • Applications of Derivatives. Matrices • Introduction to Matrices: Definition and notation of matrices, matrix elements, size or dimensions of a matrix, special types of matrices (square, rectangular, row vector, column vector), equality of matrices. • Matrix Operations: Addition and subtraction of matrices, scalar multiplication, matrix multiplication. • Matrix determinant. • Matrix Inverses. • Matrix transpose. • Systems of Linear Equations. • Cramer's rule. Limits and Continuity • Introduction. • Definition. • Properties of the Limits. • Right-hand limits and left-hand limits. • Limit Involving Infinity. • Continuous Function. • Algebraic properties of continuous functions.

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 in solving problems. This will be achieved

	through classes, interactive tutorials, homeworks and quizzes.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	4 and 6	LO #3, #4 and #5
	Assignments	4	20% (20)	3, 5, 9 and 12	LO #1, #2, #3, #4, #6, #7, #8, #10, and #11
	Projects / Lab.				
	Report	1	10% (10)	13	#6, #7, #8 and #9
Summative assessment	**Midterm Exam**	2 hr	10% (10)	10	LO #1 - #8
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to calculus, Equations and solution methods, Elements and Sets, Real Numbers and The Real Line, Interval, Union and Intersections of Intervals, and Inequalities.
Week 2	Analytical Geometry: Distance between points, Slope and equation of Line, Point Slope Equation, The Distance from Point to a Line, and Angles between two Lines.

Week 3	Assignment + Functions: Definition, Domain and Range of Functions, Absolute Value Function, The Greatest Integer Function, and Composition of Functions.
Week 4	Quiz + Graph of Functions: Symmetry Test for Graphs, Shifting, Shrinking and Stretching.
Week 5	Assignment + Trigonometric Functions: Definition and Identities of Trigonometric Functions, Graph of Trigonometric Functions.
Week 6	Quiz + Derivatives: Definition, Derivatives by the Limits, Laws of Derivatives, and Second and Higher Order Derivative
Week 7	Implicit Differentiation and the Quotient rule for Derivatives.
Week 8	The Chain Rule, Derivative of Parametric Equations, and Derivative of Trigonometric Functions.
Week 9	Assignment + Applications of Derivatives, Analysis of Functions: Increase and Decrease, Concavity and Inflection Points, Horizontal and Vertical Asymptotes, and Oblique Asymptotes
Week 10	Mid Term + Matrices: Introduction to Matrices: Definition and notation of matrices, matrix elements, dimensions of a matrix, special types of matrices (square, rectangular, row vector, column vector)
Week 11	Matrices: equality of matrices, Matrix Operations: Addition and subtraction of matrices, scalar multiplication, matrix multiplication, Matrix determinant, Matrix Inverses, Matrix transpose.
Week 12	Assignment + Matrices: Systems of Linear Equations and Cramer's rule.
Week 13	Report + Limits and Continuity: Introduction, Definition, and Properties of the Limits.
Week 14	Right-hand limits and left-hand limits, Limit Involving Infinity, Continuous Function, and Algebraic properties of continuous functions.
Week 15	**Review and solve related problems.**
Week 16	**Preparatory week before the final Exam**

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

Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	GEORGE B. THOMAS, JR. " Calculus ", 14th edition, Cenveo® Publisher Services, 2018.	
Recommended Texts	Anthony Croft, Robert Davison, Martin Hargreaves, and James Flint "Engineering Mathematics, A Foundation for Electronic, Electrical ,Communications and Systems, Engineers", Pearson Education, 2017.	
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

Module Information					
Module Title	Basic physics			**Module Delivery**	
Module Type	B			☒Theory ☐Lecture ☐Lab ☐Tutorial ☐Practical ☐Seminar	
Module Code	EE113				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	1		**Semester of Delivery**	ONE	
Administering Department	Electrical Dep.		**College**	Engineering	
Module Leader	Dr.baqer obaid alnashy		**e-mail**	baqernano@uomisan.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	11/06/2023		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

Module Objectives	1. To introduce the fundamental concepts of physics which provide a foundation for further study of materials, structures, mechanics and electronics at a level necessary to commence an engineering degree programme. 2. To consolidate a common knowledge base and begin the development of a learning methodology appropriate to an engineering degree programme. 3. On successfully completing the module you will be able to... 4. Demonstrate understanding of the fundamentals of physics 5. Apply basic concepts in the analysis of mechanical, electrical and thermal problems
Module Learning Outcomes	Syllabus plan 1. Introduction – physical parameters; dimensions and units; scalar and vector quantities; measurements; conservation of energy 2. Statics – (including forces and moments) 3. Structure of matter 4. Thermal propertiesand heat transport 5. Electrical properties
Indicative Contents	Indicative content includes the following. Part A - Circuit Theory Electrical Circuits: AC Circuits: Kirchhoffs laws for AC circuits, Complex Reactance and Impedance, Series LCR Circuit: (1) Resonance (2) Power Dissipation (3) Quality Factor, (4) Band Width, Parallel LCR Circuit.. [15 hrs] Semiconductor Diodes: P and N type semiconductors, energy level diagram, conductivity and Mobility, Concept of Drift velocity, PN junction fabrication (simple idea), Barrier formation in PN Junction Diode, Static and Dynamic Resistance, Current flow mechanism in Forward and Reverse Biased Diode, Drift velocity, derivation for Barrier Potential, Barrier Width and current Step Junction. Two terminal device and their applications: (1) Rectifier Diode: Half- [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] waveRectifiers.center-tappedandbridgetypeFull-waveRectifiers,Calculation of Ripple Factor and Rectification Efficiency,L and C Filters (2) Zener Diode and Voltage Regulation, Principle and structure of LEDS, (2) Photo diode(3) SolarCell.. [15 hrs]

	Revision problem classes [6 hrs] Part B - Analogue Electronics Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs] Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs]

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

Student Workload (SWL)			
Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	62	**Unstructured SWL (h/w)**	4.1
Total SWL (h/sem)	**125**		

Module Evaluation

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

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Semiconductor introduction
Week 2	Energy band
Week 3	SI and Ge properties'
Week 4	Crystal structure of SI and Ge
Week 5	Mobility in Semiconductor
Week 6	Doping in Semiconductor
Week 7	Types of Semiconductor
Week 8	Drift and diffusions' current in semiconductor
Week 9	P-N junction characteristics
Week 10	diode
Week 11	Load line analysis for diode
Week 12	Diode models
Week 13	Type of diode
Week 14	Series and parallel diode configuration
Week 15	Gates of diode
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1. ElectronicdevicesandcircuitsR.L.Boylstad(PearsonIndia) 2. Electronic Principles- A.P.Malvino (Tata McGrawHill)	
Recommended Texts	3. Principles of Electronics- V. K. Mehta and Rohit Mehta (S. Chand Publication)	
Websites		

Grading Scheme

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

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	Computer Programming I			**Module Delivery**	
Module Type	S			☒Theory ☐ Lecture ☒Lab ☒Tutorial ☐ Practical ☐ Seminar	
Module Code	UM114				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	1		**Semester of Delivery**	One	
Administering Department	Electrical Dep.		**College**	Engineering	
Module Leader	Yasir Ali Khalid		**e-mail**	Yasseralnaimi6@uomisan.edu.iq	
Module Leader's Acad. Title	Asst. Lecturer		**Module Leader's Qualification**		
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. Identify the function of computer and computer hardware components. 2. Identify the factors that go into an individual or organizational decision on how to purchase computer equipment. 3. Identify how to maintain computer equipment and solve common problems relating to computer hardware. 4. To develop students' understanding of number systems and codes used in computing. 5. Identify how software and hardware work together to perform computing tasks and how software is developed and upgraded 6. Identify different types of software such as computer operating systems , general concepts relating to software categories, and the tasks to which each type of software is most suited or not suited. 6. To familiarize students with thinking and problem-solving techniques using algorithms and flowcharts. 7. To develop students' understanding of programming languages, syntax, and semantics such as c++.
Module Learning Outcomes	Students will learn: 1. Demonstrate an understanding of computer system architecture. 2. Design algorithms and flowcharts to solve computational problems. 3. Understand the syntax of the C++ programming language. 4. Apply programming language features, such as variables, data types, and control structures, to develop software solutions. 5. Write code that adheres to the syntax and semantics of the C++ programming language.
Indicative Contents	Indicative content includes the following: *Computer System Architecture*: computer system architecture, Input/output devices, CPU (Central Processing Unit), Memory types. *Number Systems and Coding*: Introduction to number systems: Binary, Decimal, Octal, and Hexadecimal, Coding schemes and their applications, Conversion between different number systems. *Computer Software Applications*: Operating systems (Windows) *Design an algorithms and flowcharts to solve computational problems:* *Principles of Programming in C++:* Introduction to programming in C++, Input/output instructions, Header files, constants , variables , data types and type modifiers *C++ Programming Operators:* Arithmetical operators, Logical and relational operators, Control flow and looping instructions

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

Student Workload (SWL)			
Structured SWL (h/sem)	64	Structured SWL (h/w)	4
Unstructured SWL (h/sem)	61	Unstructured SWL (h/w)	4
Total SWL (h/sem)	125		

Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #7, #6
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #7 and #8
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)	
	Material Covered
Week 1	**Principles of Computer System 1**: Introduction to Computer System, History of Computer Systems , Computer Features and Fundamentals , Computer Applications and usages.
Week 2	**Principles of Computer System 2**: Types of Computer Systems, Data and Information, Number Systems, Computer Components Parts.
Week 3	**Computer System Hardware 1:** Hardware Components, Input Devices, Output Devices, Central Processing Unit and GUI.
Week 4	**Computer System Hardware 2:** Storage Devices **,** Computer Memory, Register Memory, Cache Memory, Primary Memory, RAM, ROMs, Secondary Memory and Memory Units.
Week 5	**Computer System Software 1:** Introduction to System Software,

	Classifications of System Software , Definition of Computer Operating System, OS functions and OS goals
Week 6	**Computer System Software 2:** Classification of Computer Operating systems, Windows Operating System , Windows Installation Requirements, Desktop Components ,Start Menu, Task Bar, Folders and Files, Icons, Desktop Background and Control Panel.
Week 7	**Mid Term Exam**
Week 8	**Programming Hierarchy 1**: Algorithms
Week 9	**Programming Hierarchy 2:** Flowcharts
Week 10	**Computer Programming 1:** Introduction To Computer Programming, Programming in C++ Language, Basic Source Character Set for C++ Language, C++ Keywords and C++ Identifier Names.
Week 11	**Computer Programming 2:** C++ Data Types, Type Modifiers, C++Variables and Constant ,Basic Input/Output Operators And Standard Header Files
Week 12	**Quiz and Discussion.**

Week 13	**Computer Programming 3:** C++ Operators, Arithmetic Operators, Relational and Logical Operators, Bitwise Operators and Remainder Operators.
Week 14	**Computer Programming 4:** Notations, postfix and prefix Notations, "math's" Library, Exercises.
Week 15	Preparatory week before the final Exam
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1 & 2	Assembly and Maintenance of Computer System Components (Input and Output Devices, CPU, Memory Storage Devices, Motherboard, Cards)
Week 3&4	Windows Operating System Installation #1
Week 5&6	Windows Operating System #2
Week 7&8	C++ Compilers (Terminals) Interfaces, Menu Bars and Debagging Process.
Week 9&10	Syntax of C++ Programming Language, Libraries and Weekly Evaluation
Week 11&12	C++ Examples and Weekly evaluation
Week 13&14	C++ Examples and Weekly evaluation
Week 15	Final Exam

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Braunschweig, D. and Busbee, K. L. (2018). Programming Fundamentals – A Modular Structured Approach, 2nd Edition.	yes
Recommended Texts		
Websites		

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

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	Chemistry			**Module Delivery**	
Module Type	B			☒Theory ☐Lecture ☐Lab ☐Tutorial ☐Practical ☐Seminar	
Module Code	ENG126				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	1	**Semester of Delivery**	Two		
Administering Department	Electrical Dep.	**College**	Engineering		
Module Leader		**e-mail**			
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.		
Module Tutor		**e-mail**			
Peer Reviewer Name	Name	**e-mail**	E-mail		
Scientific Committee Approval Date	1/06/2023	**Version Number**	1.0		

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	To introduce and develop key concepts in physical chemistry, in particular those of importance in chemical engineering processes 6. To energy conservation in closed, open and reacting systems. 7. To Understand the phase behaviour of substances and how to use the phase rule. 8. Understand the concepts of chemical potential, ideal and non-ideal conditions, and activity coefficients. 9. Calculate changes in enthalpy, entropy, Gibbs' free energy, and equilibrium constants of chemical reactions. 10. To Understand the basic principles of electrochemistry. 11. To Understand the basic principles of the physical chemistry of interfaces.
Module Learning Outcomes	1- Understand conductance of electrolytes and their behavior 2-Describe strong and week ions and their conductance behavior 3-Calculate conductivity, resistance, and cell constant for electrolyte solutions 4-Understand principles of measuring conductivity using conductometric sensors. 5-Describe types of conductometric sensors and their applications 6-Use conductivity measurements to determine concentration of electrolyte solutions. 7-Define the degree of dissociation and calculate it for a given solution 8-Understand the effect of concentration, temperature, and pressure on dissociation of electrolyte solutions. 9- Define the transference number and relate it to mobility of ions in electrolyte solutions 10-Describe methods to measure transference number. 11- Understand concepts of oxidation and reduction and their relation to electron transfer 12- Identify oxidizing and reducing agents in chemical reactions 13-Apply the concept of oxidation and reduction to balance redox equations and predict spontaneous redox reactions.
Indicative Contents	Indicative content includes the following. Part A - Eleectric conductance in Electrolytes Electric conductance in electrolytes measures how well electrolytes conduct

	electricity. Factors affecting it include concentration, temperature and ionic mobility. It's measured in siemens (S) using a conductometer. Applications include determination of molar and equivalent conductance. [6 hrs] Measurements of Conductivity of Electrolytes: The measurement of conductivity of electrolytes involves the use of a conductometer to measure the flow of electric current through the solution. Conductivity is affected by factors such as concentration, temperature and the type and mobility of ions in the electrolyte. Conductivity measurements can be used to determine parameters such as molar conductance, equivalent conductance and ion concentration.: [6 hrs] The degree of dissociation of electrolytes in a solution is a measure of the extent to which they break down into ions. It can be determined experimentally by measuring the conductivity of a solution of known concentration and comparing it to the conductivity of a similar solution of a non-electrolyte. The degree of dissociation is affected by factors such as temperature, concentration, and the nature of the electrolyte. It is an important parameter in determining the properties and behavior of electrolyte solutions. [6hrs] Revision problem classes [3 hrs] Part B - Transference number of Ions The transference number of ions is a measure of the mobility of a particular ion in an electrolytic solution. It represents the fraction of the total electrical current carried by that ion. The transference number can be experimentally determined by measuring the current carried by a single type of ion in a solution of known concentration and comparing it to the total current carried by all ions in that solution. The transference number is dependent on factors such as the nature and concentration of the electrolyte, as well as the temperature and pressure. It is used in various fields, including electrochemistry and battery technology, to predict and control ion transport. [6 hrs] Oxidation and reduction reactions involve the transfer of electrons from one substance to another. Oxidation is the loss of electrons, while reduction is the gain of electrons. These reactions commonly involve the transfer of oxygen atoms or hydrogen atoms, hence the term "redox" (reduction-oxidation). Oxidation and reduction reactions are fundamental in many chemical and biological processes. Examples include combustion, photosynthesis, respiration, and corrosion. Oxidation and reduction reactions can be balanced using the half-reaction method, and can be detected using redox indicators and electrode potentials. [6 hrs]

Learning and Teaching Strategies

Strategies	Electrochemistry is a branch of chemistry that deals with the relationship between electricity and chemical reactions. This field of study has important applications in a variety of areas including energy generation, corrosion prevention, and chemical synthesis. Electrochemistry is essential in the development of technologies such as batteries, fuel cells and solar cells that generate electrical energy from chemical reactions. Another important application of electrochemistry is in corrosion science, where it is used to study and prevent the degradation of metals and other materials due to electrochemical reactions.

Student Workload (SWL)

Structured SWL (h/sem)	33	**Structured SWL (h/w)**	2.2
Unstructured SWL (h/sem)	42	**Unstructured SWL (h/w)**	2.8
Total SWL (h/sem)	**75**		

Module Evaluation

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

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction in Electrochemistry, Additionally, electrochemistry plays a vital role in the synthesis of materials
Week 2	Overall, electrochemistry is a fascinating field of study that has a wide range of applications and continues to be an active area of research and development.
Week 3	Electric conductance in electrolytes measures how well electrolytes conduct electricity. Factors affecting it include concentration, temperature and ionic mobility.
Week 4	The measurement of conductivity of electrolytes involves the use of a conductometer to measure the flow of electric current through the solution.
Week 5	Conductivity measurements can be used to determine parameters such as molar conductance, equivalent conductance and ion concentration.
Week 6	degree of dissociation of electrolytes in a solution is a measure of the extent to which they break down into ions.
Week 7	can be determined experimentally by measuring the conductivity of a solution of known concentration and comparing it to the conductivity of a similar solution of a non-electrolyte.
Week 8	The degree of dissociation is affected by factors such as temperature, concentration, and the nature of the electrolyte.
Week 9	It is an important parameter in determining the properties and behavior of electrolyte solutions.
Week 10	transference number of ions is a measure of the mobility of a particular ion in an electrolytic solution., It represents the fraction of the total electrical current carried by that ion.
Week 11	The transference number can be experimentally determined by measuring the current carried by a single type of ion in a solution of known concentration and comparing it to the total current carried by all ions in that solution.
Week 12	The transference number is dependent on factors such as the nature and concentration of the electrolyte, as well as the temperature and pressure. It is used in various fields.
Week 13	Oxidation and reduction reactions involve the transfer of electrons from one substance to another.
Week 14	Oxidation is the loss of electrons, while reduction is the gain of electrons. These reactions commonly involve the transfer of oxygen atoms or hydrogen atoms, hence the term "redox" (reduction-oxidation).
Week 15	Oxidation and reduction reactions are fundamental in many chemical and biological processes. Examples include combustion, photosynthesis,
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	1-The degree of Dissociation of Electrolytes in Solution: P. Atkins and J. de Paula, "Physical Chemistry," 11th ed. Oxford University Press, (2017), Electronic Principles- A.P.Malvino (Tata McGrawHill)	online
Recommended Texts	2- Physical Chemistry by Peter Atkins and Julio De Paula, Chapter 11, Oxford University Press, 2017, 3- Inorganic Chemistry by Catherine E. Housecroft and Alan G. Sharpe,	online
Websites	https://chem.libretexts.org/Courses/Athabasca_University/Chemistry_350%3A_Organic_Chemistry_I/10%3A_Organohalides/10.08%3A_Oxidation_and_Reduction_in_Organic_Chemistry.	

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

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	**Academic English**			**Module Delivery**	
Module Type	**S**			☒**Theory** ☐**Lecture** ☐**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UM116**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	Electrical Dep.		**College**	Engineering	
Module Leader	Hayder Naser Al-Lami		**e-mail**	hayderallami@uomisan.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	14. To enable the learner to communicate effectively and appropriately in real-life situations: 15. To use English effectively for study purposes across the curriculum; 16. To develop and integrate the use of the four language skills i.e. Reading, Listening, Speaking, and Writing;
Module Learning Outcomes	At the completion of the course, students will be able to: 1. Students will heighten their awareness of correct English grammar usage in all language skills. 2. Students will improve their speaking ability in English. 3. Students will review the grammatical forms of English and the use of these forms in specific communicative contexts, which include: class activities, homework assignments, reading of texts, and writing. 4. Students will improve their reading fluency skills. 5. Students will read university texts and expand their vocabulary. 6. Students will achieve these outcomes through the development of the following skills: focused reading skills work and exams; discussions of longer articles; and summary writing including the drafting process.
Indicative Contents	1. Introduction to the English language, and basic greetings. 2. Vocabulary building: Commonly academic used words, phrases, and expressions. 3. Grammar essentials: Nouns, verbs, adjectives, adverbs, tenses, and sentence structure. 4. Reading comprehension: Strategies for understanding and improving the reading text. 5. Writing skills: Sentence construction, punctuation paragraph development, and short essay writing. 6. Speaking skills: basic conversation practice. 7. Everyday communication: Practical English for social and functional situations.

Learning and Teaching Strategies	
Strategies	1. Encouraging students for learning by illustrating the importance of the English language in their studies and future career. 2. Motivate the spirit of competition between the students. 3. Use attractive visual examples to draw students' focus on the details. 4. Increasing the exercises at the points of weakness. 5. Maintain the ray of hope for the weak individuals through the stable opportunity to override failure.

Student Workload (SWL)			
Structured SWL (h/sem)	30	**Structured SWL (h/w)**	2
Unstructured SWL (h/sem)	17	**Unstructured SWL (h/w)**	1.3
Total SWL (h/sem)	**50**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	2 and 6	All
	Assignments	1	15% (15)	10	All
	Presentation	1	10% (10)	11	All
Summative assessment	**Midterm Exam**	2hr	15% (15)	7	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Basic English essentials
Week 2	Vocabulary enrichment and dictionary use
Week 3	English grammar
Week 4	English grammar
Week 5	English grammar
Week 6	Reading comprehension
Week 7	Mid-term exam
Week 8	Writing paragraph
Week 9	Writing paragraph
Week 10	Reading and writing.

Week 11	Basic conversation practice
Week 12	Basic conversation practice
Week 13	Reading practice
Week 14	Presentation
Week 15	**Presentation**
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Oxford English for Electrical and Mechanical Engineering Student's Book	
Recommended Texts	basic English language skills Oxbridge academy Headway Student's Book	
Websites	https://www.ted.com/talks https://www.perfect-english-grammar.com/the-method.html https://www.merriam-webster.com/	

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

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Workshop Technology			**Module Delivery**	
Module Type	Support			☐ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENG123				
ECTS Credits	2 ECTS				
SWL (hr/sem)	50				
Module Level		1	**Semester of Delivery**		2
Administering Department		Type Dept. Code	**College**	Type College Code	
Module Leader	Name		**e-mail**	E-mail	
Module Leader's Acad. Title			**Module Leader's Qualification**		
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Nabeel Najem Bahlool	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
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. Practical Skill Development: The primary aim of Workshop Technology is to develop practical skills among students. This includes acquiring hands-on experience in various workshop processes, such as machining, fitting, welding, carpentry, sheet metal work, and electrical work. 2. Understanding Workshop Tools and Equipment: Workshop Technology aims to familiarize students with different types of tools, machines, and equipment commonly used in workshops. Students learn about their purpose, operation, and maintenance, enabling them to work efficiently and safely. 3. Workshop Safety: Safety is a crucial aspect of workshop operations. The subject aims to educate students about workshop safety practices, including the proper use of personal protective equipment (PPE), handling hazardous materials, and following safety protocols to prevent accidents and injuries. 4. Material Selection and Handling: Workshop Technology focuses on the selection and handling of various materials used in workshops, such as metals, wood, plastics, and composites. Students learn about their properties, characteristics, and appropriate techniques for working with different materials. 5. Workshop Processes: The subject aims to introduce students to different workshop processes and techniques, such as machining, casting, forging, welding, soldering, brazing, and fabrication. Students learn the fundamentals of these processes, enabling them to carry out basic operations and understand their applications. 6. Measurement and Quality Control: Workshop Technology emphasizes the importance of accurate measurement and quality control in workshop operations. Students learn about different measuring tools and techniques, dimensional accuracy, tolerance, and inspection methods to ensure the quality of their work. 7. Project Work: Workshop Technology often includes project work or practical assignments, allowing students to apply their theoretical knowledge and skills to complete hands-on projects. This promotes problem-solving abilities, teamwork, and creativity. 8. Industry Relevance: The subject aims to bridge the gap between theoretical knowledge and industry practices. It strives to provide students with practical knowledge and skills that are relevant and applicable in real-world workshop environments, preparing them for careers in manufacturing, engineering, or related fields..
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students should be able to develop practical skills related to workshop processes, such as machining, fitting, welding, carpentry, sheet metal work, and electrical work. They should be proficient in using various tools, machines, and equipment commonly found in workshops. 2. Students should have a solid understanding of different workshop processes and techniques, including machining, casting, forging, welding, soldering, brazing, and fabrication. They should be familiar with the principles, applications, and limitations of these processes.

	3. Students should be aware of workshop safety practices and demonstrate the ability to work safely in a workshop environment. They should understand the importance of personal protective equipment (PPE), handling hazardous materials, and following safety protocols to prevent accidents and injuries. 4. Students should be knowledgeable about various materials used in workshops, such as metals, wood, plastics, and composites. They should understand their properties, characteristics, and appropriate techniques for working with different materials. 5. Students should be proficient in accurate measurement using different tools and techniques. They should understand dimensional accuracy, tolerance, and inspection methods to ensure the quality of their work. 6. Students should be able to analyze workshop-related problems and apply appropriate problem-solving techniques. They should demonstrate the ability to make informed decisions regarding workshop processes, tool selection, and material usage. 7. Students should be capable of planning and executing workshop projects. They should be able to apply their theoretical knowledge and practical skills to complete hands-on projects, meeting specified requirements and timelines. 8. Students should possess effective teamwork and communication skills, allowing them to collaborate with peers and effectively communicate ideas, instructions, and project progress in a workshop setting. 9. Students should understand the relevance of workshop technology in various industries and be able to relate theoretical concepts to real-world applications. They should be prepared for careers in manufacturing, engineering, or related fields. 10. Students should demonstrate ethical behavior, professionalism, and respect for intellectual property rights while working in a workshop environment. They should adhere to professional standards and regulations governing workshop practices.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduction to Workshop Technology: □ Overview of workshop practices and their significance in various industries. □ Workshop safety measures, including safety equipment and precautions. □ Introduction to common workshop tools, machines, and equipment. 2. Hand Tools and their Uses: □ Identification, selection, and proper use of hand tools used in workshop operations. □ Techniques for handling, maintaining, and storing hand tools. □ Hands-on practice with hand tools, such as hammers, chisels, screwdrivers, wrenches, etc. 3. Measuring and Marking Tools: □ Introduction to various measuring and marking tools, such as rulers, calipers, 4 micrometers, gauges, and levels. □ Principles of accurate measurement and marking techniques. □ Practical exercises on measuring and marking tasks. 4. Workshop Processes: □ Machining processes, including lathe work, drilling, milling, grinding, and shaping. □ Casting processes, such as sand casting and die casting.

	▯ Welding and joining techniques, like arc welding, gas welding, and soldering. ▯ Sheet metal work, including cutting, bending, and forming operations. ▯ Carpentry techniques, such as sawing, planing, and jointing. ▯ Introduction to electrical work, including wiring, soldering electrical connections, and basic circuitry. 6. Workshop Safety and Environmental Considerations: ▯ Importance of workshop safety and adherence to safety guidelines. ▯ Handling and disposal of hazardous materials and waste. ▯ Fire safety measures and emergency protocols. ▯ Environmental sustainability practices in workshop operations. 7. Quality Control and Inspection: ▯ Principles of quality control and assurance in workshop processes. ▯ Inspection techniques, including visual inspection, measurements, and non-destructive testing methods. ▯ Understanding tolerance, surface finish, and dimensional accuracy requirements. 8. Workshop Projects and Exercises: ▯ Practical projects and exercises to apply theoretical knowledge and develop practical skills. ▯ Project planning, execution, and documentation. ▯ Collaborative work and teamwork exercises. 9. Industry Practices and Career Orientation: ▯ Introduction to various industries and career opportunities related to workshop technology. ▯ Understanding industry standards, codes, and regulations. ▯ Work ethics, professionalism, and entrepreneurship in the workshop context.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Practical Demonstrations: Workshop Technology emphasizes practical demonstrations of workshop processes and techniques. Teachers or instructors demonstrate various operations using tools, machines, and equipment, allowing students to observe and understand the correct procedures. 2. Hands-on Workshops: Students actively participate in hands-on workshops where they perform various workshop tasks and operations themselves. This includes using tools, machines, and equipment to carry 5 out machining, fitting, welding, carpentry, and other relevant activities. Students gain practical experience and develop their skills through direct engagement. 3. Project-based Learning: Project-based learning is often incorporated into Workshop Technology. Students are assigned projects that require them to apply their theoretical knowledge and practical skills to complete specific tasks or create tangible outcomes. This approach promotes problem-solving, critical thinking, and teamwork.

	4. Collaborative Learning: Workshop Technology encourages collaborative learning where students work together in teams or groups. They collaborate on projects, share knowledge and expertise, and learn from each other's experiences. This fosters communication skills, teamwork, and the ability to collaborate effectively in a workshop environment. 5. Simulations and Virtual Labs: In some cases, virtual simulations or online virtual labs are used to supplement practical workshops. These interactive tools allow students to practice and experiment with workshop processes in a virtual environment, enhancing their understanding and skills before engaging in actual hands-on activities. 6. Multimedia Resources: The use of multimedia resources, such as videos, animations, and interactive presentations, can enhance learning in Workshop Technology. These resources provide visual demonstrations, explanations, and step-by-step instructions, helping students grasp complex concepts and procedures. 7. Field Visits and Industry Exposure: Organizing field visits to workshops, factories, or industrial sites can provide students with real-world exposure and a deeper understanding of workshop technology in practice. They can observe industry professionals in action, learn about advanced technologies, and gain insights into the application of workshop processes. 8. Assessment through Practical Tasks: Assessments in Workshop Technology often involve practical tasks and projects. Students are evaluated based on their ability to perform specific workshop operations, apply correct techniques, and produce quality work. This allows for a comprehensive assessment of their practical skills and knowledge. 9. Reflective Practices and Feedback: Students are encouraged to reflect on their own work, evaluate their strengths and areas for improvement, and seek feedback from instructors and peers. This reflective practice helps students identify their learning gaps and refine their skills for continuous improvement. 10. Safety Training and Demonstrations: Safety is a critical aspect of Workshop Technology. Students receive comprehensive safety training, including demonstrations and practice of safety procedures and the proper use of personal protective equipment. Regular safety reminders and discussions are integrated into the teaching process to ensure a safe workshop environment.

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

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Workshop Technology and Safety
Week 2	Workshop practices, tools, machines, and equipment
Week 3	Safety guidelines and procedures in the workshop environment
Week 4	Demonstration and practice of proper use of personal protective equipment
Week 5	Fire safety measures and emergency protocols
Week 6	Hand Tools and Measurement: Identification, selection, and use of hand tools
Week 7	Measurement techniques using measuring tools like rulers, calipers, and micrometers
Week 8	Hands-on practice with hand tools and measurement tasks
Week 9	Principles of accurate measurement and marking techniques
Week 10	Practical exercises on measuring and marking tasks
Week 11	Project Work and Review
Week 12	Collaborative project work integrating various workshop techniques and skills
Week 13	Collaborative project work integrating workshop techniques with chemical engineering concepts
Week 14	Review of learned concepts, techniques, and safety protocols
Week 15	Finalization and presentation of workshop projects
Week 16	Preparatory week before the final Exam.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	ورش الهندسية المرحلة الاولى 2024-2023 اعداد أ.عبد فارسالعزاوي	
Recommended Texts	ورش الهندسية المرحلة الاولى 2024-2023 اعداد أ.عبد فارسالعزاوي	
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

Module Information					
Module Title	**Fundamentals of Electrical Engineering II**			**Module Delivery**	
Module Type	**C**			√**Theory** √ **Lecture** √**Lab** √**Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EL 121**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	two	
Administering Department	Electrical Eng. Dep.		**College**	Engineering	
Module Leader	Dr. Jabbar Raheem Rashed		**e-mail**	dr.jabar72@uomisan.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	Ph.D	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	Fundamentals of Electrical Engineering I	**Semester**	1
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1- To develop problem solving skills and understanding of alternating waveform. 2- To understand meaning of voltage or current time- varying. 3- To deals with the sinusoidal current and phasor. 4- To introduce the concept of impedance and admittance of the circuit. 5- To understand Kirchhoff's current and voltage Laws problems. 6- To perform Mesh and Nodal analysis. 7- To apply Thevenin's , Norton's , superposition, maximum power transfer theorem to find different electric quantities. .

Module Learning Outcomes	1- Describe sinusoidal AC voltage characteristics and definitions . 2- Introduce general format of sinusoidal voltage and current. 3- Explain the phasor relation. 4- Understanding the terms: average value and effective (RMS) value. 5- Explain the response of R, L, and C elements to sinusoidal voltage and current. 6- Determine the average power and power factor 7- Solve the series , parallel and series – parallel AC circuit. 8- Explain the mesh analysis in AC circuit with and without current source. 9- Explain the nodal analysis in AC circuit with and without current source 10- Star-Delta and Delta-Star conversion 11- Introduce source conversion and superposition theorem to find the solution to network with two or more sources. . 12- Understanding Thevenin theorem to provide an equivalence circuit for any selected terminal of the circuit. . 13- Understanding Norton theorem to provide an equivalence circuit for any selected terminal of the circuit. 14- Use Thevenin theorem and Norton theorem to find maximum power transfer to the load. 15- Explain substation , reciprocal and Millman theorem. 16- Determine AC power, triangle power, and total P,Q, and S. 17- Understanding power factor correction
Indicative Contents	Indicative content includes the following. **Part A - Circuits Analysis** Definition of AC sinusoidal waveforms, phase relation, response of elements to sinusoidal voltage or current, series circuit, parallel circuit, Kirchhoff laws, mesh analysis, nodal analysis[40 hrs] **Part B - Circuits Theorems** Superposition theorem, Thevenin theorem, Norton theorem, maximum power transfer theorem, millman theorem, substitution theorem, and reciprocal theorem. [20 hrs]

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

Student Workload (SWL)			
Structured SWL (h/sem)	94	**Structured SWL (h/w)**	6.2
Unstructured SWL (h/sem)	56	**Unstructured SWL (h/w)**	3.8

Total SWL (h/sem)	150

Module Evaluation

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

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Basic concepts of AC circuit: definition, general format for sinusoidal voltage or current, phase relations,
Week 2	Average value , effective value, response of basic R, L, and C elements to a sinusoidal voltage or current.
Week 3	Series AC circuits , Kirchhoff's voltage law and voltage divider.
Week 4	Parallel resistance Kirchhoff's current law and current divider. Equivalent circuits
Week 5	Series – parallel network, ladder network, Star-delta connection.
Week 6	Methods of analysis: Mesh Analysis
Week 7	Methods of analysis: Mesh Analysis with special case
Week 8	Review + MID EXAM
Week 9	Methods of analysis: Nodal Analysis
Week 10	Methods of analysis: Nodal Analysis with special case
Week 11	Circuit theorems: superposition theorem, source transformation
Week 12	Circuit theorems: Thevenin theorem
Week 13	Circuit theorem : Norton's theorem
Week 14	Circuit theorem : Maximum power transfer theorem
Week 15	substitution theorem, reciprocal theorem and Millman's theorem, Power triangular
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	introduction: oscilloscope instrument and use it to display of alternating waveform and measurement of frequency, voltage, and phase shift.
Week 2	Response of pure R, L, and C elements to sinusoidal voltage
Week 3	Frequency response of series R-C circuit
Week 4	Frequency response of parallel R-l circuit
Week 5	Phase measurement by Lissajous pattern

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Charles k. Alexander, and Matthew N.O. Sadiku, "Fundamentals of Electric Circuits"	yes
Recommended Texts	Boylestad, "Introductory Circuit Analysis"	yes
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Mathematics II			**Module Delivery**	
Module Type	B			☒Theory ☐Lecture ☐Lab ☒Tutorial ☐Practical ☐Seminar	
Module Code	ENG124				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level		UGI	**Semester of Delivery**		Two
Administering Department		Electrical Eng. Dep.	**College**		
Module Leader	Dr. Sinan Imad Sabri		**e-mail**	sisabri@uomisan.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	EE112	**Semester**	One
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	Mathematics II aims to introduce students to the concept of integration and its importance to electrical engineering. Students will learn various integration methods, applications of definite integrals, and numerical integration. In addition to that, transcendental functions, complex numbers and polar coordinates will be covered in Mathematics II. The module objectives can be concluded as follow: 1. Introduce students to understand the concept of integration and how to solve related problems. 2. Identify different integration techniques and use them correctly to find the integrals of different functions. 3. Understand the effective methods of using integrals in problems related to electrical engineering applications. 4. Understand how to deal with complex numbers and use it with all associated mathematical operations 5. Familiarize students with the concepts of polar coordinates.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Students will be able to: 1. Understand the concept of integration and its importance in engineering applications. 2. Demonstrate proficiency in performing basic integration operations. 3. Apply integration techniques, including substitution, integration by parts, partial fractions, and trigonometric substitutions, to solve a variety of engineering problems. 4. Analyze and interpret the geometric and physical significance of definite integrals in the context of electrical engineering, such as computing areas and volumes. 5. Utilize numerical integration techniques, such as the trapezoidal rule and Simpson's rule, to approximate definite integrals in practical scenarios. 6. Perform arithmetic operations with complex numbers and find complex conjugates. 7. Convert equations between rectangular and polar forms.
Indicative Contents المحتويات الإرشادية	Indefinite Integrals • Rules for indefinite integrals • Integration of trigonometric functions • Solving Initial Value Problems with Indefinite Integrals • Definite Integrals • Rules for Definite Integrals Techniques of Integration • Basic Integration Formulas (by Substitution) • Integration by Parts • Tabular integration

	• Trigonometric Integrals • Definite integrals of odd and even functions • Integration by Trigonometric Substitutions • Integrating Rational Functions by Partial Fractions • Integration by substitution • Numerical integration (The Trapezoidal Rule and Simpson Rule) Application of Integrals: • Area under a curve • Finding the area between two curves • Volume of solids of revolution • Length of curves Transcendental Functions: • Inverse functions • Logarithmic functions Complex Numbers: • Complex numbers and operations • Graphical representation of complex numbers • Polar form of a complex number Polar Coordinates: • Definition of polar coordinates • Polar equations and graphs • Polar and cartesian coordinates • Graphing polar coordinate equations

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 in solving problems. This will be achieved through classes, interactive tutorials, homework and quizzes.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	4 and 6	LO #1, #2, #3, #4, and #5
	Assignments	4	20% (20)	3, 5, 7 and 15	LO #1, #2, #3, #4, # 5, #6, #12, #13, and #14
	Projects / Lab.				
	Report	1	10% (10)	13	#9, #10, and #11
Summative assessment	**Midterm Exam**	2 hr	10% (10)	8	LO #1 - #7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Integration: Indefinite Integrals, Rules for Indefinite Integrals, Integration of Trigonometric Functions.
Week 2	Solving Initial Value Problems with Indefinite Integrals, Definite Integrals, Rules for Definite Integrals.
Week 3	Assignment + Techniques of Integration, Basic Integration Formulas by Substitution, and Integration by Parts.
Week 4	Quiz + Tabular Integration, Trigonometric Integrals, and Definite Integrals of Odd and Even Functions.
Week 5	Assignment + Integration by Trigonometric Substitutions.
Week 6	Quiz + Integrating Rational Functions by Partial Fractions.

Week 7	Assignment + Integration by Substitution and Integrating of the Roots.
Week 8	Mid Term + Numerical integration: Trapezoidal Rule and Simpson Rule.
Week 9	Application of Integrals: Area Under a Curve and Finding Area between two Curves.
Week 10	Volume of Solids of Revolution.
Week 11	Length of Plane curves and Area of Surface of Revolution.
Week 12	Transcendental Functions: Inverse Functions and Logarithmic Functions.
Week 13	Report + Complex Numbers, Complex Numbers and Operations, Graphical Representation of Complex Numbers, and Polar Form of a Complex Number.
Week 14	Polar Coordinates: Definition of Polar Coordinates, Polar Equations and Graphs, Polar and Cartesian Coordinates, and Graphing Polar Coordinate Equations.
Week 15	Assignment + **Review and solve related problems.**
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	GEORGE B. THOMAS, JR. “ Calculus ”, 14th edition, Cenveo® Publisher Services, 2018.	
Recommended Texts	Anthony Croft, Robert Davison, Martin Hargreaves, and James Flint “Engineering Mathematics, A Foundation for Electronic, Electrical ,Communications and Systems, Engineers”, Pearson Education, 2017.	

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

Module Information					
Module Title	Computer Programming II			Module Delivery	
Module Type	C			☒Theory ☐ Lecture ☒Lab ☒Tutorial ☐ Practical ☐ Seminar	
Module Code	EL1256				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	2		Semester of Delivery	two	
Administering Department	Electrical Dep.		College	Engineering	
Module Leader	Yasir Ali Khalid		e-mail	Yasseralnaimi6@uomisan.edu.iq	
Module Leader's Acad. Title	Asst. Lecturer		Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number	1.0	

Relation with other Modules			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. Thorough treatment of problem-solving skills independent of c++ language 2. To develop students' understanding about the syntax, and semantics of selection and decision-making statements. 3. Introduce students to the concept of one-dimensional arrays. 4. Develop skills in declaring, initializing, and accessing elements in a 2D array. 5. Introduce the concept of function parameters and return values. 6. Extend students' knowledge of arrays by introducing multidimensional arrays. 7. Introduce the concept of pointers and references in programming. 8. Introduce students to the concept of strings and their manipulation in programming.
Module Learning Outcomes	1. Students will learn: 2. The fundamentals, the essential ideas, and the concepts for success in any c++ programming language. 3. How to write a computer program and learn how to get the computer to understand it. 4. Understand the concept of strings and their manipulation in programming. 5. Apply skills in declaring, initializing, and manipulating one-dimensional arrays. 6. Extend knowledge of 1D arrays by applying more advanced operations and algorithms. 7. Understand the concept of two-dimensional arrays. 8. Extend knowledge of 2D arrays by applying advanced operations and algorithms. 9. Understand the concept of function parameters and return values. 10. Understand the concept of multidimensional arrays and their applications. 11. Understand the concept of pointers and references in programming.
Indicative Contents	Introduction, The Rules of Programming Languages, Working with Data, Creating andNaming Variables. Using Variables and Operators, Choosing and Using Data Types, Applying Data Types,Creating Constants, Exploring Language Differences. Managing Program Flow, Making Choices and Conditions, Creating ComplexConditions, Creating Loops. Creating Functions, Returning Values and Using Parameters, Using Recursion. Creating and Using Composite Data Types. Arrays and Collections, Introducing Object-oriented Programming, Making Things Modular.

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

Student Workload (SWL)			
Structured SWL (h/sem)	64	**Structured SWL (h/w)**	4.2
Unstructured SWL (h/sem)	36	**Unstructured SWL (h/w)**	2.4
Total SWL (h/sem)	**100**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #7, #6
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #7 and #8
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)	
	Material Covered
Week 1	**Computer Programming 1**: Control Flow #1 / Selection Statements #1
Week 2	**Computer Programming 2**: Control Flow #2 / Selection Statements #2
Week 3	**Computer Programming 3**: Looping #1 / Decision Making Statements

	#1
Week 4	**Computer Programming 4:** Looping #2 / Decision Making Statements #2
Week 5	**Computer Programming 5:** Nested looping
Week 6	**Computer Programming 6:** One Dimensions Array
Week 7	**Computer Programming 7:** Two Dimensions Array
Week 8	**Mid Term Exam**

Week 9	**Computer Programming 8:** Function and Return Values
Week 10	**Computer Programming 9:** Function with Array
Week 11	**Computer Programming 10:** Pointer and References , Pointer with An Array
Week 12	**Computer Programming 11:** Strings, String Function
Week 13	Quiz and Discussion
Week 14	**Computer Programming 12:** Structure
Week 15	Preparatory week before the final Exam
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1 & 2	**Experiment No.1** : selection statements (control flow) , exercises , weekly evaluation
Week 3&4	**Experiment No.2** : decision making statements (looping), exercises , weekly evaluation
Week 5&6	**Experiment No.3** : decision making statements (nested loops)), exercises , weekly evaluation
Week 7&8	**Experiment No.4** :1D array and 2D array , exercises , weekly evaluation
Week 9&10	**Experiment No.5** :Functions , exercises , weekly evaluation
Week 11&12	**Experiment No.6** : Pointer and References , exercises , weekly evaluation
Week 13&14	**Experiment No.7** : String, exercises , weekly evaluation
Week 15	Final Exam

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Braunschweig, D. and Busbee, K. L. (2018). Programming Fundamentals – A Modular Structured Approach, 2nd Edition.	yes
Recommended Texts		

Websites	


Engineering College
2012
1432
جامعة ميسان
Misan University

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

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	**Mechanical Engineering**			**Module Delivery**	
Module Type	**B**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EE126**				
ECTS Credits	**2.00**				
SWL (hr/sem)	**50**				
Module Level	UGI		**Semester of Delivery**	1	
Administering Department	Electrical Eng. Dep.		**College**	Type College Code	
Module Leader	Hayder Naser Al-Lami		**e-mail**	hayderallami@uomisan.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. To apply the principles of mechanics to practical engineering problems. 2. To identify an appropriate structural system for studying a given problem and isolate it from its environment. 3. To teach safety rules and regulations on-site in an industrial environment and proper use of working tools, instruments, and machines. 4. To introduce basic workshop practices, production, labor, and time requirements of workshop operations. 5. To develop a simple mathematical model for engineering problems and carry out static analysis. 6. To carry out kinematic and kinetic analyses for particles and systems of particles.

Module Learning Outcomes	This course is essential in all engineering branches providing the students with the general basics of engineering science. by completing this course, students will be able:- 1- To understand how the world, both natural and man-made, works. 2- To understand physical principles, such as forces, motion, and equilibrium which has a crucial importance for any engineer. 3- To have a good knowledge of safety rules on-site in an industrial environment and increase the knowledge about the use of working tools, instruments, and machines. 4- To present a general guide for solving problems. 5- To show how to analyze systems of force. 6- To introduce the concept of free body diagram and equilibrium equation. 7- To present specific applications of frictional force analysis. 8- To study and classify the Kinematics and kinetics of particles and rigid bodies. 9- To know the basic of thermodynamics. 10- To know the basic of strength of materials
Indicative Contents	1- Static: Force system, force components, moment of a force, equilibrium, free body diagram, centroids and centre of gravity, centroids of area 2- Dynamics: Kinetics and Kinematics of particle, rectilinear motion, curvilinear motion 3- Workshop Skills The students are introduced to training programs in five workshops: Occupational safety and health, welding, measurement, drilling, and turning.

Learning and Teaching Strategies	
Strategies	1. Encouraging students for learning by illustrating the importance of Mechanical engineering in their studies and future career. 2. Motivate the spirit of competition between the students. 3. Use attractive visual examples to draw students' focus on the details. 4. Increasing the exercises at the points of weakness. 5. Maintain the ray of hope for the weak individuals through the stable opportunity to override failure.

Student Workload (SWL)			
Structured SWL (h/sem)	94	**Structured SWL (h/w)**	6
Unstructured SWL (h/sem)	31	**Unstructured SWL (h/w)**	2
Total SWL (h/sem)	**125**		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 6	All
	Homework	1	10% (10)	8	All
	Report	1	10% (10)	6	All
	Assignment on site	2	10% (10)	2, 4	
Summative assessment	Midterm Exam	2hr	10% (10)	7	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Introduction to mechanics: Basic Concepts, Scalars and Vectors, Newton's Laws, SI units, Problem Solving in Statics.
Week 2	Force systems: two- (Rectangular Components, Moment, Couple, Resultants)
Week 3	Force systems: two- (Rectangular Components, Moment, Couple, Resultants)
Week 4	Equilibrium: Free-Body Diagram
Week 5	Equilibrium: Free-Body Diagram
Week 6	Centroids and centre of gravity
Week 7	Mid-term exam
Week 8	Centroids of area
Week 9	Kinematics of Particles and rigid body
Week 10	Kinematics of Particles and rigid body
Week 11	Kinetics of Particle and rigid body (Force and Acceleration)
Week 12	Kinetics of Particle and rigid body (Force and Acceleration)
Week 13	Kinetics of Particle and rigid body (Force and Acceleration)
Week 14	Kinetics of Particle and rigid body (Force and Acceleration)
Week 15	Kinetics of Particle and rigid body (Force and Acceleration)
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1	Workshop Occupational safety and health
	Workshop welding
Week 2	Workshop measurement
Week 3	Workshop drilling
Week 4	Workshop turning
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1. "Engineering Mechanics-Statics and Dynamics", R.C. Hibbeler, 14th edition 2. "Engineering Mechanics-Statics and Dynamics", J. L. Meriam and L. G. Kraige, 8th edition	
Recommended Texts	1. "Engineering Mechanics-Statics and Dynamics", R.C. Hibbeler, 14th edition 2. "Engineering Mechanics-Statics and Dynamics", J. L. Meriam and L. G. Kraige, 8th edition	
Websites		

Grading Scheme

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

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

MODULE DESCRIPTION FORM

Module Information					
Module Title	Engineering Drawing			**Module Delivery**	
Module Type	B			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENG128				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	1		**Semester of Delivery**	One	
Administering Department	Electrical Dep.		**College**	Engineering	
Module Leader	Haider Abdulkareem Raheem		**e-mail**	eng.haider992@gmail.com	
Module Leader's Acad. Title	Assist lecturer		**Module Leader's Qualification**	M.Sc	
Module Tutor	Haider Abdul kareem Raheem		**e-mail**	eng.haider992@gmail.com	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	8. Acquaintance the students with the fundamentals of drawing. 9. Introduce the basic and principles of technical drawings. 10. Enhance communication of engineering drawings and product design. 11. Develop students' inspiration skills of the geometric objects. 12. Develop a knowledge of both manual and computer generated engineering drawing. 13. Create, edit and print a variety of technical drawings using a CAD system.
Module Learning Outcomes	13. Understand and read the engineering drawing clearly. 14. communicate effectively in a modern technical environment. 15. Enhances Imagination to the geometric shapes. 16. construct and present quality engineering drawings in a well drafted manner. 17. present correct lettering, figures and dimensions to a defined style and standard. 18. produce detailed Electrical Engineering drawings using AutoCAD
Indicative Contents	**Part A - Sketching** (a) Paper size, Lettering & title blocks (b) Engineering operations. (c) Graphic geometry. (d)Orthographic projection (e) Isometric and oblique projection (f) Multi view ortho graphic projection in first and third angle projection. [20 hours] **Part B - Computer Aided Drafting** (a) Introduction to basic CAD concepts using AutoCAD. (b) Basic file management techniques. (c) Use and identify key components of the software relating to the 2D drawing environment. (d) Use the AutoCAD software co-ordinate system to aid accurate drawing. (e) Set up the drawing environment with the correct units in order to start producing drawings. (f) Use absolute/relative/polar X, Y co-ordinate system to produce basic measured objects through keyboard entry. (g) Use AutoCAD function keys. (h) Use hatch, text and simple dimensioning routines. (i) Basic editing and drawing commands. (j) Scale/load linetypes (k) Use a layering system and different line type styles and assign lineweights. (l) Create/edit basic block (m) Create isometric drawings in 2D AutoCAD (n) Use of polar and circle array (o) Introduction to dynamic blocks (p) Enhancing CAD drawings with text, symbols and blocks. (q) Transferring data using the Design Centre. (r) Create basic dimension styles to suit viewport scales. [20 hours] **Part C - Practical CAD drawing exercises** (a) Foundation detail (b) Auto CAD 2D practice drawing (c) Auto CAD 3D geometric layout and sections (d) AutoCAD Single Line Diagram Drawing (e) Electrical panel CAD drawing. [5 hours]

Learning and Teaching Strategies

Strategies	The student work will be assessed according to the module tasks. The excises in the drawing hall will be marked weekly. And the homework will be assessed next lecture. During both assessments the student will give the oral and written feedback in order to improve their skills. The final exam will be done at the end of the semester.

Student Workload (SWL)

Structured SWL (h/sem)	48	**Structured SWL (h/w)**	3.2
Unstructured SWL (h/sem)	52	**Unstructured SWL (h/w)**	3.4
Total SWL (h/sem)	**100**		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	10	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	20% (20)	Continuous	All
	Report	0	0% (0)	---	----
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)	
	Material Covered
Week 1	Introduction, Graphic Instruments and Their Use, Lettering
Week 2	Engineering operations.
Week 3	Graphic Geometry
Week 4	Multi View Ortho Graphic Projection in First and Third Angle Projection
Week 5	Multi View Ortho Graphic Projection in First and Third Angle Projection
Week 6	Multi View Ortho Graphic Projection in First and Third Angle Projection
Week 7	**Mid- term** + Dimensions
Week 8	Third View
Week 9	Isometric Drawing and Sketching
Week 10	Isometric Drawing and Sketching
Week 11	Isometric Drawing and Sketching
Week 12	Oblique Drawing
Week 13	Oblique Drawing
Week 14	Section of Isometric Drawing Sectional View
Week 15	Section of Isometric Drawing Sectional View
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	The use of CAD in engineering drawing. Description of menu Bar and toolbars. Drawing Ellipse, Rectangle.
Week 2	Drawing line, poly line, Ray, Circle, point, Arc, etc.
Week 3	CAD Electrical, Mechanical/ Special features.
Week 4	The use of various layers.
Week 5	Drawing electrical symbols on simple architectural plans.
Week 6	3-D Drawing, render.
Week 7	Orthogonal projections and sectional views.

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Abdul-Rasul AL Khafaf , "Engineering Drawing" ,Baghdad, 1990	Yes
Recommended Texts	K. Venkata Reddy, "Textbook of Engineering Drawing" Second Edition, BS Publications, 2008	No, Only Websites Download Link Below
Websites	https://ia600107.us.archive.org/18/items/TextbookOfEngineeringDrawing_201802/Textbook%20of%20Engineering%20Drawing.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	democracy and human rights			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOM 121				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	**2**	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Assis.Lec.		**Module Leader's Qualification**	Master	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1-To gain an understanding of the philosophic and political backgrounds that underpin the concept of human rights, enabling students to grasp the multifaceted nature of this complex field. 2-To learn about the significant historical documents that have contributed to the development and formation of human rights theories, enriching their knowledge of the history and evolution of human rights. 3-To engage in critical examination and discussion of current political and ethical debates surrounding human rights, fostering critical thinking and encouraging students to form their own perspectives on these issues. 4-To study key legal documents and understand the work of crucial governmental and non-governmental institutions currently involved in the protection and promotion of human rights. This objective aims to make students aware of the global landscape of human rights protection and how it operates. 5-To undertake a detailed examination of at least one current problem area in human rights protection, providing a practical application of knowledge and giving students a deeper understanding of the complexities and challenges faced in human rights protection. 6-To promote an understanding and appreciation of the importance of human rights in all areas of life, including engineering, highlighting the significance of ethical considerations in technical professions. 7-To encourage students to consider how their future work as engineers could potentially impact human rights, fostering a sense of social responsibility and ethical awareness in their professional practice. 8-To cultivate skills in research, analysis, and argumentation related to human rights, thereby enhancing students' overall academic and intellectual skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the historical, philosophical, and political context of human rights, appreciating the complexities and dimensions of the concept. 2- Be familiar with significant historical documents and milestones that have contributed to the evolution of human rights theories and their role in shaping the current understanding of human rights. 3- Analyze and articulate positions on contemporary political and ethical debates about human rights, demonstrating critical thinking skills and a broad understanding of the issues. 4- Identify and understand the roles of major governmental and nongovernmental institutions in the promotion and protection of human rights, demonstrating an awareness of the broader global landscape of human rights advocacy. 5- Analyze a specific, current problem area in human rights protection, applying theoretical knowledge to real-world situations and demonstrating problem- solving skills. 6- Appreciate the relevance and importance of human rights considerations within their field of study, electrical engineering, and the broader engineering context. 7- Exhibit an understanding of the ethical responsibilities and potential impacts of engineering projects on human rights, preparing them to consider these factors in their future professional practice. 8- Show competence in researching, analyzing, and articulating arguments related to human rights, demonstrating development in academic skills applicable beyond this specific module.

	By achieving these learning outcomes, students will have not only a strong foundational understanding of human rights and its relevance to their discipline but also enhanced critical thinking and problem-solving skills.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. Introduces students to the philosophic and political background of the concept of human rights. 2. Discusses important documents as part of the history of the development of human rights theories. 3. Examines important issues in current political and ethical debates about human rights. 4. Reviews core legal documents and the work of the most important governmental and nongovernmental institutions currently involved in human rights protection and promotion. 5. Examines at least one current problem area in human rights protection

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures: Traditional lectures will be used to introduce fundamental concepts, providing students with a strong theoretical foundation in the philosophic and political backgrounds of human rights, the history of human rights theories, and the role of various institutions in human rights protection and promotion. 2. Interactive Discussions: To facilitate critical thinking and engagement, class sessions will often involve interactive discussions. These might revolve around the analysis of important historical documents, current debates on human rights issues, or case studies of specific problem areas in human rights protection. 3. Group Projects: Students will work in groups to analyze a specific problem in human rights protection, encouraging teamwork, fostering a deeper understanding of the issue, and enabling students to apply theoretical knowledge to practical scenarios. 4. Guest Lectures: Inviting practitioners from the field, such as human rights activists, legal professionals, or engineers working on ethical issues, can provide students with real-world insights and inspire them to consider the impact of their work on human rights. 5. Research Assignments: Individual or group assignments might require students to conduct research on a specific topic related to human rights. This encourages independent learning, develops research skills, and deepens their understanding of the subject. 6. Case Studies: By analyzing and discussing real-world cases in class, students can understand the practical application of human rights theories, grasp the challenges faced in human rights protection, and consider the relevance of these issues in their own field of study. 7. Online Resources: Making use of online resources, such as academic articles, video lectures, podcasts, or documentaries, can supplement the course material and offer different perspectives on the subject matter. 8. Reflection Papers: Students could write reflection papers on how they see human rights intersecting with their engineering studies and future careers, promoting introspection and ethical awareness. These strategies aim to promote an active learning environment where students can deeply engage with the subject matter, enhancing their understanding and fostering important skills such as critical thinking, teamwork, research, and communication.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
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	100		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مدخل عام الى مفهوم حقوق الانسان

Week 2	حقوق الانسان في الحضارات القديمة والشرائع السماوية
Week 3	تطور فكرة حماية حقوق الانسان في العصر الحديث
Week 4	المجتمع الدولي وحقوق الانسان
Week 5	اليات الامم المتحدة لحماية حقوق الانسان
Week 6	واجبات الانسان والقيود الواردة على ممارسة حقوق الانسان
Week 7	المنظمات والهيئات الدولية المعنية بحماية حقوق الانسان
Week 8	اخلاقيات المهنة تعليمات انضباط الطلبة في مؤسسات التعليم العالي رقم ١٦٠ لسنة ٢٠٠٧
Week 9	مفهوم وتاريخ الديمقراطية
Week 10	سمات النظام الديمقراطي ومكوناته
Week 11	الدستور والديمقراطية
Week 12	العلاقة بين حقوق الانسان والديمقراطية
Week 13	ضمانات الحريات والحقوق العامة
Week 14	الديمقراطية المعاصرة
Week 15	شروط قيام الديمقراطية الدستورية
Week 16	Preparatory Week Before the Final Exam

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

Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		
Recommended Texts		
Websites		

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Arabic Language 1**			**Module Delivery**	
Module Type	**Basic**			☐ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOM 123**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level		1	**Semester of Delivery**		1
Administering Department		Type Dept. ELE	**College**	Type College Code	
Module Leader	Mohammed Abdhussain Mohammed		**e-mail**	Moh.albahadli@uomisan.edu.iq	
Module Leader's Acad. Title		Assist Lec	**Module Leader's Qualification**		Msc
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/09/2024	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		**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	ان الهدف من تدريس مادة اللغة العربية في هذا القسم هو الكفاءة اللغوية للطلبة وتمكينهم من التعبير عن أفكارهم ومشاريعهم بلغة عربية فصيحة واضحة خالية من الغلط واللون العامي والاعجمي بأبسط الطرق . فاللغة هي أداة الايصال الأولى بين أفراد المجتمع ،ومتى تمكن الأنسان من لغته استطاع الوصول الى أذهان الآخرين بحيث يسهل تعامله معهم ويتمكن من تحقيق هدفه في العمل. وان ذلك يؤدي الى تحقيق التوازن المفترض في ثقافة الطلبة فهو يضمن نوعاً من التعادل بين مناهج المادة العلمية ووسيلة ايصالها او التعبير عنها .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	أ- الاهداف المعرفية . أ1- يتعلم الطالب خلال الفصل الدراسي بعض اساسيات مادة اللغة العربية . أ2- فهم تاريخ واساسيات نشأ قواعد اللغة العربية . أ3- يتعلم كيفية كتابة تقرير او بحث او طلب اجازة بدون اخطاء لغوية او كتابية . أ4- يتعلم الطالب كيفية كتابة الانشاء ومنها الى طريقة كتابة التقارير والبحوث العلمية : ب- الاهداف المهاراتية الخاصة بالموضوع : جعل الطالب قادرا على ان . ب1 - يتعلم كيفية كتابة انواع الهمزة سواء كانت همزة قطع او وصل وكيفية لفظها . ب2- يتعلم نبذة عن كتابة الهمزة سواء على الالف او الياء او الواو او مفردة على السطر . ب3- يفرق بين الظاء والضاد . ب4- يفرق بين التاء المربوطة والهاء
Indicative Contents المحتويات الإرشادية	

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	. د1- تمكين الطلبة من كتابة التقارير حول المواضيع الخاصة بجميع المواد وصياغتها بعيدا عن الاخطاء اللغوية . د2-تمكين الطلبة من كيفية استخدام المفردات الصحيحة وذلك من خلال الرجوع للقواميس . د3-رفع ثقة الطالب بنفسه من خلال خوض بعض المحادثات والمناظرات اللغوية ولا سيما الشعرية منها د4- تنمية مهارات الطلبة في كيفية التعامل مع مشاكل اللغة على الصعيدين اللفظي والكتابي وكيفية التعامل معها.

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

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	قواعد اللغة العربية : الكلام وما يتألف منه : الاسم ، والفعل والحرف الفعل واقسامه ، عالماته ، الفعل الماضي قواعد فعل الأمر ، الحرف وما يتميز به
Week 2	الفعل واقسامه ، عالماته ، الفعل الماضي
Week 3	قواعد فعل الأمر ، الحرف وما يتميز به

Week 4	الأعراب والبناء ، وعلاماته الأعراب ، والمثنى والملحق به
Week 5	ادب ، ونص شعري ، ودراسة وتحليل جمع المذكر السالم / والملحق به
Week 6	الملحقة بالأسماء الستة
Week 7	**امتحان نصف الفصل**
Week 8	المبتدأ والخبر ، انواع المبتدأ واحكامه
Week 9	قواعد : الخبر ، تعريفه وانواعه اختبار يومي
Week 10	أملاء : قواعد كتابه الهمزة
Week 11	ادب : نص نثري . دراسة وتحليل
Week 12	قواعد : اغلاط لغوية شائعة
Week 13	أملاء : قواعد كتابه الألف في نهاية الكلمة
Week 14	محاضرة عامه ومناقشات
Week 15	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	شرح ابن عقيل على الفية ابن مالك .بيروت دار الكتب العامة 1985 ، تحقيق محي الدين عبد الحميد.	Yes
Recommended Texts	جامع الدروس العربية . بيروت دار الكتب العلمية 1984 . 1987، تأليف مصطفى - الغلاييني - اللغة العربية لغير أقسام الاختصاص .مؤسسه دار الكتب بغداد 1981 ، تأليف عبد القادر حسين أمين . والدكتور رشيد العبيدي	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

Module Information					
Module Title	**Electronic i**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EE123**				
ECTS Credits	5.00				
SWL (hr/sem)	125				
Module Level		UGI	**Semester of Delivery**		2
Administering Department		Electrical Eng. Dep.	**College**	Type College Code	
Module Leader	Anwer Jabbar Hasan		**e-mail**	anwer.jabbar@uomisan.edu.iq	
Module Leader's Acad. Title		Asst. Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. Understand the process of rectification to establish a dc level from a sinusoidal ac input. 2. Be able to predict the output response of a clipper and clamper diode configuration. 3. Become familiar with the basic construction and operation of the Bipolar Junction Transistor. 4. Be able to apply the proper biasing to insure operation in the active region. 5. Recognize and be able to explain the characteristics of an npn or pnp transistor. 6. Be able to determine the dc levels for the variety of important BJT configurations. 7. Understand how to measure the important voltage levels of a BJT transistor configuration and use them to determine whether the network is operating properly. 8. Become aware of the saturation and cutoff conditions of a BJT network and the expected voltage and current levels established by each condition.

	9. Become familiar with the construction and operating characteristics of Junction Field Effect (JFET), Metal-Oxide Semiconductor FET (MOSFET). 10. Be able to perform a dc analysis of JFET, MOSFET, and MESFET networks.
Module Learning Outcomes	1- Will be able to recognize types of diodes, explain basic terms related with diodes and tell the operating principle of diodes. 2- Recognizes types and the construction of diodes.Explains ideal diode, equivalent circuit and dc characteristic of a diode. 3- Tells the operating principles of diodes and zener diodes. 4- Will be able to analyze different diode circuits. 5- Recognizes half-wave, full-wave and bridge rectifier circuits and explains the operation of these circuits. 6- Recognizes clipping and clamping circuits, explains the operation of these circuits and analyses these circuits. 7- Analyzes and measures parameters in basic diode circuits. 8- Will be able to tell the structure and the operation of transistors and recognize the different types of transistors. 9- Recognizes the different configurations of circuits with transistors and the characteristics of these circuits and compares these circuits. 10- Analyzes transistor dc biasing. 11- Explains the operation of transistor dc biasing circuits.Will be able to explain different circuits with transistors.
Indicative Contents	1- Diodes circuits: Diode operation and i-v characteristics, Regions of operation, models, and limitations, Tunnel, Zener, Varicap, LED, Photo, Laser, Microwave diodes, Single diode circuits, the load line, Multi-diode circuits, Rectifiers, Clipping and clamping, Electronic gates, Diode logic (AND and OR functions). 2- Bipolar transistors and logic families: NPN and PNP transistor operation, i-v characteristics, Regions of operation, models, and limitation, Transfer characteristic of BJT with load resistor, Biasing for logic and amplifier applications, Logic level definitions. 3- MOS transistors and biasing: Field-effect transistor operation, i-v characteristics NMOS, Regions of operation, models, and limitations, Enhancement and depletion-mode devices, PMOS devices, Transfer characteristic of FET with load resistor, Biasing for logic and amplifier applications.

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

Student Workload (SWL)			
Structured SWL (h/sem)	64	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	61	**Unstructured SWL (h/w)**	4
Total SWL (h/sem)	**125**		

Module Evaluation					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	5% (10)	5, 9	All
	Homework	5	10% (10)	12	All
	Report	1	10% (10)	10	All
	Assignment on site	2	5% (10)	4, 11	
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Diode operation and i-v characteristics, Regions of operation, models, and limitations
Week 2	Tunnel, Zener, Varicap, LED, Photo, Laser, Microwave diodes, Single diode circuits
Week 3	Rectifiers, Clipping and clamping
Week 4	Electronic gates, Diode logic (AND and OR functions)
Week 5	(BJTs): Basic Construction, Active Region Operation, Common Base (CB) Configuration
Week 6	Transistor Amplification Action, Common Emitter (CE)Configuration, Common Collector (CC)Configuration, Common Bais (CB)Configuration
Week 7	DC Biasing Circuits of BJTs: Standard Biasing Circuits
Week 8	Mid-term exam
Week 9	Other Biasing Circuits, Bias Stabilization
Week 10	BJT Switching Circuits
Week 11	FETs: Basic Definitions, Junction Field-Effect Transistor (JFET)
Week 12	DC Biasing Circuits of JFETs
Week 13	MOSFETs: DEPLETION-TYPE MOSFET,

Week 14	ENHANCEMENT-TYPE MOSFET
Week 15	MOSFET Biasing
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

	Text	**Available in the Library?**
Required Texts	1. Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 9th Edition, Pearson Education	
Recommended Texts	Millman J and Halkias .C., Integrated Electronics, TMH, 2007	
Websites		

Grading Scheme

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Electrical Circuit I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EL211**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	**2**		**Semester of Delivery**	**Three**	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	**Al-hussein M. Jumaah Alturfi**		**e-mail**	E-mail:alhussein.m@uomisan.edu.iq	
Module Leader's Acad. Title	**Associate Professor**		**Module Leader's Qualification**	**Ph.D.**	
Module Tutor	**Al-hussein M. Jumaah Alturfi**		**e-mail**	E-mail: alhussein.m @uomisan.edu.iq	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
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. **Provide a explanation of the concept of Laplace transform.** 2. **Distinguish between the functions of Laplace transform and inverse Laplace transform.** 3. **Determine the Laplace transform of standard functions.** 4. **Understand what a transfer function is and how it is used.** 5. **Determine the system poles and zeros.** 6. **Understand the natural response of the system.** 7. **Understand and use effectively circuit element models in the s-domain.** 8. **Understand how to perform circuit analysis in the s-domain and how to transform the results back into the time domain.** 9. **Explain transient condition that may occur in a network.** 10. **Explain transient condition in an R–L and R-C series/parallel circuit.** 11. **Make a complete analysis of transient condition of R–C series circuit on sudden application of a DC voltage.** 12. **Distinguish between steady state condition and transient condition with respect to voltage and current in a R–L and R–C series circuit with DC excitation.** 13. **Derive expressions for current and voltage under transient condition in a R–L–C series circuit on sudden application of a DC excitation.** 14. **List the steps to find transient response of electrical networks using Laplace transform.** 15. **Write differential equations of circuit variables in time domain and convert them into Laplace transform form.** 16. **Determine transient response of R – C and R-L circuits using Laplace transform and appreciate the method.** 17. **Define the two-port network parameters.** 18. **Write in terms of matrix equation the two-port network parameters.** 19. **Calculate Z-parameters, Y-parameters h-parameters, ABCD-parameters of two-port networks.** 20. **Explain two-port reciprocal network and symmetrical network.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**At the end of this module, students will be able to:** 1. **Analyze electrical network parameter for different application.** 2. **Apply the Laplace transform to linear circuits and systems.** 3. **Understand and be able to calculate: - dynamic analysis of RLC-circuits in frequency domain - current, voltage and power in circuits.** 4. **Develop Laplace Transformed network for steady state and transient analysis.** 5. **A good basis for analysis of electrical and electronic components in electronics, electric power engineering.** 6. **Determine the elements required to network synthesis methods.** 7. **Calculate two port network parameters such as z, y, ABCD and h parameters for given electrical network.** 8. **Relate different two port network parameters.** 9. **Simplify the complex network such as cascade, parallel networks using fundamental two port network parameters.**

	10. Find the various driving point & transfer functions of two port network. **11.**
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **Part A: S- domain Circuit Analysis** **Definition of the Laplace Transform, Properties of the Laplace Transform, The Inverse Laplace Transform, Impedance and admittance in s-domain, circuit analysis in s-domain. [15 hrs]** **Part B: Transfer Function** **Definition of the transfer function, Poles and zeros of transfer functions, natural response and s-plane.** **Part C: The Transient Circuits** **RC, RL, RLC circuit in series and parallel and their complete response in time and s-domain. [15 hrs]** **Part D: Two-Port Networks** **Two-port networks, y-z-h and ABCD parameters, Parameter relationships y-z-h and ABCD parameters, Cascaded two-ports, Series and parallel connections of two-ports.**

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**63**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**4.2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**62**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**4.2**
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)	4,8,10, and 12	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	11	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1.5hr.	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Laplace Transform, Selected Function Laplace Transforms, Properties of Laplace Transform and pairs
Week 2	Laplace Inverse, Circuit Elements in S Domain
Week 3	Electrical Circuit Analysis Using Laplace Transform
Week 4	Introduction to Transfer Function, System Poles and Zeros, Electrical Circuit in Transfer Function
Week 5	S-Plane, Natural Response
Week 6	Introduction to The Transient Circuits, The Transient analysis of R-C circuit
Week 7	The Transient analysis of R-C circuit, The Transient analysis of R-L-C circuit
Week 8	Transient Analysis Using Laplace Transform
Week 9	Mid term
Week 10	Introduction to TWO-PORT NETWORKS, Input impedance, output impedance, voltage gain, current gain and power gain
Week 11	Admittance parameters, Impedance parameters
Week 12	Hybrid parameters, Transmission parameters
Week 13	Conditions for Reciprocity and Symmetry, Interrelationships between Two-Port Parameters
Week 14	Interconnection of Two-Port Networks
Week 15	Two-Port Network Functions, Some Special Two-Port Networks
Week 16	Preparatory week before the final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**Electric Circuits, James W. Nilsson, Susan A. Riedel, Pearson.** **Circuit Analysis: Theory and Practice, Allan H. Robbins and Wilhelm C. Miller**	
Recommended Texts	**Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education**	
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
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	F – Fail	راسب	(0-44)	Considerable amount of work required

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MODULE DESCRIPTION FORM

Module Information					
Module Title	**Electrical Machine I**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EL212**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level		UGI	**Semester of Delivery**		3
Administering Department		Electrical Eng. Dep.	**College**	Type College Code	
Module Leader	Khalid Waleed Nasser		**e-mail**	Khalid.Waleed @uomisan.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	The module aims to do the following: 1. To Understand the fundamental principles that govern the operation of electrical machines such as transformers, motors, and generators. 2. To develop the ability to analyze and design electrical machines by studying their construction, characteristics, and performance parameters. 3. To develop the ability of students to analyze the performance parameters of electrical machines, such as torque, power, efficiency, and voltage regulation. 4. To understand the control mechanisms and operational aspects of electrical

	machines, including speed control methods. 5. Electrical machines are integral parts of various systems, such as power generation, transmission, and industrial processes. Students should comprehend the integration and coordination of electrical machines within these systems.
Module Learning Outcomes	1. Understand working principles of DC generators, including the basic construction, essential components, such as the armature, field winding, brushes, and commutator. 2. Different types of DC generators are studied, including separately excited generators, shunt-wound generators, series-wound generators, and compound-wound generators. 3. Understand the efficiency of a DC generator and identifying different types of losses (copper, iron, mechanical, etc.) 4. Understand Armature reaction refers to the magnetic field distortion caused by the armature current and Commutation process. 5. Apply EMF equation to solve different type of generator circuit. 6. Ability to analysis and discus the various characteristics of DC generators, such as open-circuit characteristic, magnetization characteristic and load characteristic. 7. Understand the parallel operation of dc generator and determine the output to the load. 8. Analysis and determine motor's parameters such as back emf, torque, speed, and horsepower. 9. Analyzing the key characteristics of DC motors, such as torque-speed relationship, efficiency, and output power. 10. Understand the methods of controlling DC motors, such as armature voltage control and field weakening. 11. Understand the various methods and techniques of braking of dc motor. 12. Understand and apply various method of test machine calculations.
Indicative Contents	Indicative content includes the following • **Magnetization and introduction to DC machine.** Working principle of DC machines, calculation of energy, power, and torque in DC machines, construction of DC machines, • **DC Generator** Simple Loop Generator, Construction and Components of DC Generators, function of commutation, Type of armature windings (Lap and Wave Winding), Type of excitation connections, E.M.F. Equation of a Generator, Calculation of induced EMF, calculation of power, losses and efficiency in DC Generator, maximum efficiency • **Armature Reaction and Commutation** Armature Reaction, Analyse Demagnetizing and Cross-magnetizing conductor, Calculation of Demagnetizing and Cross- magnetizing Ampere-Turns Per Pole (AT/Pole), Compensating Windings, Commutation, Methods of Improving Commutation, Characteristics of D.C. Generators, Characteristics of Separately excited Generator, O.C.C. characteristics, Voltage Build-up of a Shunt Generator, No-load Curve for Self-excited Generator, Critical Speed, Critical resistance, Characteristics of series generator, Parallel Operation of Shunt Generators, Load sharing, Analysing and calculate out power in DC power plant.

	• **DC Motor** Motor Principle, Significance of the Back e.m.f. Voltage Equation of a Motor, Conditions for Maximum Power, motor Characteristics (Speed of a D.C. Motor), Torque (Armature Torque of a Motor, Shaft Torque), Characteristics of shunt, series, and compound motor, starting and electric braking of DC motor, Losses, Efficiency and Power stage. • **Control method** Factors Controlling Motor Speed, Control speed method, Speed Control of Shunt Motors and Speed Control of Series Motors. • **Testing of DC Machines** Swinburne's Test and Hopkinson's Test

Learning and Teaching Strategies

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

Student Workload (SWL)

Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4.2
Unstructured SWL (h/sem)	62	**Unstructured SWL (h/w)**	4.2
Total SWL (h/sem)	**100**		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	6, 11	All
	Homework	2	10% (10)	5, 13	All
	Report	1	10% (10)	8	All
	Assignment	1	10% (10)	15	All
Summative assessment	**Midterm Exam**	1 hr	10% (10)	8	All
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction, Construction of DC Machines
Week 2	Type of Generator, Armature Winding, EMF Equation
Week 3	Total Losses, Distribution of Power, Efficiency
Week 4	Armature Reaction, Compensating Windings, Commutation
Week 5	Commutation, Generator Characteristics
Week 6	O.C.C. characteristics, Voltage Build-up
Week 7	Series Generator Characteristics, Voltage regulation, Paralleling DC Generators
Week 8	Mid Term Exam
Week 9	DC Motor, Back EMF
Week 10	Speed, Torque, Characteristics
Week 11	Losses, Control method
Week 12	Speed Control of Shunt Motors
Week 13	Speed Control of Series Motors
Week 14	Starting, Braking
Week 15	Testing of DC Machines
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Electrical Technology, B.L. Theraja, Volume-II (AC & DC Machines)	YES
Recommended Texts	Principles of Electrical Machines By V. K. Mehta, Rohit Mehta	NO
Websites		

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

Module Information					
Module Title	**Mathematics III**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**ENG201**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	2		**Semester of Delivery**	2	
Administering Department	Electrical Eng. Dep.		**College**	Type College Code	
Module Leader	Haider Abdalkarem Rahem		**e-mail**	Hayder.a.kareem@uomisan.edu.iq	
Module Leader's Acad. Title	Asst. Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	**EE122**	**Semester**	2
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	This course, Mathematics III, is specifically designed for undergraduate students in the field of Electrical Engineering. After completing this module, students should have developed a clear understanding of the fundamental concepts of Mathematics and a range of skills allowing them to work effectively with the concepts. The basic concepts are: 1) **Vectors and Geometry of Space** such as the topics of scalars and vectors, component of a vector, rules of vector arithmetic, norm of a vector, normalizing of vectors, dot product, cross product, product of three or more vectors, and equations of lines in space, planes in 3-space. 2) **Vector-valued functions (Vector Functions)** such as the topics of limits and

	continuity, derivatives, forms of a curve equation in space, parametric representation, unit tangent and normal vectors, curvature, radius of curvature, motion along a curve, velocity, acceleration and speed, and normal and tangential components of acceleration. 3) **Partial Derivatives (Differentiations)** such as the topics of Function of two or more variables, limits and continuity, partial derivatives, partial derivatives of functions of two variables, partial derivatives of functions with more than two variables, the chain rule, the chain rule for derivatives, the chain rule for partial derivatives, directional derivatives and gradients, directional derivatives, the gradient, tangent plans and normal vectors, maxima and minima of functions of two variables, and Lagrange multipliers. 4) **Multiple integrals** such as the topics of Double integral, areas and volumes, double integral in polar coordinates, parametric surfaces, surface area, surface integrals, and evaluation of volume and triple integral.
Module Learning Outcomes	After completing this module, students should demonstrate competency in the following skills: 1) Be able to determine vectors addition, subtraction and multiplication. 2) Be able to understand the applications of the vectors such as force, velocity and acceleration. 3) Understand the concept of partial differential, partial derivative and directional derivative. 4) Be able to calculate gradient, divergence and derivative and understand their applications. 5) Calculate the linearization of functions and determine maxima, minima and saddle points 6) Be able to Determine areas and volumes of functions using multiple integration methods.
Indicative Contents	**Indicative contents (Course Outline) include the following: -** **(i) Vectors and Geometry of Space.** scalars and vectors, component of a vector, rules of vector arithmetic, norm of a vector, normalizing of vectors, dot product, cross product, product of three or more vectors, equations of lines in space, planes in 3-space. **(ii) Vector-valued functions (Vector Functions)** limits and continuity, derivatives, forms of a curve equation in space, parametric representation, unit tangent and normal vectors, curvature, radius of curvature, motion along a curve, velocity, acceleration and speed, normal and tangential components of acceleration. (iii) **Partial Derivatives (Differentiations)** Function of two or more variables, limits and continuity, partial derivatives, partial derivatives of functions of two variables, partial derivatives of functions with more than two variables, the chain rule, the chain rule for

	derivatives, the chain rule for partial derivatives, directional derivatives and gradients, directional derivatives, the gradient, tangent plans and normal vectors, maxima and minima of functions of two variables, Lagrange multipliers. **(iv) Multiple integrals** Double integral, areas and volumes, double integral in polar coordinates, parametric surfaces, surface area, surface integrals, evaluation of volume and triple integral.

Learning and Teaching Strategies

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

Student Workload (SWL)

Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4.2
Unstructured SWL (h/sem)	37	**Unstructured SWL (h/w)**	2.5
Total SWL (h/sem)	**125**		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	4, 10	All
	Assignments	2	20% (20)	5, 11	All
	Report			10	All
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	**Vectors and Geometry of Space** Scalars and vectors, component of a vector, rules of vector arithmetic, norm of a vector, normalizing

	of vectors.
Week 2	**Vectors and Geometry of Space** Dot product, Cross product.
Week 3	**Vectors and Geometry of Space** Product of three or more vectors
Week 4	**Vectors and Geometry of Space** Equations of lines in space, planes in 3-space.
Week 5	**Vector-valued functions (Vector Functions)** Limits and continuity, derivatives, forms of a curve equation in space
Week 6	**Vector-valued functions (Vector Functions)** parametric representation, unit tangent and normal vectors.
Week 7	**Vector-valued functions (Vector Functions)** Curvature, radius of curvature, motion along a curve, velocity, acceleration and speed
Week 8	Mid-term exam
Week 9	**Partial Derivatives (Differentiations)** Function of two or more variables, limits and continuity, partial derivatives.
Week 10	**Partial Derivatives (Differentiations)** partial derivatives of functions of two variables, partial derivatives of functions with more than two variables.
Week 11	**Partial Derivatives (Differentiations)** the chain rule for derivatives, the chain rule for partial derivatives, directional derivatives and gradients, directional derivatives, the gradient,
Week 12	**Partial Derivatives (Differentiations)** maxima and minima of functions of two variables, Lagrange multipliers.
Week 13	**Multiple integrals** Double integral, areas and volumes, double integral in polar coordinates
Week 14	**Multiple integrals** Parametric surfaces, surface area, surface integrals
Week 15	**Multiple integrals** Evaluation of volume and triple integral.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Thomas, G. B., Weir, M. D., Hass, J., Heil, C., & Behn, A. (2016). *Thomas' Calculus Early Transcendentals*. Pearson.	Yes
Recommended Texts		
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Electronics II**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EL213**				
ECTS Credits	**5.00**				
SWL (hr/sem)	**125**				
Module Level		UGII	**Semester of Delivery**		3
Administering Department		Electrical Eng. Dep.	**College**	Engineering College	
Module Leader	Nawar Sa'ad Alseelawi		**e-mail**	Nawar.alseelawi@uomisan.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	***The goal of this course is to establish a background on:*** - Amplifier design, specifically on MOSFET-based amplifiers used in discrete circuits and integrated circuits, namely the microelectronic circuits. - Some useful integrated circuit elements based on these two transistors will be introduced and analyzed - The course also aims to cover the differential and multistage amplifiers. - In this course also other two terminal devices like schottky diodes , power diodes and others are explained. - PnPn and other devices are decrypted and explained their operations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Identify the main circuit elements and draw a electronic circuit diagram corresponding to a physical combination of standard electronic components - explain the properties and operations of BJTs (bipolar junction transistors). express that BJT is a P-N junction circuit element and its terminals are called as Emitter, Base and Collector. polarize a BJT using two sources and calculates various current, voltage values and also the power dissipated in a transistor. - Definition of small signal in transistor. - Be able to know the amplifier configurations for both BJT and FET . - explain the properties and operations of FETs (field effect transistors) and explain the structure and types of JFETs. - Be able to draw the transfer characteristics curve and explains forward conduction using this curve. - Explain the differences between D-MOSFETs and JFETs, and also E-MOSFETs and JFETs and likeness between D-MOSFETs JFETs. - Be able to analyze both BJT and FET circuits an ac analysis and calculate voltage gain, current gain input impedance and output impedance. - Identify and analyze the differential and multistage amplifiers . - Other two terminal devices also explained for the students and they be able to use them in their life. - PnPn and other devices are desecrated like : Diac,GTO, and Triac.
Indicative Contents المحتويات الإرشادية	يتم كتابة المحتويات الارشادية للمادة حسب المثال ادناه ***Indicative content includes the following.*** ***<u>Part A -FET Analogue Electronics</u>*** Two types of FETs will be introduced: the junction field-effect transistor (JFET) and the metal-oxide-semiconductor field-effect transistor (MOSFET). The MOSFET category is further broken down into depletion and enhancement types, which are both described. The MOSFET transistor has become one of the most important devices used in the design and construction of integrated circuits for digital computers. ***<u>Part B –Differential and Multistage Amplifiers</u>*** Determining voltage gain of Multistage Amplifiers: Learner is introduced to the use of the dB unit as applied to represent gain of amplifiers and perform calculations for total gain of amplifiers connected in cascade and drawing equivalent circuits of amplifiers.

	Part C- Other Two-Terminal Devices Explained their circuit diagrams and operations. ***Part D- PnPn Devices*** Explained their circuit diagrams and operations.

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.2
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**	3	20% (20)	4,7, and 9	LO #1, #2 and #10, #11
	Assignments	3	5% (5)	3,6 and 11	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	5% (5)	14	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2 hrs	10% (10)	11	LO #1 - #7
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction of amplification with transistors
Week 2	FETs: Basic Definitions, Junction Field-Effect Transistor (JFET)
Week 3	DC Biasing Circuits of JFETs
Week 4	MOSFETs: DEPLETION-TYPE MOSFET,
Week 5	ENHANCEMENT-TYPE MOSFET
Week 6	MOSFET Biasing
Week 7	Differential Amplifiers
Week 8	Multistage Amplifiers
Week 9	Multistage Amplifiers
Week 10	Multistage Amplifiers
Week 11	**Mid-term exam**
Week 12	Other Two Terminal Devices
Week 13	Other Two Terminal Devices
Week 14	Other Two Terminal Devices
Week 15	PnPn Devices and Others
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction
Week 2	Diode characteristics
Week 3	Zener diode characteristics.
Week 4	P-N junction diode as half-wave rectifier.
Week 5	P-N junction diode as Full -wave rectifier.
Week 6	P-N junction diode as full -wave bridge rectifier.
Week 7	clipping and clamping circuits.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 9th Edition, Pearson Education / PHI, 2007.	*yes*
Recommended Texts	1.Millman J and Halkias .C., Integrated Electronics, TMH, 2007. 2. S. Salivahanan, N. Suresh Kumar and A. Vallavaraj, Electronic Devices and Circuits, 2 nd Edition, TMH, 2007. 29 3.David A. Bell, Electronic Devices & Circuits, 4th Ediion, PHI, 2007	*yes*
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

Module Information					
Module Title	Electromagnetic Fields I			**Module Delivery**	
Module Type	B			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	EL214				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Electrical Dep.		**College**	Engineering	
Module Leader	Thaar A.Kreem		**e-mail**	thaar_kareem@uomisan.edu.iq	
Module Leader's Acad. Title	Lecturer Dr.		**Module Leader's Qualification**	Ph. D.	
Module Tutor	Non		**e-mail**	E-mail	
Peer Reviewer Name	Non		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	Non	**Semester**	
Co-requisites module	Non	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	1) To understand the concepts of Electrostatics and their applications. 2) To apply vector calculus to understand the behavior of static electric fields in standard configurations. 3) To use their ability to manage the electromagnetic laws to, in simple situations, set up a computational model and perform the necessary calculations: select appropriate methods; make appropriate approximations; plausibility assesses the results. 4) To analyze how energy is stored and transported in an electrostatics field. 5) To understand the effect of materials on electric and magnetic fields. 6) Use their conceptual understanding of the electromagnetic laws in order to qualitatively describe the behavior of the solution to the problem. 7) Use their ability to manage the electromagnetic laws to, in simple situations, set up a computational model and perform the necessary calculations: select appropriate methods; make appropriate approximations; plausibility assess the results analyze how energy is stored and transported in an electromagnetic field. 8) Describe and analyze electromagnetic wave propagation in free-space. 9) To understand principles of propagation of uniform plane waves.
Module Learning Outcomes	1) Describe and understand the principle of the electrostatic fields, 2) Study and understand The Cartesian coordinate system, vector components and unit vectors, vector field, vector algebra, dot product, cross product circular cylindrical coordinate system, spherical coordinate system, transformation between coordinate systems 3) Discuss the application of Coulomb's law. 4) Study the electric field intensity, field of n point charges Field due to a continuous charge distribution; field of a line of charge Field of a sheet of charge, Field of a volume of charge. 5) Discuss the application of Gauss's Law and Maxwell's First Equation. 6) Recognize Applications of Gauss's law, Differential volume element, the divergence and Maxwell' first equation,. 7) Explain Electrostatic in Material Space, Current, Current Density and Conductors. 8) Identify the Laplace's Equations and their applications. 9) To identify the concepts of Magnetostatics and their applications. 10) To explain the concepts of Electromagnetic Fields, waves and wave a. propagation. 8) To understand The divergence theorem
Indicative Contents	The Cartesian coordinate system, vector components and unit vectors, vector field, vector algebra, dot product, cross product circular cylindrical coordinate system, spherical coordinate system, transformation between coordinate systems Coulomb's law, electric field intensity, field of n point charges Field due to a continuous charge distribution; field of a line of charge Field of a sheet of charge, Field of a volume of charge. Electric flux density, Gauss's law Applications of Gauss's law, Differential volume element, the divergence and Maxwell' first equation, The divergence theorem Energy expended in moving a point charge, potential difference and potential The potential field of a point charge, the potential field of a system of charges Potential gradient, the dipole, The dipole, energy density in electrostatic field

Learning and Teaching Strategies

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

Student Workload (SWL)

Structured SWL (h/sem)	48	**Structured SWL (h/w)**	3.2
Unstructured SWL (h/sem)	27	**Unstructured SWL (h/w)**	1.8
Total SWL (h/sem)	75		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5(10%)	Suddenly	2-11
	Assignments	2	5(10%)		6
	Projects / Lab.	-	10%		
	Report	-	10%		
Summative assessment	**Midterm Exam**		(10%)	12	1-5
	Final Exam		(50%)	16	1-11
Total assessment			(100%)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	The Cartesian coordinate system, vector components and unit vectors, vector field, vector algebra, dot product, cross product
Week 2	circular cylindrical coordinate system, spherical coordinate system,
Week 3	transformation between coordinate systems
Week 4	Coulomb's law, electric field intensity, field of n point charges
Week 5	Field due to a continuous charge distribution; field of a line of charge
Week 6	Field of a sheet of charge, Field of a volume of charge.
Week 7	Electric flux density, Gauss's law
Week 8	Applications of Gauss's law
Week 9	Differential volume element, the divergence and Maxwell' first equation
Week 10	The divergence theorem
Week 11	Energy expended in moving a point charge
Week 12	potential difference and potential
Week 13	The potential field of a point charge, the potential field of a system of charges
Week 14	Potential gradient, the dipole
Week 15	The dipole, energy density in electrostatic field
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	1- Mathihew N. O. Sadiku, "Elements of Electromagnetics" , 6th Edition, OXFORD UNIVERSITY PRESS, 2015. 2- William H. Hayt, Jr. . John A. Buck," Engineering Electromagnetics", 6th Edition, The McGraw Companies, 2001. 3- Joseph A. Edminister, Mahmood Nahvi, " Electromagnetics", 4th Edition, McGraw-Hill Education, 2014.	Online
Recommended Texts	1- Mathihew N. O. Sadiku, "Elements of Electromagnetics" , 6th Edition, OXFORD UNIVERSITY PRESS, 2015. 2- William H. Hayt, Jr. . John A. Buck," Engineering Electromagnetics", 6th Edition, The McGraw Companies, 2001.	Online
Websites		

Grading Scheme

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

LEVEL: UGII

Semester - 3:

5- EL215 - Computer Programming I

Module Information معلومات المادة الدراسية					
Module Title	**Computer Programming I**			**Module Delivery**	
Module Type	**C**			☒Theory ☐Lecture ☐Lab ☐Tutorial ☐Practical ☐Seminar	
Module Code	**EL215**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	UGII		**Semester of Delivery**		
Administering Department	ELE.ENG.DEPT		**College**	Engineering	
Module Leader	Assist.Lect. Ahmed Majed Althahabi		**e-mail**	ahmedmajed@uomisan.edu.iq	
Module Leader's Acad. Title	Assistant Lecturer		**Module Leader's Qualification**	Assist.Lect.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	6/8/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	**EL215**	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To Impart the Knowledge to the students with MATLAB software. [This enhances programming knowledge in Research and Development]. 2. To provide a working introduction to the Matlab technical computing environment. [Themes of data analysis, visualization, and programming]. 3. To introduce students the use of a high-level programming language, Matlab. [Scientific problem solving with applications and examples from Engineering]. 4. Ability to design scripts files in matlab with interactive Input and Output, utilizing arithmetic expression repetitions, decision making capabilities, analysing vectors and matrices. 5. Gain practical skills on programming using MATLAB. 6. To develop industry-standard software techniques to model and solve specific engineering problems using currently available programme, MATLAB, and Simulink
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	After successful completion of this module, students will be able to: • Undertake arithmetic on scalars, vectors and matrices. • Ability to design MATLAB scripts with interactive Input and Output. • Utilizing arithmetic expression repetitions, decision making statements, different operations on matrices. • Create 2D and 3D plots of mathematical functions and data. • Solve a number of various problems Graduate skills learning outcomes. • Write MATLAB functions and scripts to solve engineering problems in various fields. • Evaluate advanced modelling and analysis techniques for the solution of practical and complex design problems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Fundamentals of Programming**: This section provides an introduction to the essential concepts, principles, and techniques of programming. Students gain an understanding of the significance of programming, the role of programming languages, and the basic elements of a program. They also learn problem solving techniques and the process of designing and implementing algorithms. **Variables and Expressions**: This topic focuses on variables, including their 53 types and characteristics. Students learn how to declare variables, assign values to them, and manipulate them using expressions and operators. **Statements and Control Flow**: Students understanding the fundamental components of a program's logic and flow through statements. They explore different types of statements and conditional constructs used to make decisions and control the execution of a program. **Functions and Modularization**: This subject covers functions, including their definition and usage. Students learn about parameters, arguments, and how to

	create reusable code through function abstraction. They also explore the concept of return values and principles of function design. **Recursion and Iteration**: This topic explores techniques for repetition and solving complex problems. Students learn about recursion, where a function calls itself, and iteration using loops. They discover various types of loops and control statements to ensure efficient program flow.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Think-Pair-Share: Integrate think-pair-share activities where students individually think about a programming problem or concept, pair up with a classmate to discuss their ideas, and then share their thoughts with the larger class. This encourages critical thinking, collaboration, and active participation. **Case-Based Learning:** Present real-life case studies or scenarios that require students to analyze, design, and implement Python solutions. This promotes problem-solving skills, critical thinking, and the application of programming concepts to practical situations. **Code Review Sessions**: Conduct code review sessions where students present their code to the class, explaining their thought process and seeking feedback. This promotes critical thinking, analysis of code quality, and constructive feedback exchange. **Quizzes and Assessments**: Incorporate regular quizzes and assessments to assess students' understanding of Python concepts, syntax, and problem-solving skills.Use online platforms or interactive tools that provide immediate feedback to enhance engagement and promote self-assessment. **Group Projects**: Assign group projects that require students to collaborate on developing a Python application or solving a programming problem. This encourages teamwork, division of tasks, and coordination, while applying their programming skills. **Homework Assignments**: Assign regular programming exercises and projects as homework. Encourage students to actively apply the concepts learned in class to real-world scenarios. Provide constructive feedback on their submissions to promote improvement and reinforce learning.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
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)	37	**Unstructured SWL (h/w)**	2.4

الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعيا	
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	MATLAB basics - The MATLAB environment - Basic computer programming
Week 2	MATLAB basics - Variables and constants, operators and simple calculations
Week 3	MATLAB basics - Formulas and functions - MATLAB toolboxes
Week 4	MATLAB Matrices and Vectors - Matrix and linear algebra review - Vectors and matrices in MATLAB
Week 5	MATLAB Matrices and Vectors - Matrix operations and functions in MATLAB
Week 6	MATLAB programming - Algorithms and structures - MATLAB scripts and functions (m-files)
Week 7	MATLAB programming - Simple sequential algorithms - Control structures (if…then, loops)
Week 8	Mid Term Exam.
Week 9	MATLAB programming - Nested Loops Breaks, Repetition Structures: Nested Loops and the Break Statement
Week 10	MATLAB programming - Reading and writing data, file handling - Personalized

	functions - Toolbox structure
Week 11	**MATLAB graphic functions**
Week 12	**MATLAB Numerical simulations - Numerical methods and simulations**
Week 13	**Random number generation – Monte carlo methods**
Week 14	**Hands-on session Interactive hands-on-session where the whole class will develop one or more MATLAB scripts that solve an assigned problem**
Week 15	**Review and solving related problems.**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Experiment No. (1) Introduction to MATLAB, Starting and Quitting MATLAB , Desktop Tools, Basic Commands, Practical Exercises**
Week 2	**Experiment No. (2) Working with Matrices , Entering Matrix , Subscripts , Basic Matrix Functions , Practical Exercises**
Week 3	**Experiment No. (3) Expressions , Variable , Numbers , Arithmetic Operators , Functions , Practical Exercises**
Week 4	**Experiment No. (4) Relational and Logical Operations , Relational Operations , Logical Operation , Bitwise Operation , Logical Functions , Practical Exercises**
Week 5	**Experiment No. (5) Plotting Function , Creating a Plot Using Plot Function , Adding Plots to an Existing Graph , Multiple Plots in One Figure , Setting Axis Limits , Axis Labels and Titles , Input / Output of Variables (Numbers and Strings) , Practical Exercises**
Week 6	**Experiment No. (7) Flow Control (if , else , switch , for , while , nested loops)**
Week 7	**Experiment No. (8) MATLAB Simulink Basic , Starting Simulink , Basic Elements , Building a System , Gathering Blocks , Modifying the Blocks , Connecting the Blocks , Running Simulations**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	**1- MATLAB Handbook with Applications to Mathematics, Science, Engineering, and**	**yes**

	Finance Jose Miguel David Baez-Lopez, David Alfredo Baez Villegas **2- MATLAB Commands and Functions(Dr. Brian Vick) (Alfio Quarteroni • Fausto Saleri •Paola Gervasio) Scientific Computing with MATLAB and Octave** 3- **INTRODUCTION TO MATLAB FOR ENGINEERING STUDENTS David Houcque Northwestern University (version 1.2, August 2005)**	
Recommended Texts		
Websites	http://www.eng-tips.com/threadminder.cfm?pid=575 http://www.matlabtutorials.com/mathforum/ http://www.mathworks.in/matlabcentral/ http://www.cfd-online.com/Forums/tags/matlab.html http://diydrones.com/forum/topic/listForTag?tag=Matlab	

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 Technical I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code					
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	**UGII**	**Semester of Delivery**			
Administering Department	**Type Dept. Code**	**College**	Type College Code		
Module Leader	**Dr. Haider Khalaf Allamy**	**e-mail**	Haider.allamy@uomisan.edu.iq		
Module Leader's Acad. Title	**Lecturer**	**Module Leader's Qualification**	Ph.D.		
Module Tutor		**e-mail**			
Peer Reviewer Name		**e-mail**			
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	EL226	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1) To develop problem solving skills and understanding of Digital Systems through The application of techniques. 2) To understand Digital signals and the difference from Analogue signals. 3) To cover the basic concept of Boolean Algebra. 4) To establish the basic concepts of Digital Combinational Circuits Design.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1) Students should be able to explain about digital number systems. 2) Students should be able to explain about Logic circuits. 3) The student should be able to introduce the methods for simplifying Boolean expressions. 4) To introduce basic postulates of Boolean algebra and shows the correlation between Boolean expressions
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. -Introduction to Digital Techniques: Basic: **3 Hours** Digital Systems: Digital systems, Digital Signals, Analogue systems, Analogue signals, Examples -Definitions, System of Numbers: **12 Hours** General number formula: Binary, octal, decimal and hexadecimal numbers. Numbers Base Conversion: Arithmetic operations in different number system, complements, binary codes, BCD, Ex-3, Gray codes -Standard forms Digital Logic Gates: **12 Hours** Logic Gates: AND, OR, NOT, NAND, NOR, Exclusive–OR and Exclusive–NOR Implementations of Logic Functions using gates, NAND–NOR implementations – Multi level gate implementations- Multi output gate implementations. -Boolean Algebra: **6 Hours** Boolean Algebra, Basic definitions, basic theorem and properties, Boolean functions. -MINIMIZATION TECHNIQUES AND LOGIC GATES: **12 Hours** Minimization Techniques: Boolean postulates and laws– De-Morgan's Theorem - Principle of Duality - Boolean expression - Minimization of Boolean expressions –– Minterm – Maxterm - Sum of Products (SOP) – Product of Sums (POS) – Karnough's diagram, Karnaugh map: AND- OR implementation, don't care

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopt 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 achieve through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to Digital Techniques: Basic: Digital systems, Digital Signals, Analogue systems, Analogue signals, Examples.
Week 2	Definitions, System of Numbers: General number formula: Binary and octal numbers.
Week 3	Decimal and hexadecimal numbers.
Week 4	Numbers Base Conversion: Arithmetic operations in different number system.
Week 5	Complements, binary codes, BCD, Ex-3, Gray codes.
Week 6	Standard forms Digital Logic Gates: Logic Gates: AND, OR, NOT, NAND and NOR.

Week 7	Exclusive–OR and Exclusive–NOR Implementations of Logic Functions using gates>
Week 8	NAND–NOR implementations – Multi level gate implementations.
Week 9	Multi output gate implementations.
Week 10	Boolean Algebra: Boolean Algebra, Basic definitions, basic theorem and properties.
Week 11	Boolean functions.
Week 12	MINIMIZATION TECHNIQUES AND LOGIC GATES: Minimization Techniques: Boolean postulates and laws – De-Morgan's Theorem -Principle of Duality.
Week 13	Boolean expression - Minimization of Boolean expressions —Minterm – Maxterm.
Week 14	Sum of Products (SOP) – Product of Sums (POS) – Karnough's diagram.
Week 15	Karnaugh map: AND- OR implementation, don't care.
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thomas L. Floyd, Digital Fundamentals, 9th Edition	yes
Recommended Texts		
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Electrical Circuit II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EL221**				
ECTS Credits	**5**				
SWL (hr/sem)	125				
Module Level	**2**		**Semester of Delivery**	**Four**	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	**Al-hussein M. Jumaah Alturfi**		**e-mail**	E-mail: alhussein.m@uomisan.edu.iq	
Module Leader's Acad. Title	**Associate Professor**		**Module Leader's Qualification**	**Ph.D.**	
Module Tutor	**Al-hussein M. Jumaah Alturfi**		**e-mail**	E-mail: alhussein.m@uomisan.edu.iq	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
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. **Understand that a current-carrying conducting coil induces a current in another coil due to the magnetic field produced by the first coil.** 2. **Relate an induced emf to a rate of change of magnetic flux and to mutual inductance for two coils with equal number of turn.** 3. **Understand the physics behind mutually coupled circuits and how to analyze circuits containing mutually coupled inductors.** 4. **Understand how linear transformers work and how to analyze circuits containing them.** 5. **Understand how ideal transformers work and how to analyze circuits containing them.** 6. **Understand how ideal auto transformers work and know how to analyze them when used in a variety of circuits.** 7. **Explain the basic function of a filter circuit.** 8. **Distinguish between a passive filter and an active filter.** 9. **Classify passive filters and explain function of each type of filter.** 10. **Explain the parameters of a filter.** 11. **Make analysis of constant K-type or proto-type filters.** 12. **Solve problems on constant K-type filters.** 13. **Design different filters.** 14. **Understand the concept of Network synthesis.** 15. **Understand the concept of resonance in series RLC circuits.** 16. **Analyze the quality factor (Q) and its significance in resonant circuits.** 17. **Explore the relationship between bandwidth and half-power frequencies in resonant circuits.** 18. **Investigate the characteristics of resonance in parallel RLC circuits.** 19. **Comprehensive understanding of single-phase and 3-phase systems, enabling them to effectively analyze and work with various configurations and load conditions.**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**At the end of this module, students will be able to:** 1. **Define mutual inductance and coupling coefficient.** 2. **Explain the dot convention rule.** 3. **Determine the mutual inductance of inductors in series and parallel.** 4. **Demonstrate the refer to primary and secondary techniques to solve for voltages and currents of an ideal transformer.** 5. **Drive the transfer function and cutoff frequency of all passive filters.** 6. **Understand the benefit and characteristic of all passive filter.** 7. **Understand the concept of resonance in series RLC circuits.** 8. **Analyze the quality factor (Q) and its significance in resonant circuits.** 9. **Explore the relationship between bandwidth and half-power frequencies in resonant circuits.** 10. **Investigate the characteristics of resonance in parallel RLC circuits.** 11. **Analyze the characteristics and behavior of single-phase three-wire systems** 12. **Evaluating both balanced and unbalanced 3-phase systems with star and delta connections.**

	13. **Develop the ability to calculate power in 3-phase circuits.**
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **Part A: Coupling Circuits** **Magnetic coupling, coefficient of coupling, equivalent circuit's linear, ideal transformers, autotransformer. [15 hrs]** **Part B: Filters** **Constant k-filters, low pass and high pass, modern filter design, network transformations and all pass filters.** **Part C: Resonance in Ac Circuits** **Resonance in Series RLC Circuit, Quality Factor (Q), Bandwidth and Half-Power Frequencies, Resonance in Parallel RLC Circuit.** **Part D: Poly-phase Circuits** **Single-phase three wire system, 3-phase balance and unbalance systems with star and delta connections, power in 3-phase circuits.**

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**63**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**4.2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**62**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**4.2**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3,7,10 and 12	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	11	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	1.5hr.	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Self-Inductance, Coupled Inductor, Mutual Inductance
Week 2	Mutual Inductance between Two Coupled Inductors, Dot Convention, coefficient of coupling, Inductances in series and Parallel
Week 3	Linear Transformer, Ideal Transformer
Week 4	equivalent circuit's linear, ideal transformers, autotransformer
Week 5	Classification of Filters, Characteristic of Filters
Week 6	Constant-k Filter, modern filter design
Week 7	network transformations and all pass filters
Week 8	Mid-term
Week 9	Introduction to Resonance in Ac Circuits, Applications of Resonance
Week 10	Resonance in Series RLC Circuit
Week 11	Quality Factor (Q), Bandwidth and Half-Power Frequencies
Week 12	Resonance in Parallel RLC Circuit
Week 13	Single-phase three wire system.
Week 14	3-phase balance and unbalance systems with star and delta connections.
Week 15	power in 3-phase circuits.
Week 16	Preparatory week before the final Exam

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

Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. **Electric Circuits, James W. Nilsson, Susan A. Riedel, Pearson.** 2. **Circuit Analysis: Theory and Practice, Allan H. Robbins and Wilhelm C. Miller** 3. **Modern electronics Instrumentation and measurement techniques by Albert D. Helfrick And William D. Cooper**	
Recommended Texts	1. **Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education** 2. **A course in Electrical and electronics measurement and instrumentation by A.K.Sawhney, 2nd Edition by Dhanpatrai**	
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
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	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks 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

Module Information					
Module Title	**Electrical Machine II**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EL222**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	UGI		**Semester of Delivery**	4	
Administering Department	Electrical Eng. Dep.		**College**	college of Engineering	
Module Leader	Khalid Waleed Nasser		**e-mail**	Khalid.Waleed @uomisan.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor			**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	Electrical Machine I	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	The module aims to do the following: 1. To Understand the fundamental principles that govern the operation of electrical transformers including principle working, primary and secondary windings, and core materials. 2. Students will learn about various types of transformers, such as step-up, step-down, auto-transformers, and three-phase transformers. 3. Students will learn to analyze the electrical parameters and ratings of transformers, such as voltage ratios, power ratings, voltage regulation, and efficiency.

	4. Students will also learn transformer configurations and connections, such as delta-delta, delta-wye, and wye-wye connections. 5. Additionally, students will understand distribution transformers and calculate all-day efficiency.
Module Learning Outcomes	By the end of this module, students will be able to: 1. Understand the principles and functioning of transformers. This includes basic concepts such as transformer construction, magnetic circuits, electromagnetism, and transformer operation. 2. Comprehend the efficiency aspects associated with power transfer, losses, and voltage regulation. This knowledge is essential for designing and operating efficient electrical systems. 3. Understand different performance parameters, including voltage regulation, impedance, voltage drop, and power factor, helps in interpreting transformer specifications and evaluating their suitability for various applications. 4. Understand and analyze the ideal transformer, practical transformer on load, phasor diagram, and circuit elements for the transformer. 5. Analysis of magnetic leakage and resistance of the winding with an approximate equivalent circuit 6. Calculate regulation, percentage impedance, reactance, resistance, and approximate voltage drop. 7. Understand transformer tests such as open circuit and short circuit tests and calculate the constant parameters and total losses (iron and Cu losses) of the transformer circuit. 8. Analyze and understand the auto-transformer's saving of copper in the autotransformer. 9.Analyze the parallel operation of Single-Phase Transformers and comprehend the conditions for satisfactory parallel operation. 10.Analyze three-phase transformer connections and calculate the kVA rating, transformation ratio, efficiency, regulation, and rating power.
Indicative Contents	1. Principle of working of a transformer, E.M.F. Equation, Transformation ratio • Understanding the working principles of electric transformers by applying Faraday's and Lenz's laws and mutual induction • Studying construction and the type of transformer according to construction. • Understanding and applying the E.M.F. equation of the transformer circuit. 2. Ideal transformer, Practical transformer, phasor diagram, transformer on load • Studying the properties of ideal and practical transformers • Understand and analyze the phasor relationships of ideal and practical transformers by visualizing Voltage and Current Relationships. • Calculate the primary current and iron loss for an ideal transformer with no load. • Exploring the Functionality of Transformers on Load. • Analyzing the phasor diagram of a loading transformer at different loads such as resistive, inductive, and capacitive • Calculate and analyze primary current, power factor, and power dissipation. 3. Equivalent circuit, approximate voltage drops, percentage regulation • Studying transformer circuit elements such as leakage reactance and resistance of winding. • Analyze the exact and approximate circuits and calculate the equivalent elements referred to as secondary or primary. • studying the complete phasor diagram at leading, lagging, and unity power factors.

	• Driving and applying voltage regulation, regulation, per unit impedance, reactance, and resistance. 4. Total Losses, Efficiency • transformer losses, including iron and copper losses • Calculate efficiency at any load and find the condition of maximum efficiency. 5. Transformer Test • Open circuit test • Short circuit test 6. Auto transformer, Paralleling transformer • Analysing autotransformers and studying the saving of copper in autotransformers • Understanding parallel transformer configurations and studying the benefits and conditions of parallel connections • Analysing the equal and unequal voltage ratios of the two paralleling transformers 7. Three-phase transformer • Studying three-phase transformers and banks of three single-phase transformers. • studying the connections of a three-phase transformer and understanding the benefits of each connection. • Calculate losses, voltage drop, regulation, and per-unit impedance per phase.

Learning and Teaching Strategies	
Strategies	1. Lecture method: In this traditional strategy, the teacher presents information through verbal communication, supplemented with visual aids or demonstrations. 2. Active learning: Encourages student engagement through participation, discussion, and problem-solving activities rather than passive listening. 3. Flipped classroom: Students engage with instructional materials outside of class (e.g., watching videos, reading texts) and then use class time for activities, discussions, and personal interaction with the teacher. 4. Assessments: Implement regular formative assessments, such as quizzes, assignments, and in-class exercises, to evaluate students' understanding and progress. Provide constructive feedback to guide their learning and address any misconceptions. 5. Review Sessions: Before exams or major assessments, conduct review sessions to summarize key concepts, address common challenges, and provide additional practice problems. This helps consolidate knowledge and reinforces understanding 6. Mid-term Exam: Administer a mid-term exam to assess students' comprehension of the topics covered in the first half of the module. This exam can help identify areas that require further clarification or reinforcement. 7. Final Exam: Conduct a comprehensive final exam to assess students' overall understanding of the module's content. Design the exam to incorporate a variety of question formats, including theoretical concepts, problem-solving, and circuit analysis.

Student Workload (SWL)			
Structured SWL (h/sem)	94	**Structured SWL (h/w)**	6.2
Unstructured SWL (h/sem)	31	**Unstructured SWL (h/w)**	3
Total SWL (h/sem)	**125**		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	6, 11	All
	Homework	1	10% (10)	12	All
	Lab	1	10% (10)	14	All
	Assignment	1	10% (10)	15	All
Summative assessment	**Midterm Exam**	1 hr	10% (10)	8	All
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Principle of working of a transformer, Transformer type and construction, transformer action, Faraday's, and Lenz's law's
Week 2	E.M.F. Equation, general equation, voltage ratio, current ratio, power rating equations, volt per turn form general equation volt per turn in terms of power rating.
Week 3	Ideal transformer, Practical transformer on no load, phasor diagram
Week 4	Transformer on load, Phasor Diagram
Week 5	Equivalent circuit of the transformer, leakage reactance, equivalent resistances, reactance's, and impedances phasor diagrams
Week 6	Approximate voltage drops, Percentage regulation, Regulation calculation using voltage values
Week 7	Total Losses, Efficiency, losses in transformer, Equations of these losses relating to transformer variables as a function to frequency and voltage (eddy current loss and hysteresis loss)
Week 8	**Mid Term Exam**
Week 9	Transformer Test: Open circuit Test, Short circuit Test
Week 10	Regulation calculation using short and open circuit tests, Efficiency calculation using short and open circuit tests, Maximum efficiency
Week 11	All day Efficiency
Week 12	Auto transformers and their types

Week 13	Transformer polarity, Parallel operation of transformers
Week 14	Three-phase transformer
Week 15	Connection of three phase transformers
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Exploring the Essentials of DC Machine Lab
Week 2	No-load Characteristics (O.C.C.) of Separately Excited Dc Generator
Week 3	Study the Conditions for Build-up of a DC Shunt Generator
Week 4	Study of Load Characteristics of DC Shunt Generator
Week 5	Speed Control of Separately Excited Dc Motor
Week 6	Load Characteristics of Long Shunt DC Compound Motor
Week 7	Swinburn's Test

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Electrical Technology, B.L. Theraja, Volume-II (AC & DC Machines)	YES
Recommended Texts	Principles of Electrical Machines By V. K. Mehta, Rohit Mehta	NO
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Electronics III**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EL223**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		UGII	**Semester of Delivery**		4
Administering Department		Electrical Eng. Dept.	**College**	Engineering College	
Module Leader	Nawar Sa'ad Alseelawi		**e-mail**	Nawar.alseelawi@uomisan.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Electronic Circuit I	**Semester**	3
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	***The goal of this course is to establish a background on:*** - Frequency Response of BJT single stage and Multistage amplifiers. - Be able to know the effect of internal and external capacitance of an amplifier on the value of voltage gain and phase shift. - The course also aims know how to calculate the values of upper and lower frequencies for single stage and multistage amplifiers.. - In this course we define what is the feedback amplifiers and their types. - Power amplifiers are explained in many types.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Observe the amplitude and frequency responses of common amplification circuits. - Explain the characteristics and operation of low frequency and high frequency for analogue electronic circuits. - Design low and high frequency analogue electronic circuits using electronic mathematical models. - Students analyze and test different active circuits express the basic structure, properties and working principles of feedback circuit. - Design and analyze oscillator electronic circuits using electronic mathematical models. - Design and analyze power amplifier electronic circuits using electronic mathematical models.
Indicative Contents المحتويات الإرشادية	يتم كتابة المحتويات الارشادية للمادة حسب المثال ادناه ***Indicative content includes the following.*** ***<u>Part A – Frequency response</u>*** Explain the various modes(classes) of operation used in amplifiers; Calculate the Gain of amplifiers(single and multistage) using the appropriate equivalent circuits; Define bandwidth and sketch typical signal frequency curves (gain db. Against logarithmic frequency); Describe the characteristics and operation of a range of operational amplifiers incorporating resistor capacitor networks (types: integrator, ac coupled amplifier having a high pass frequency response); Calculate the mid band voltage gains and bandwidths of high-pass and low-pass operation amplifier circuits given typical component values. ***<u>Part B – Feedback Amplifier</u>*** There are two basic types of feedback in amplifiers positive feedback and negative Feedback When the feedback energy (voltage or current) is in phase with the input signal and thus aids it, it is called positive feedback. While negative feedback results in reduced overall voltage gain, a number of improvements are obtained, among them being: 1. Higher input impedance. 2. Lower output impedance. 3. Better stabilized voltage gain.4. Improved frequency response.5. Reduced noise. 6. More linear operation. ***<u>Part E – Power Amplifier</u>*** Power amplifiers are generally classified into five types: A, B, AB, and C for analog designs and class D for switching designs. This classification is based on the percentage of the input cycle for which the amplifier operates in its linear region.

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	20% (20)	4,7, and 9	LO #1, #2 and #10, #11
	Assignments	3	5% (5)	3,6 and 11	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	5% (5)	14	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2 hrs	10% (10)	10	LO #1 - #7
	Final Exam	3 hrs	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of Frequency Response in single stage amplifier
Week 2	Low Frequency Response
Week 3	Low Frequency Response
Week 4	High Frequency Response
Week 5	High Frequency Response
Week 6	Frequency Response in multistage amplifier
Week 7	Frequency Response in multistage amplifier
Week 8	Feedback Amplifiers (type1 and type 2)
Week 9	Feedback Amplifiers (type3 and type 4)
Week 10	Mid-term Exam
Week 11	Power amplifiers
Week 12	Power amplifiers
Week 13	Power amplifiers
Week 14	Power amplifiers
Week 15	Power amplifiers
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction
Week 2	Test a transistor (short) between terminals
Week 3	Test a transistor (open) between terminals
Week 4	ICBO/ICEO Test on a Test Transistor .
Week 5	DC gain (HFE) of a Transistor
Week 6	Input characteristics of BJT transistor
Week 7	Transistor as switch

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1. Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 9th Edition, Pearson Education / PHI, 2007.	*yes*
Recommended Texts	1.Millman J and Halkias .C., Integrated Electronics, TMH, 2007. 2. S. Salivahanan, N. Suresh Kumar and A. Vallavaraj, Electronic Devices and Circuits, 2 nd Edition, TMH, 2007. 29 3.David A. Bell, Electronic Devices & Circuits, 4th Ediion, PHI, 2007	*yes*
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

Module Information					
Module Title	**Electromagnetic Fields**			**Module Delivery**	
Module Type	**B**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EL224**				
ECTS Credits	**3**				
SWL (hr/sem)	***75***				
Module Level		2	**Semester of Delivery**		4
Administering Department		Electrical Dep.	**College**		Engineering
Module Leader	Thaar A,kareem		**e-mail**		thaar_kareem@uomisan.edu.iq
Module Leader's Acad. Title		Lecturer Dr.	**Module Leader's Qualification**		Ph. D.
Module Tutor	Non		**e-mail**		E-mail
Peer Reviewer Name		Non	**e-mail**		E-mail
Scientific Committee Approval Date			**Version Number**		1.0

Relation with other Modules			
Prerequisite module	Non	**Semester**	
Co-requisites module	Non	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	10) To understand the concepts of Electrostatics and their applications. 11) To apply vector calculus to understand the behavior of static electric fields in standard configurations. 12) To use their ability to manage the electromagnetic laws to, in simple situations, set up a computational model and perform the necessary calculations: select appropriate methods; make appropriate approximations; plausibility assesses the results. 13) To analyze how energy is stored and transported in an electrostatics field. 14) To understand the effect of materials on electric and magnetic fields. 15) Use their conceptual understanding of the electromagnetic laws in order to qualitatively describe the behavior of the solution to the problem. 16) Use their ability to manage the electromagnetic laws to, in simple situations, set up a computational model and perform the necessary calculations: select appropriate methods; make appropriate approximations; plausibility assess the results analyze how energy is stored and transported in an electromagnetic field. 17) Describe and analyze electromagnetic wave propagation in free-space. 18) To understand principles of propagation of uniform plane waves.
Module Learning Outcomes	1) Describe and understand the principle of the Current and current density, continuity of current Conductor properties and boundary conditions, dielectric materials and boundary conditions, Method of images 2) 3) Recognize the Poisson's and Laplace's equations. 4) Explain Electrostatic in Material Space, Current, Current Density and Conductors. 5) Discuss the Capacitance, several capacitance examples 6) Identify the Laplace's Equations and their applications. 7) To identify the concepts of Magnetostatics and their applications. 8) To explain the concepts of Electromagnetic Fields, waves and wave a. propagation. 9) To understand the relations between the fields under time varying situations. 0) Describe and understand the principle of Ampere's circuit Law- Maxwell's Equation 1) Identify Magnetic Forces, Materials, and Devices 2) An ability to distinguish, identify, define, formulate, and solve Magnetic Scalar and Vector Potentials, Derivation of Boit-Savart's Law and Ampere's Law
Indicative Contents	Current and current density, continuity of current Conductor properties and boundary conditions, dielectric materials and boundary conditions, Method of images Capacitance, several capacitance examples, Poisson's and Laplace's equations, The steady magnetic field, Boit-Savart law, Ampere's circuital law, The curl, Stokes theorem, Magnetic flux and magnetic flux density, the scalar and vector magnetic potentials. Magnetic forces, Force on a moving charge, force on differential current element, force between differential current elements, force and torque on a closed circuit. Magnetic materials and inductance

	Steady Magnetic Field, Maxwell's equations in point form, Maxwell's equations in integral form.

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

Student Workload (SWL)

Structured SWL (h/sem)	48	**Structured SWL (h/w)**	3.2
Unstructured SWL (h/sem)	27	**Unstructured SWL (h/w)**	1.8
Total SWL (h/sem)	75		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	5(10%)	Suddenly	2-11
	Assignments	2	5(10%)		6
	Projects / Lab.	-	10%		
	Report	-	10%		
Summative assessment	**Midterm Exam**		(10%)	12	1-5
	Final Exam		(50%)	16	1-11
Total assessment			(100%)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Current and current density, continuity of current
Week 2	Conductor properties and boundary conditions, dielectric materials and boundary conditions
Week 3	Method of images
Week 4	Capacitance, several capacitance examples
Week 5	Poisson’s and Laplace's equations
Week 6	The steady magnetic field, Boit-Savart law
Week 7	Ampere's circuital law
Week 8	The curl
Week 9	Stokes theorem
Week 10	Magnetic flux and magnetic flux density, the scalar and vector magnetic potentials.
Week 11	Magnetic forces, Force on a moving charge, force on differential current element, force between differential current elements, force and torque on a closed circuit.
Week 12	Magnetic materials and inductance
Week 13	Steady Magnetic Field
Week 14	Steady Magnetic Field
Week 15	Maxwell's equations in point form, Maxwell's equations in integral form.
Week 16	Preparatory week before the final Exam

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

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	3- Mathihew N. O. Sadiku, "Elements of Electromagnetics" , 6th Edition, OXFORD UNIVERSITY PRESS, 2015. 4- William H. Hayt, Jr. . John A. Buck," Engineering Electromagnetics", 6th Edition, The McGraw Companies, 2001. 3- Joseph A. Edminister, Mahmood Nahvi, " Electromagnetics", 4th Edition, McGraw-Hill Education, 2014.	Online
Recommended Texts	3- Mathihew N. O. Sadiku, "Elements of Electromagnetics" , 6th Edition, OXFORD UNIVERSITY PRESS, 2015. 4- William H. Hayt, Jr. . John A. Buck," Engineering Electromagnetics", 6th Edition, The McGraw Companies, 2001.	Online
Websites		

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

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Engineering College
كلية الهندسة
2012
1432
جامعة ميسان
Misan University

LEVEL: UGII

Semester - 4:

5- EL215 - Computer Programming II

Module Information معلومات المادة الدراسية					
Module Title	**Computer Programming II**			**Module Delivery**	
Module Type	**C**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EL225**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level		UGII	**Semester of Delivery**		One
Administering Department		ELE.ENG.DEPT	**College**	Engineering	
Module Leader	Assist.Lect. Ahmed Majed Althahabi		**e-mail**	ahmedmajed@uomisan.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	**Module Leader's Qualification**		Assist.Lect.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		6/8/2024	**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To demonstrate about Python data structures like Lists, Tuples, Sets and Dictionaries. 2. To understand about Functions, Modules and Regular Expressions in Python 2 Programming. 3. To build basic programs using fundamental programming constructs like variables, Conditional logic, looping, and functions. 4. Work with user input to create fun and interactive programs. 5. To be able to introduce core programming basics and various Operators of Python Programming language. 6. To demonstrate about Python data structures like Lists, Tuples, Sets and dictionaries 7. To understand about Functions, Modules and Regular Expressions in Python Programming.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The students should be able to 1. Understand basic principles of computers 2. Understand basics of binary computation 3. Understand the programming basics (operations, control structures, data types, etc.) 4. Student should be able to understand the basic concepts of scripting and the contributions of scripting language. 5. Ability to explore python data structures like Lists, Tuples, Sets and dictionaries. 6. Ability to create practical and contemporary applications using Functions, Modules and Regular Expressions. 7. Readily use the Python programming language 8. Apply various data types and control structure 9. Understand class inheritance and polymorphism 10. Understand the object-oriented program design and development 11. Understand and begin to implement code. **Course Description** Introduction to programming basics (what it is and how it works), binary computation, problem-solving methods and algorithm development. Includes procedural and data abstractions, program design, debugging, testing, and documentation. Covers data types, control structures, functions, parameter passing, library functions, arrays, inheritance and object oriented design. Laboratory exercises in Python.
Indicative Contents المحتويات الإرشادية	**Module 1**: Introduction -- Relationship between computers and programs -- Basic

	principles of computers -- File systems -- Using the Python interpreter -- Introduction to binary computation -- Input / Output. **Module 2**: Data types and control structures -- Operators (unary, arithmetic, etc.) -- Data types, variables, expressions, and statements -- Assignment statements -- Strings and string operations -- Control Structures: loops and decision. **Module 3**: Modularization and Classes -- Standard modules -- Packages -- Defining Classes -- Defining functions -- Functions and arguments (signature). **Module 4**: Exceptions and data structures -- Data Structures (array, List, Dictionary) -- Error processing -- Exception Raising and Handling. **Module 5**: Object oriented design -- Programming types -- Object Oriented Programming -- Object Oriented Design -- Inheritance and Polymorphism. 3 **Module 6**: Remaining materials.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Think-Pair-Share: Integrate think-pair-share activities where students individually think about a programming problem or concept, pair up with a classmate to discuss their ideas, and then share their thoughts with the larger class. This encourages critical thinking, collaboration, and active participation. **Case-Based Learning:** Present real-life case studies or scenarios that require students to analyze, design, and implement Python solutions. This promotes problem-solving skills, critical thinking, and the application of programming concepts to practical situations. **Code Review Sessions**: Conduct code review sessions where students present their code to the class, explaining their thought process and seeking feedback. This promotes critical thinking, analysis of code quality, and constructive feedback exchange. **Quizzes and Assessments**: Incorporate regular quizzes and assessments to assess students' understanding of Python concepts, syntax, and problem-solving skills.Use online platforms or interactive tools that provide immediate feedback to enhance engagement and promote self-assessment. **Group Projects**: Assign group projects that require students to collaborate on developing a Python application or solving a programming problem. This encourages teamwork, division of tasks, and coordination, while applying their programming skills. **Homework Assignments**: Assign regular programming exercises and projects as homework. Encourage students to actively apply the concepts learned in class to real-world scenarios. Provide constructive feedback on their

	submissions to promote improvement and reinforce learning.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Module 1:** Introduction -- Arrays (One dimensional) - Arrays (Two Dimensional --Functions: Built-in function functions (Library functions), and User-Defined functions), Function prototype (Declaration), function call, Passing arguments to a function, return statement, Local and global variables.
Week 2	Functions (Value-Returning) vs. Void (Non Value Returning) functions, function with no argument and no return value, function with no argument but return value, function with

	argument but no return value, function with argument and return value.
Week 3	Module 2: -- File systems -- Using the Python interpreter -- Introduction to binary computation -- Input / Output.
Week 4	-- Data types and control structures -- Operators (unary, arithmetic, etc.) -- Data types, variables, expressions, and statements -- Assignment statements
Week 5	-- Strings and string operations -- Control Structures: loops and decision.
Week 6	Quiz
Week 7	Module 3: --Modularization and Classes -- Standard modules -- Packages
Week 8	-- Defining Classes
Week 9	-- Defining functions
Week 10	-- Error processing -- Exception Raising and Handling.
Week 11	Module 5: --Object oriented design –- Programming types.
Week 12	-- Object Oriented Programming -- Object Oriented Design
Week 13	-- Inheritance and Polymorphism.
Week 14	Quiz 2
Week 15	Module 6: Remaining materials.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	**Practical Exercises No.1 -- Demonstrate about Basics of Python Programming.**
Week 2	**Practical Exercises No.2 -- Demonstrate about fundamental Data types in**

	Python Programming. (i.e., int, float, complex, bool and string types)
Week 3	**Practical Exercises No.3 -- Demonstrate the working of following functions in Python.** **i) id( ) ii) type( ) iii) range( )**
Week 4	**Practical Exercises No.4 -- Write a Python program to demonstrate various base conversion functions.**
Week 5	**Practical Exercises No.5 -- Write a Python program to demonstrate various type conversion functions.**
Week 6	**Practical exercises No.6 -- Demonstrate the following Operators in Python with suitable examples.** **i) Arithmetic Operators** **ii) Relational Operators** **iii) Assignment Operator iv) Logical Operators** **v) Bit wise Operators vi) Ternary Operator** **vii) Membership Operators viii) Identity Operators**
Week 7	**Practical exercises No.7 -- Write Python programs to demonstrate the following:** **i) input( )** **ii) print( )** **iii) 'sep' attribute iv) 'end' attribute** **v) replacement Operator ({ })**
Week 8	**Practical exercises No.8 -- Demonstrate the following Conditional statements in Python with suitable examples.** **i) if statement** **ii) if else statement** **iii) if – elif – else statement**
Week 9	**Practical exercises No.9 -- Demonstrate the following Iterative statements in Python**

	with suitable examples. **i) while loop** **ii) for loop**
Week 10	**Practical exercises No.10 -- Demonstrate the following control transfer statements in Python with suitable examples.** **i) break** **ii) continue** **iii) pass**
Week 11	**Practical exercises No.11 -- Write Python programs to print Patterns:**
Week 12	**Practical exercises No.12 -- Write a Python program to demonstrate various ways of accessing the string.** **i) By using Indexing (Both Positive and Negative)** **ii) By using Slice Operator**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Braunschweig, D. and Busbee, K. L. (2018). Programming Fundamentals – A Modular Structured Approach, 2nd Edition.	**yes**

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 Technical II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EL226**				
ECTS Credits	2				
SWL (hr/sem)	50				
Module Level	**UGII**		**Semester of Delivery**		
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	**Dr. Haider Khalaf Allamy**		**e-mail**	Haider.allamy@uomisan.edu.iq	
Module Leader's Acad. Title	**Lecturer**		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	**EL216**	**Semester**	**Three**
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To establish the basic concepts of Digital Combinational Circuits Design. 2. To understand the basic Arithmetic and digital circuits. 3. To perform Logical and digital Circuits analysis. 4. To develop problem solving skills and understanding of Digital Systems through the application of techniques. 5. To establish the basic design concepts of Digital Sequence machines and counters. 6. To understand the Basic digital memory circuits and types. 7. To perform Logical and digital sequential circuits analysis. 8. To introduce the Basic Digital circuits operation and analysis
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1) To outline the formal procedures for the analysis and design of combinational circuits. 2) Students should be able to explain about digital systems and logic circuits. 3) The students should be able to differentiate between combinational and sequential circuits through understanding the clocking and synchronization. 4) To introduce Latches and Flip-flops Design as Simple Sequential Circuits Examples 5) To introduce the Basics of Digital Counters Analysis and Design as a sequential machine. 6) To Learn the design and analysis of Shift registers with various types 7) To outline the Basic Digital memory Circuits, types, operation, capacity and organization.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **COMBINATIONAL CIRCUITS: 12 Hours** Adders Arithmetic Operations: Subtractions, half and full adders and subtractions, binary parallel address. Code Conversion: Even and odd party logic, decoders, encoders, comparators, multiplexers and DE multiplexers. Sequential logic circuits: **12 Hours** Latches: SR latch, Gated SR Latch, D-latch, D-latch with enable Flip- flops: latches flip- flops, R-S and J-K flip, Master Slave flip flop, J-K flip flop, T and D flip flop Counters: **12 Hours** Mode N Counters, ripple counters, synchronous counters, ring/Johnson counters. Asynchronous counters- Mod-N or divided by N Counter. Shift registers: **4 Hours** Basic principle, serial and parallel data transfer, shift left/right registers, universal shift register. Shift Registers. Memory design: **5 Hours** Classification of memories, ROM, ROM organization, PROM, EPROM, EEPROM, EAPROM, RAM, RAM organization, Write operation, Read operation, Memory cycle, Timing wave forms, Memory decoding, memory expansion.

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	0.45
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**COMBINATIONAL CIRCUITS: 12 Hours** Adders Arithmetic Operations: half and full adders
Week 2	Subtractions, Subtractions and binary parallel address.
Week 3	Code Conversion: Even and odd party logic, decoders, encoders
Week 4	Comparators, multiplexers and DE multiplexers.
Week 5	Sequential logic circuits: **12 Hours** Latches: SR latch, Gated SR Latch, D-latch,
Week 6	D-latch with enable Flip- flops: latches
Week 7	Flip- flops, R-S and J-K flip flop
Week 8	Master Slave flip flop, J-K flip flop, T and D flip flop
Week 9	Counters: **12 Hours** Mode N Counters, ripple counters
Week 10	synchronous counters, ring/Johnson counters
Week 11	Asynchronous counters Mod-N or divided by N Counter
Week 12	Shift registers: **4 Hours** Basic principle, serial and parallel data transfer.
Week 13	Shift left/right registers, universal shift register. Shift Registers.
Week 14	Memory design: **5 Hours** Classification of memories, ROM, ROM organization, PROM, EPROM, EEPROM, EAPROM, RAM, RAM
Week 15	Organization, Write operation, Read operation, Memory cycle, Timing wave forms, Memory decoding, memory expansion.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	LAB1: Design and implementation of Adder and Subtractor using logic gates.
Week 2	Design and implementation of 4 bit binary Adder/ Subtractor and BCD adder.
Week 3	Design and implementation of 2 bit Magnitude Comparator using logic gates 8 Bit Magnitude Comparator.
Week 4	Design and implementation of 16 bit odd/even parity checker generator.
Week 5	Design and implementation of Multiplexer and De-multiplexer using logic gates
Week 6	Design and implementation of encoder and decoder using logic gates

Week 7	Realization of RS-JK & D flip-flops using Universal logic gates.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Thomas L. Floyd, Digital Fundamentals, 8th Edition, Pearson Education Inc, New Delhi, 2003	yes
Recommended Texts	M. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 / Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.	yes
Websites		

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

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MODULE DESCRIPTION FORM

Module Information					
Module Title	**Mathematics IV**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	ENG202				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	2		**Semester of Delivery**	4	
Administering Department	Electrical Eng. Dep.		**College**	Type College Code	
Module Leader	Haider Abdalkarem Rahem		**e-mail**	Hayder.a.kareem@uomisan.edu.iq	
Module Leader's Acad. Title	Asst. Lecturer		**Module Leader's Qualification**	M.Sc.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	**EE213**	**Semester**	**3**
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	This course, Mathematics IV, is specifically designed for undergraduate students in the field of Electrical Engineering. After completing this module, students should have developed a clear understanding of the fundamental concepts of Mathematics and a range of skills allowing them to work effectively with the concepts. The basic concepts are: 1) **First order ODE** such as the topics of Concept of solution, the General and Particular solutions, Initial Value Problem (IVP) and Boundary Value Problem (BVP), Linear and Non-linear ODEs, and the General Solutions of First Order ODEs.

	2) **Second and Higher Order ODEs** such as the topics of Homogeneous Linear ODEs of Second Order (Superposition Principles), Initial Value Problem. Basis. General Solution, Homogeneous Linear ODEs with Constant Coefficients, Euler - Cauchy Equations, Differential Operator (D-operator), Methods of Solving Non-homogeneous Linear ODEs, and Solving of higher order linear ODEs with Constant Coefficients. **3) Fourier Analysis** such as the topics of Periodic and non- Periodic Functions, Euler Formulas, Even and Odd functions, Half Range Expansion (Fourier Sine and Fourier Cosine), Complex Fourier Series (Exponential), and Applications of Fourier Series in Electric Circuits. **4) Sequences and series** such as the topics of Convergence and Divergence Test, Geometric Series and Partial Sum, Integral, Comparison, Ratio and Root Tests, Alternating series, Power Series, Applications of Power Series, and Taylor and Maclaurin Series.
Module Learning Outcomes	After completing this module, students should demonstrate competency in the following skills: 1) Understanding the homogeneous and nonhomogeneous, linear and nonlinear equations. 2) Be able to derive and calculate differential equation. 3) Solving the first, second, and higher order ODEs using different solution of methods. 4) Be able to calculate and derive Bernoulli theorem. 5) Be able to calculate second order differential equation and understand their applications in electronic circuits. 6) Understand the Fourier series and Euler formulas. 7) Be able to determine the sum of certain infinite series, when they exist. 8) Be able to approximate the sum of certain infinite series and analyze the error. 9) To find Geometric, Power, Taylor and Maclaurin series representations for certain functions.
Indicative Contents	**Indicative contents (Course Outlines) include the following: -** **Part A: Differential Equations** **(i) Chapter One First order ODE** i. An introduction to Differential Equations (DEs). i i. Basic Concepts 1. Concept of solution. 2. The General and Particular solutions. 3. Initial Value Problem (IVP) and Boundary Value Problem (BVP). 4. Linear and Non-linear ODEs.

	iii. The General Solutions of First Order ODEs. 1. Separable ODEs. 2. Equations Reduction to Separable Form. 3. Exact ODEs. 4. Reduction to Exact Form (Integrating Factors). 5. Linear ODEs. 6. Reduction to Linear Form (Bernoulli Equation). **(ii) Chapter Two Second and Higher Order ODEs** i. An introduction to second order ODEs. ii. Homogeneous Linear ODEs of Second Order (Superposition Principles). iii. Initial Value Problem. Basis. General Solution. iv. Homogeneous Linear ODEs with Constant Coefficients. v. Euler - Cauchy Equations. vi. Differential Operator (D-operator). vii. Methods of Solving Non-homogeneous Linear ODEs. 1. Method of Undetermined Coefficients. 2. Method of Variation of Parameters. viii. Solving of higher order linear ODEs with Constant Coefficients. **Part B: Chapter Three Fourier Analysis** i. An introduction of Fourier Series. ii. Periodic and non- Periodic Functions, Euler Formulas. iii. Even and Odd functions. iv. Half Range Expansion (Fourier Sine and Fourier Cosine). v. Complex Fourier Series (Exponential). vi. Applications of Fourier Series in Electric Circuits. **Part C: Chapter Four Sequences and series** i. Convergence and Divergence Test. ii. Geometric Series and Partial Sum. iii. Integral, Comparison. iv. Ratio and Root Tests. v. Alternating series. vi. Power Series vii. Applications of Power Series. viii. Taylor and Maclaurin Series.

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

Student Workload (SWL)			
Structured SWL (h/sem)	63	**Structured SWL (h/w)**	4.2
Unstructured SWL (h/sem)	37	**Unstructured SWL (h/w)**	2.4
Total SWL (h/sem)	100		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	4, 10	All
	Assignments	2	20% (20)	5, 11	All
	Report			10	All
Summative assessment	**Midterm Exam**	2hr	10% (10)	8	All
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	**Chapter One First order ODE** An introduction to Differential Equations (DEs). Basic Concepts (Concept of solution, The General and Particular solutions, Initial Value Problem (IVP) and Boundary Value Problem (BVP), Linear and Non-linear ODEs)
Week 2	**Chapter One First order ODE** The General Solutions of First Order ODEs (Separable ODEs, Equations Reduction to Separable Form)
Week 3	**Chapter One First order ODE** The General Solutions of First Order ODEs (Exact ODEs, Reduction to Exact Form (Integrating Factors)).
Week 4	**Chapter One First order ODE** The General Solutions of First Order ODEs (Linear ODEs, Reduction to Linear Form (Bernoulli Equation)).
Week 5	**Chapter Two Second and Higher Order ODEs** An introduction to second order ODEs.

	Homogeneous Linear ODEs of Second Order (Superposition Principles). Initial Value Problem. Basis. General Solution.
Week 6	**Chapter Two Second and Higher Order ODEs** Homogeneous Linear ODEs with Constant Coefficients. Euler - Cauchy Equations. Differential Operator (D-operator).
Week 7	**Chapter Two Second and Higher Order ODEs** Methods of Solving Non-homogeneous Linear ODEs. Method of Undetermined Coefficients. Method of Variation of Parameters
Week 8	Mid-term exam
Week 9	**Chapter Three Fourier Analysis** An introduction of Fourier Series. Periodic and non- Periodic Functions, Euler Formulas. Even and Odd functions.
Week 10	**Chapter Three Fourier Analysis** Half Range Expansion (Fourier Sine and Fourier Cosine). Complex Fourier Series (Exponential). Applications of Fourier Series in Electric Circuits.
Week 11	**Chapter Four Sequences and series** Convergence and Divergence Test. Geometric Series and Partial Sum.
Week 12	**Chapter Four Sequences and series** Integral, Comparison. Ratio and Root Tests.
Week 13	**Chapter Four Sequences and series** Alternating series. Power Series. Applications of Power Series.
Week 14	**Chapter Four Sequences and series** Taylor and Maclaurin Series.
Week 15	**Chapter Four Sequences and series** Taylor and Maclaurin Series
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Kreyszig, E. (2010). *Advanced engineering mathematics*. John Wiley & Sons.	Yes
Recommended Texts	Thomas, G. B., Weir, M. D., Hass, J., Heil, C., & Behn, A. (2016). *Thomas' Calculus Early Transcendentals*. Pearson.	Yes
Websites		

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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	جرائم البعث			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MNS 120**				
ECTS Credits	2				
SWL (hr/sem)	**50**				
Module Level		2	**Semester of Delivery**		2
Administering Department		Type Dept. ELE	**College**	Type College Code	
Module Leader	Muaid Kareem		**e-mail**	**muayad.k.hassan@uomisan.edu.iq**	
Module Leader's Acad. Title		Asst. teacher	**Module Leader's Qualification**		Msc.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	**للتعرف والاطلاع على مجموعة من الجرائم التي ارتكبها حزب البعث البائد والمنحل بحق أبناء الشعب العراقي ومن مختلف المكونات لأطيافه ولتأسيس وعي للطلبة لرفض جميع اشكال الظلم والتسلط لهذه الأنظمة والمطالبة بجميع الحقوق المدنية والسياسية**
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**1-تعرف الطالب على جرائم البعث وفق قانون المحكمة الجنائية العراقية,**
Indicative Contents المحتويات الإرشادية	**للتعرف على القرارات الصادرة من المحكمة الجنائية**

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**القاء المحاضرات واستخدام طريقة النقاش والحوار**

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

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	1	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	1	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	10% (10)	1	LO # 5, 8 and 10

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	مفهوم وتعريف الجرائم وأقسامها تعريف الجريمة لغة واصطلاحات
Week 2	موقف قانون المحكمة الجنائية العليا لسنة 2005 من انتهاكات نظام البعث وأهم القرارات الصادرة عنها
Week 3	التكييف القانوني لجرائم المقابر الجماعية خلال حكم نظام البعث
Week 4	انواع الجرائم الدولية
Week 5	دور نظام البعث في الانتهاكات النفسية وأثارها المترتبة عليها
Week 6	دور نظام البعث في الانتهاكات الاجتماعية وأثارها المترتبة عليها
Week 7	موقف نظام البعث من الدين والمؤسسات الدينية
Week 8	دور نظام البعث بأنتهاك القوانين الخاصة بحقوق الانسان
Week 9	امتحان نصف الفصل
Week 10	انتهاكات نظام البعث السياسية والعسكرية
Week 11	انتهاكات نظام البعث للبيئة في العراق / التلوث الحربي
Week 12	انتهاكات نظام البعث للبيئة في العراق/ تدمير المدن والقرى
Week 13	انتهاكات نظام البعث للبيئة في العراق/تجفيف الاهوار والبساتين
Week 14	التكييف القانوني والشرعي لجريمة المقابر الجماعية
Week 15	الامتحان النهائي

Learning and Teaching Resources مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	جرائم نظام البعث في العراق	No
Recommended Texts	أرشيف مؤسسة السجناء السياسيين	No
Websites	اي مصادر وثائقية موثوقة على الانترنيت	

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