جامعة البيان

وصف البرنامج الاكاديمي
مسار بولونيا

جامعة البيان
الكلية التقنية الهندسية

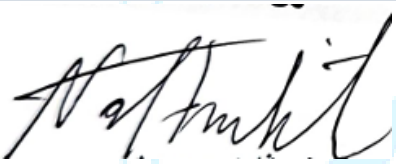
2025 - 2024

قسم تقنيات الهندسة الكهربائية

2024-10-1

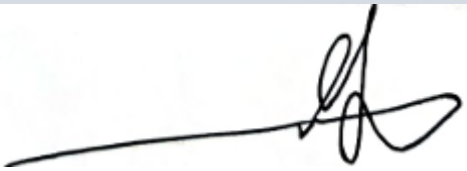
اسم الجامعة	جامعة البيان
اسم الكلية	الكلية التقنية الهندسية
اسم القسم	قسم تقنيات الهندسة الكهربائية
عنوان البرنامج الأكاديمي	بكلوريوس تقنيات الهندسة الكهربائية
اسم الشهادة الممنوحة	تقنيات الهندسة الكهربائية
نوع الدراسة	مسار بولونيا
تأريخ اعداد وصف البرنامج	2024-9-1
تاريخ اكمال وصف البرنامج	2024-10-1

رئيس القسم	
التوقيع	
الاسم	**م.د مريم قتيبة عبد الرزاق**
التأريخ	**2024/10/1**

معاون العميد للشؤون العلمية	
التوقيع	
الاسم	**م.د نوف ثابت محمود**
التأريخ	**2024/10/1**

دقق الملف من قبل شعبة ضمان الجودة والأداء الجامعي

مسؤول شعبة ضمان الجودة والأداء الجامعي

التوقيع	
الاسم	**م.د. مريم قتيبة عبد الرزاق**
التأريخ	**2024/10/1**

مصادقة العميد

1. رؤية البرنامج الأكاديمي

.

تلبية احتياجات التطور العلمي في مجالات تقنيات الهندسة الكهربائية من خلال إعداد مهندسين متمكنين علميًا وعمليًا، قادرين على الابتكار والتكيف مع أحدث التوجهات في المجال.

2. رسالة البرنامج الأكاديمي

يسعى القسم إلى اعداد مهندسين ذوي كفاءات عالية يمتلكون المهارات الهندسية والفنية المتخصصة في مجال الطاقة الكهربائية، بما يساهم في تلبية احتياجات المجتمع ودعم المشاريع الحكومية والخاصة في الدولة.

3. اهداف البرنامج الأكاديمي

- إعداد مهندسين تقنيين متميزين يمتلكون المهارات اللازمة في تقنيات الهندسة الكهربائية.
- تعزيز الجانب التقني من خلال زيادة الوحدات العملية دون التأثير على الجوانب النظرية.
- تأهيل الخريجين لتلبية احتياجات سوق العمل المحلي والدولي.
- مواكبة التطورات العالمية في البرامج الدراسية والتركيز على الجوانب العملية.
- تعزيز معايير الأداء الأكاديمي وضمان التوافق مع المعايير الدولية في التعليم الهندسي

4. الاعتماد البرامجي

لا يوجد

5. المؤثرات الخارجية الاخرى

لا يوجد

6. وصف البرنامج

السنة/الفصل	رمز المقرر	اسم المقرر	الساعات المعتمدة	
			النظرية	العملية
الاولى		مسار بولونيا		

الثانية	مسار بولونيا

1. الهيئة التدريسية

الرتبة العلمية	التخصص		اعداد الهيئة	
	العام	الدقيق	ملاك	محاضر
استاذ				
أستاذ مساعد	هندسة الميكانيك	هندسة الميكانيك	2	
	هندسة الكهرباء	هندسة الكهرباء		
مدرس	هنندسة الاتصالات	هندسة الاتصالات	4	
	هندسة الكهرباء	هندسة الكهرباء		

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**DC Electrical Circuits**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EET1101**				
ECTS Credits	**8**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	ENG – EET		**College**	EETC	
Module Leader			**e-mail**		
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	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop a thorough understanding of the scientific principles that govern DC electrical circuits, including voltage, current, resistance, and power relationships. 2. To apply scientific laws, such as Ohm's law and Kirchhoff's laws, to accurately analyze and solve electrical circuits. 3. To explore the scientific properties and behavior of circuit components, including resistors and understand their impact on circuit performance. 4. To enhance problem-solving skills by scientifically analyzing complex circuit configurations and proposing appropriate solutions. 5. To investigate the scientific principles underlying circuit design and evaluation, including the selection of components based on scientific criteria and the assessment of circuit performance using scientific measurements. 6. To study the scientific aspects of transient and steady-state behavior in circuits, including the analysis of DC and AC circuits, and interpret scientific data represented by voltage and current waveforms. 7. To utilize scientific simulation tools and modeling techniques for scientific exploration, experimentation, and validation of circuit behavior. 8. To emphasize the importance of adhering to scientific safety protocols when working with electrical circuits, ensuring compliance with scientific guidelines and standards. 9. To establish connections between scientific principles and practical scenarios, highlighting the scientific relevance of electrical circuits in real-world scientific applications and technological advancements. 10. To foster scientific critical thinking skills in evaluating circuit configurations, proposing scientifically-based design improvements, and scientifically assessing limitations and potential risks associated with circuit operation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand fundamental concepts in electrical circuits (voltage, current, resistance, power, energy) and their relationships. 2. Apply circuit analysis techniques (Ohm's law, Kirchhoff's laws, network theorems) to analyze and solve circuits. 3. Identify and describe characteristics of circuit components (resistors, capacitors, inductors, operational amplifiers). 4. Analyze series and parallel circuits, calculate equivalent resistances, and understand voltage/current division. 5. Apply circuit theorems and techniques (superposition, nodal analysis, mesh analysis, source transformation) for circuit simplification and analysis. 6. Analyze transient and steady-state responses of circuits under DC and AC conditions. 7. Analyze DC circuits using phasor notation, impedance, and understand reactance and complex power.

	8. Utilize circuit simulation software for modeling, simulating, and analyzing circuits. 9. Understand electrical safety practices and ethical considerations in working with circuits. 10. Apply critical thinking and problem-solving skills to analyze and solve circuit problems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Circuit Theory 1. 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. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [14 hrs] 2. RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [14 hrs] 3. Revision problem classes [6 hrs] Part B - Analogue Electronics 4. 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. [16 hrs.] 5. 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. [14 hrs.]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Two main strategies 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. 1. Theory-Based Lectures: Traditional classroom lectures are used to present theoretical concepts, principles, and theories related to electrical engineering. Professors or instructors explain complex ideas, provide examples, and engage students in discussions to foster understanding. 2. Laboratory Experiments: Laboratory sessions are an integral part of electrical engineering education. Students engage in hands-on experiments, using equipment, instruments, and software tools to apply theoretical knowledge, analyze data, and gain practical skills. This helps them understand the practical aspects of electrical engineering and reinforces theoretical concepts.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	106	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• Introduction to DC circuits and circuit elements. • Voltage, current, and resistance (Ohm's Law).
Week 2	• Kirchhoff's Laws. • Series and parallel circuits. • Circuit analysis techniques: Node voltage method.
Week 3	• Circuit analysis techniques: Mesh current method. • Superposition theorem.
Week 4	• Thevenin's theorem. • Norton's theorem.
Week 5	• Maximum power transfer theorem. • Capacitors in DC circuits: Charging and discharging.
Week 6	• Inductors in DC circuits: Transients and time constants.

	• RL circuits.
Week 7	• Transients in RC circuits • Capacitive and inductive reactance
Week 8	• Transients in RL circuits • Natural response and forced response
Week 9	• Transients in LC circuits • Resonance in series and parallel circuits
Week 10	• Mesh analysis with dependent sources
Week 11	• Network theorems: Millman's theorem, reciprocity theorem
Week 12	• Introduction to three-phase circuits
Week 13	• Delta-star transformation
Week 14	• Three-phase circuits: Delta and star connections
Week 15	• Review and revision
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	• Introduction to laboratory equipment and safety procedures. • Measurement of voltage, current, and resistance using multimeters.
Week 2	• Verification of Ohm's Law and Kirchhoff's Laws in series and parallel circuits. • Measurement of power and energy.
Week 3	• Superposition theorem verification, Thevenin's and Norton's theorem verification.
Week 4	• Maximum power transfer demonstration. • Charging and discharging of capacitors in RC circuits.
Week 5	• Transient response of RL circuits. • Measurement of inductance and time constants.
Week 6	• Circuit simulation using software tools. • Design and simulation of basic circuits.
Week 7	• Transient response of RC circuits. • Measurement of capacitive reactance.
Week 8	• Transient response of RL circuits. • Measurement of inductive reactance.
Week 9	• Transient response of LC circuits. • Resonance in series and parallel circuits.
Week 10	• Mesh analysis with dependent sources.
Week 11	• Delta-star transformation demonstration.
Week 12	• Troubleshooting and debugging techniques.
Week 13	• Measurement of power in three-phase circuits

Week 14	• Three-phase circuits: Delta and star connections.
Week 15	• Final project: Design, implementation, and testing of a complex circuit. • Final project demonstration and presentation. • Course review and feedback.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

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

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Digital Technologies**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EET1102**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	ENG – EET		**College**	EETC	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst. Professor		**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	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop a solid understanding of fundamental digital principles: The aim is to grasp the basic concepts of digital logic, number systems, Boolean algebra, and logic gates, providing a strong foundation for further studies in digital circuits and systems. 2. To acquire practical skills in circuit design and implementation: The aim is to develop practical skills in designing, implementing, and testing digital circuits using laboratory equipment, integrated circuits, and various logic gates. 3. To enhance problem-solving and analytical thinking abilities: The aim is to cultivate problem-solving skills by analyzing and simplifying complex digital circuits using Boolean algebra, truth tables, and logic simplification techniques. 4. To foster teamwork and collaboration: The aim is to encourage collaboration through group projects, lab exercises, and discussions, fostering teamwork skills and the ability to work effectively in a digital design environment. 5. To promote critical thinking and application of knowledge: The aim is to encourage critical thinking by applying theoretical knowledge to real-world scenarios, such as designing circuits to perform specific functions or solving digital logic problems using different logic gates and techniques.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate a comprehensive understanding of digital principles: Students will be able to explain the fundamental concepts of digital logic, number systems, Boolean algebra, and logic gates, and apply this knowledge to analyze and design digital circuits. 2. Apply theoretical knowledge to practical circuit design: Students will be able to utilize their understanding of digital principles to design, implement, and test digital circuits using appropriate components, such as logic gates, integrated circuits, and laboratory equipment. 3. Analyze and simplify complex digital circuits: Students will develop the ability to analyze complex digital circuits using Boolean algebra, truth tables, and logic simplification techniques. They will be able to simplify circuits to their minimal form and optimize them for efficient operation. 4. Collaborate effectively in team projects: Students will demonstrate effective teamwork skills by actively participating in group projects, lab exercises, and discussions. They will be able to work collaboratively, contribute their ideas, and communicate effectively with their team members. 5. Apply critical thinking to solve digital logic problems: Students will develop critical thinking skills by applying their knowledge of digital principles to solve problems and design circuits to meet specific requirements. They will be able to evaluate different approaches, select appropriate logic gates, and devise effective solutions.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1. **Number systems and Boolean algebra: [24 hrs.]** • Introduction to binary, decimal, octal, and hexadecimal number systems • Conversion between number systems • Boolean algebra operations (AND, OR, NOT) • Laws and theorems of Boolean algebra 2. **Logic gates and combinational logic circuits: [24 hrs.]** • Introduction to logic gates (AND, OR, NOT, XOR, NAND, NOR) • Truth tables and logic simplification techniques (Karnaugh maps, Boolean algebra) • Combinational logic circuits design and analysis • Multiplexers and demultiplexers 3. **Flip-flops and sequential logic circuits: [26 hrs.]** • Introduction to flip-flops (SR, JK, D, T) • Analysis and design of sequential logic circuits • State diagrams and state tables • Registers and counters
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Two main strategies 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. • Theory-Based Lectures: Traditional classroom lectures are used to present theoretical concepts, principles, and theories related to electrical engineering. Professors or instructors explain complex ideas, provide examples, and engage students in discussions to foster understanding. • Laboratory Experiments: Laboratory sessions are an integral part of electrical engineering education. Students engage in hands-on experiments, using equipment, instruments, and software tools to apply theoretical knowledge, analyze data, and gain practical skills. This helps them understand the practical aspects of electrical engineering and reinforces theoretical concepts.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	56	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1:	• Numerical Systems: Decimal, Binary, Octal, Hexadecimal.
Week 2:	• Conversion between Decimal and Binary. • Conversion between Decimal and Octal.
Week 3:	• Conversion between Decimal and Hexadecimal. • Conversion between Octal and Binary.
Week 4:	• Conversion between Hexadecimal and Binary. • Binary Arithmetic: Addition and Subtraction.
Week 5:	• Binary Arithmetic: Using Complements for Subtraction. • Introduction to Logic Gates: AND, OR, NOT.
Week 6:	• Implementing Logic Gates with Switches. • Implementing AND and OR Gates with Diodes and Resistors.
Week 7:	• Implementing AND, OR, and NOT Gates with Transistors. • Introduction to XOR and XNOR Gates.
Week 8:	• Boolean Algebra: De Morgan's Theorems. • Boolean Algebraic Relationships.
Week 9:	• Implementing Different Gates using NAND Gate. • Implementing Different Gates using NOR Gate.
Week 10:	• Circuits with Different Gates: Truth Table and Logic Equation. • Simplification of Logic Circuits with Boolean Algebra.
Week 11:	• Introduction to Karnaugh Map: 2-variable and 3-variable Maps. • Transferring Truth Table to Karnaugh Map.
Week 12:	• Karnaugh Map: 4-variable Map. • Examples of Digital Circuits with Karnaugh Map.
Week 13:	• Simplification of Logic Circuits with Karnaugh Map: Don't Care Conditions. • Logic Circuits with the Property of Folding and Interlocking.
Week 14:	• Arithmetic Circuits: Half-Adder and Full-Adder.

	• Arithmetic Circuits: Half-Subtractor and Full-Subtractor.
Week 15:	• Review and Revision. • Practice Exam and Preparation for Final Assessment.
Week 16	• Preparatory week before the final Exam.

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1:	• Introduction to Laboratory Equipment and their Usage. • Deriving Truth Tables for NOT, AND, and OR Gates using Switches.
Week 2:	• Deriving Truth Tables for NOT, AND, and OR Gates using Diodes and Transistors. • Implementing NOR and NAND Gates using Diodes and Transistors.
Week 3:	• Implementing and Verifying Exclusive OR (EXOR) and Exclusive NOR (EXNOR) Gates. • Implementing De Morgan's First and Second Laws.
Week 4:	• Constructing Basic Gates using NAND Gate IC7400. • Constructing Basic Gates using NOR Gate IC7402.
Week 5:	• Constructing EXOR Gate using NAND Gate and again using NOR Gate. • Half-Adder Circuit using Different Gates and NAND Gate again.
Week 6:	• Half-Subtractor Circuit using Different Gates and NAND Gate again. • Full-Adder Circuit using Different Gates and NAND Gate again.
Week 7:	• Full-Subtractor Circuit using Different Gates and NAND Gate again. • Implementing Full-Adder and Full-Subtractor Circuits.
Week 8:	• Implementing Half-Adder and Half-Subtractor Circuits.
Week 9:	• Implementing Full-Adder and Full-Subtractor Circuits using ICs. • Using Integrated Circuits for Addition and Subtraction.
Week 10:	• Introduction to Integrated Circuits (ICs). • Implementing 4-bit Binary Addition using ICs.
Week 11:	• Implementing 4-bit Binary Subtraction using ICs. • Implementing Arithmetic Circuits using ICs.
Week 12:	• Practice Exam and Preparation for Assessment.
Week 13:	• Implementing Half-Carry and Full-Carry Lookahead Adders. • Introduction to Carry Lookahead Adder Circuits.
Week 14:	• Implementing Multiplexers and Demultiplexers.
Week 15:	• Design, Implementation, and Testing of a Complex Digital Circuit. • Course review and feedback.
Week 16	• Preparatory week before the final Exam.

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	J. F. Wakerly, "Digital Design: Principles and Practices," 4th ed. Pearson Education, 2005.	Yes
Recommended Texts	T. L. Floyd and R. Fletcher, "Digital Fundamentals," 11th ed. Pearson, 2014.	No
Websites	The Collage E-Library	

Grading Scheme
مخطط الدرجات

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

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

Electrical Engineering Technical College

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Differential Mathematics**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EET1104**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	ENG - EET		**College**	EETC	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst. 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 Aims أهداف المادة الدراسية	The module aims for the Differential Mathematics course are as follows: 1. To develop a solid understanding of the fundamental concepts and techniques of differential calculus and their relevance in engineering contexts. 2. To apply differentiation techniques effectively in solving engineering problems, including optimization, motion analysis, and cost and revenue optimization. 3. To demonstrate proficiency in working with transcendental functions, such as exponential, logarithmic, and inverse trigonometric functions, and their application in engineering. 4. To introduce the basics of differential equations and their importance in modeling and analyzing engineering systems, including growth and decay phenomena and electrical circuits. 5. To enhance problem-solving skills by applying differential calculus concepts to real-world engineering scenarios, fostering critical thinking and analytical abilities.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate a comprehensive understanding of the fundamental concepts and techniques of differential calculus, including limits, derivatives, and their applications in engineering contexts. 2. Apply differentiation techniques proficiently to solve a wide range of engineering problems, such as optimization, motion analysis, and cost and revenue optimization. 3. Utilize transcendental functions effectively in engineering applications, demonstrating competence in working with exponential, logarithmic, and inverse trigonometric functions. 4. Apply the principles of differential equations to model and analyze engineering systems, including growth and decay phenomena and electrical circuits. 5. Employ critical thinking and analytical skills to tackle real-world engineering scenarios, utilizing differential calculus concepts to develop innovative solutions.
Indicative Contents المحتويات الإرشادية	1. Introduction to Differential Calculus [14 hrs.] • Definition of limits and continuity • Basic differentiation rules: power rule, product rule, quotient rule • Applications of derivatives in engineering contexts 2. Optimization Problems in Engineering [14 hrs.] • Local and global extrema of functions • Optimization with constraints • Applications of optimization in engineering design and resource allocation 3. Motion Analysis and Engineering Applications [14 hrs.] • Derivatives of position, velocity, and acceleration functions • Applications of motion analysis in engineering, such as kinematics and dynamics problems 4. Transcendental Functions in Engineering 14 hrs.] • Derivatives of exponential, logarithmic, and trigonometric functions • Applications of transcendental functions in engineering, such as exponential growth/decay and harmonic oscillations 5. Introduction to Differential Equations in Engineering [14 hrs.] • Basic concepts and classifications of differential equations • First-order linear and separable differential equations • Applications of differential equations in engineering, such as modeling growth, decay, and circuit analysis.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The module on Differential Mathematics with a focus on engineering applications implements a range of effective learning and teaching strategies to foster student understanding and engagement. • Lectures introduce key concepts and problem-solving techniques, while interactive discussions facilitate student participation and real-world examples. Problem-solving sessions encourage active learning and collaboration, allowing students to apply differential calculus to engineering problems. • Practical applications are emphasized through case studies and simulations, highlighting the relevance of differential mathematics in an engineering context. Computer-based tools, tutorials, and workshops provide additional support, while assessments and independent study promote feedback and deeper exploration. • Guest speakers and practical projects bridge theory and practice, inspiring students and developing critical thinking skills. By integrating these strategies, the module cultivates a comprehensive understanding of differential mathematics in engineering and equips students with the skills needed for success in their engineering careers.

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

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1:	• Introduction to Differential Calculus. • Limits and Continuity. • Differentiation Rules: Power Rule, Product Rule, Quotient Rule, Chain Rule.
Week 2:	• Derivatives of Trigonometric and Exponential Functions • Derivatives of Logarithmic and Inverse Trigonometric Functions • Implicit Differentiation
Week 3:	• Related Rates • Optimization Problems in Engineering • Curve Sketching: Critical Points, Inflection Points, Concavity
Week 4:	• L'Hôpital's Rule and Indeterminate Forms • Linear Approximation and Differentials
Week 5:	• Applications of Differentiation in Engineering: Rates of Change, Velocity, Acceleration • Motion Problems: Position, Velocity, and Acceleration Functions
Week 6:	• Optimization of Engineering Systems: Maximum and Minimum Problems • Optimization with Constraints
Week 7:	• Applications of Differentiation in Engineering: Marginal Analysis, Cost and Revenue Optimization • Linearization and Error Analysis
Week 8:	• Implicit Differentiation and Higher Derivatives • Related Rates with Engineering Applications
Week 9:	• Transcendental Functions: Derivatives of Exponential and Logarithmic Functions • Applications of Transcendental Functions in Engineering
Week 10:	• Review of Differentiation Techniques • Higher Derivatives and Acceleration in Engineering
Week 11:	• Taylor Series Expansion and Applications • Linear Approximation and Estimation in Engineering
Week 12:	• Introduction to Differential Equations • First-Order Differential Equations: Separable Equations, Linear Equations
Week 13:	• Applications of Differential Equations in Engineering: Growth and Decay, RC Circuits
Week 14:	• Higher-Order Differential Equations and Engineering Applications • Spring-Mass Systems: Modeling and Analysis
Week 15:	• Systems of Differential Equations in Engineering: Electrical Circuits, Control Systems • Phase Plane Analysis: Stability and Classification • Review and Exam Preparation
Week 16	• **Preparatory week before the final Exam**

Electrical Engineering Technical College

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	K.A. Stroud and Dexter J. Booth, "Engineering Mathematics," 7th edition, Palgrave Macmillan, 2013.	Yes
Recommended Texts	E. Kreyszig, "Advanced Engineering Mathematics," 10th edition, Wiley, 2011.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering	

Grading Scheme
مخطط الدرجات

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

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

Electrical Engineering Technical College

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Mechanics**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EET1201**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	ENG - EET		**College**	EETC	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst. Professor		**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 Aims أهداف المادة الدراسية	The module aims to: 1. To introduce students to the fundamental concepts and principles of Mechanics Engineering. 2. To develop students' ability to analyze and solve engineering problems related to statics, dynamics, and equilibrium of forces. 3. To enhance students' critical thinking and problem-solving skills in the context of mechanical systems and components. 4. To foster practical knowledge and hands-on experience through laboratory experiments and application of theoretical concepts. 5. To prepare students for further studies or professional careers in engineering by providing a solid foundation in Mechanics Engineering principles and methodologies.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The module aims to achieve the following five learning outcomes: 1. Knowledge and Understanding: Develop a comprehensive understanding of the fundamental concepts, theories, and principles of Mechanics Engineering, including statics, dynamics, and equilibrium of forces. 2. Problem-Solving Skills: Apply analytical and critical thinking skills to solve engineering problems related to mechanics, including the ability to analyze forces, calculate moments, determine equilibrium conditions, and solve kinematic and kinetic problems. 3. Practical Skills: Gain hands-on experience in conducting experiments, measurements, and analysis related to Mechanics Engineering principles. Develop practical skills in using laboratory equipment, interpreting data, and applying theoretical concepts to real-world scenarios. 4. Communication and Presentation: Effectively communicate engineering ideas, concepts, and solutions through written reports, oral presentations, and graphical representations. Demonstrate the ability to present technical information clearly and concisely. 5. Lifelong Learning: Foster a commitment to lifelong learning and professional development by cultivating an awareness of current trends and advancements in Mechanics Engineering. Develop the skills necessary to continue learning independently and adapt to evolving technologies and methodologies in the field.
Indicative Contents المحتويات الإرشادية	The module may cover the following five indicative contents: 1. Statics: Introduction to statics, including the study of forces, moments, equilibrium, and free-body diagrams. Topics may include the resolution and composition of forces, moment of a force, couples, and the analysis of static equilibrium in two and three dimensions. [15 hrs.] 2. Dynamics: Introduction to dynamics, focusing on the study of motion and forces. Topics may include kinematics, Newton's laws of motion, applications of forces, work, energy, and power. The module may also cover topics such as impulse, momentum, and the conservation of energy and momentum. [15 hrs.] 3. Equilibrium of Structures: Examination of the equilibrium of structures, including the analysis of trusses, beams, and frames. Topics may include determinate and indeterminate structures, internal forces, shear and bending moment diagrams, and the calculation of reactions and forces in structures. [15 hrs.]

	4. Mechanical Systems: Study of mechanical systems, including the analysis of simple machines and mechanisms. Topics may include the analysis of pulley systems, gears, linkages, and other mechanical components. The module may also cover topics such as torque, rotational motion, and the principles of rotational equilibrium. [15 hrs.] 5. Applications and Case Studies: Exploration of practical applications of mechanics engineering principles in real-world scenarios and case studies. Topics may include the application of mechanics in areas such as civil engineering, mechanical engineering, aerospace engineering, and biomechanics. Case studies may involve the analysis of engineering systems, structures, or machines to demonstrate the practical relevance of mechanics principles. [15 hrs.]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module will employ the following learning and teaching strategies: 1. Lectures: Traditional lectures delivered by the instructor to present key concepts, theories, and principles of Mechanics Engineering. Lectures may include visual aids, demonstrations, and examples to enhance understanding and facilitate knowledge transfer. 2. Laboratory Sessions: Practical hands-on laboratory sessions where students can apply theoretical concepts to real-world situations. Students may perform experiments, measurements, and data analysis, gaining practical skills and reinforcing their understanding of Mechanics Engineering principles. 3. Problem-Solving Sessions: Interactive problem-solving sessions where students work individually or in groups to solve engineering problems related to mechanics. This strategy allows students to practice critical thinking, analytical skills, and the application of theoretical knowledge to practical scenarios. 4. Tutorials: Small-group or one-on-one tutorials where students can seek clarification on difficult concepts, discuss challenging problems, and receive personalized guidance from the instructor. Tutorials provide opportunities for active engagement, individualized support, and deeper comprehension of the subject matter. 5. Group Projects: Collaborative group projects that require students to apply their knowledge of Mechanics Engineering to solve complex problems or design projects. This strategy encourages teamwork, communication skills, and the integration of multiple concepts and skills acquired throughout the module.

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) الحمل الدراسي غير المنتظم للطالب خلال الفصل	86	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1:	• Introduction to Engineering Mechanics • Statics and Dynamics • Basic Concepts and Definitions
Week 2:	• Forces: Types, Characteristics, and Properties • Force Vectors and Components • Resultant and Equilibrium of Forces
Week 3:	• Moments and Couples • Moment of a Force • - Moments and Equilibrium
Week 4:	• Free-Body Diagrams • Equilibrium of Planar Forces • Two-Dimensional Force Systems
Week 5:	• Distributed Forces: Centroids and Centers of Gravity • Centroid of Plane Areas • Centroid of Composite Bodies
Week 6:	• Moment of Inertia • Moments of Inertia for Plane Areas • Parallel-Axis Theorem
Week 7:	• Principles of Virtual Work • Equilibrium of Rigid Bodies • Trusses and Frames
Week 8:	• Friction: Types and Laws • Frictional Forces and Equilibrium • Applications of Friction
Week 9:	• Kinetics: Forces and Motion • Newton's Laws of Motion • Linear and Angular Momentum
Week 10:	• Kinetics: Forces and Motion • Newton's Laws of Motion • Linear and Angular Momentum
Week 11:	• Work and Energy • Principle of Work and Energy

	• Conservation of Mechanical Energy
Week 12:	• Power and Efficiency • Impulse and Momentum • Impact and Collision
Week 13:	• Rotational Dynamics • Moment of Inertia for Rigid Bodies • Angular Momentum and Torque
Week 14:	• Vibrations and Oscillations • Free Vibrations and Harmonic Motion • Damping and Resonance
Week 15:	• Review and Recapitulation • Problem-Solving Techniques
Week 16	Preparatory week before the final Exam

	Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
Week 1:	• Introduction to the Laboratory: Familiarization with the lab environment, safety guidelines, and equipment. • Measurement Techniques: Practice using measurement tools such as rulers, calipers, and micrometers.
Week 2:	• Force Measurement: Conduct experiments to measure forces using load cells and force sensors. • Resultant Forces: Calculate and analyze resultant forces in various systems.
Week 3:	• Equilibrium of Forces: Perform experiments to study the equilibrium of forces and verify the principles of static equilibrium. • Moment of a Force: Measure and analyze the moment of a force using torque sensors.
Week 4:	• Free-Body Diagrams: Practice creating free-body diagrams for different mechanical systems. • Two-Dimensional Force Systems: Analyze two-dimensional force systems and calculate resultant forces and moments.
Week 5:	• Centroids and Centers of Gravity: Conduct experiments to determine centroids and centers of gravity for various objects and structures. • Stability Analysis: Study the stability of objects in equilibrium and investigate the effects of shifting centroids.
Week 6:	• Moment of Inertia: Measure the moment of inertia of objects using moment of inertia apparatus. • Parallel-Axis Theorem: Verify the parallel-axis theorem experimentally and calculate moments of inertia for composite bodies.
Week 7:	• Truss Analysis: Analyze and test truss structures to determine internal forces and equilibrium conditions. • Virtual Work Applications: Perform experiments to understand the principles of virtual work and its applications in engineering mechanics.
Week 8:	• Friction: Study different types of friction and measure coefficients of friction using friction apparatus. • Equilibrium with Friction: Analyze systems involving frictional forces and determine equilibrium conditions.
Week 9:	• Kinematics: Perform experiments to study motion and displacement of objects, including rectilinear and angular motion. • Velocity and Acceleration Analysis: Measure and analyze velocity and acceleration using motion sensors.

Week 10:	• Kinetics: Study the relationship between forces and motion through experiments based on Newton's laws of motion. • Impulse and Momentum: Measure impulse and momentum of objects in different scenarios and analyze the results.
Week 11:	• Work and Energy: Conduct experiments to explore work, energy, and power relationships in mechanical systems. • Conservation of Mechanical Energy: Verify the conservation of mechanical energy through experimental measurements.
Week 12:	• Power and Efficiency: Calculate and analyze power and efficiency in mechanical systems using experimental data. • Impact and Collision: Study the principles of impact and collision through experiments and observe the effects of different parameters.
Week 13:	• Rotational Dynamics: Perform experiments to study rotational dynamics, including moment of inertia and angular momentum. • Torque Measurement: Measure torque in different systems using torque sensors and analyze the relationship between torque and angular acceleration.
Week 14:	• Vibrations and Oscillations: Study free vibrations and harmonic motion through experiments with oscillating systems. • Damping Analysis: Investigate damping effects and resonance phenomena in mechanical systems and analyze their implications.
Week 15:	• Review and Recapitulation: Review the practical concepts covered throughout the course. • Problem-Solving Techniques: Apply problem-solving strategies to solve practical engineering mechanics problems and scenarios.
Week 16	• Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Bedford and W. Fowler, "Engineering Mechanics: Statics," 5th ed. Upper Saddle River, NJ: Pearson, 2008.	Yes
Recommended Texts	R. C. Hibbeler, "Engineering Mechanics: Dynamics," 14th ed. Boston, MA: Pearson, 2015.	No
Websites	The Collage E-Library	

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

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

الكلية التقنية الهندسية الكهربائية
Electrical Engineering Technical College

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**AC Electrical Circuits**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EET1204**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	ENG - EET		**College**	EETC	
Module Leader			**e-mail**		
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	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The module aims to: 1. To provide a comprehensive understanding of alternating current (AC), including its principles, characteristics, and waveform representation, as well as the significance of RMS value and average value in AC circuits. 2. To develop proficiency in working with phasor quantities, including their definition, representation in polar and rectangular forms, and the ability to perform arithmetic operations such as multiplication, division, addition, and subtraction. 3. To analyze resonance circuits, both in series and parallel configurations, in order to determine conditions for resonance, calculate key parameters such as current, voltage, impedance, phase angle, and frequency at resonance, and evaluate bandwidth and quality factor. 4. To investigate the impact of AC on different circuit configurations, ranging from resistance-only circuits to circuits with pure inductance or capacitance, as well as combinations of resistance, inductance, and capacitance. This includes determining phase angles between current and voltage for each circuit type. 5. To explore the concept of power in AC circuits, encompassing the calculation of power in circuits with various components (resistance, inductance, capacitance) in series and parallel. Additionally, to comprehend active and reactive power, power factor, and techniques to improve power factor. The course will also cover the application of theories such as Norton's theorem, Thevenin's theorem, and impedance matching in AC circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The module aims to achieve the following five learning outcomes: 1. Understand the fundamental principles of alternating current (AC) and its characteristics, including waveform representation, RMS value, average value, and their significance in electrical circuits. 2. Apply phasor analysis techniques to analyze AC circuits, including the representation of phasor quantities, calculation of phase angles, and performing arithmetic operations on phasors. 3. Analyze resonance circuits, both in series and parallel configurations, and determine key parameters such as current, voltage, impedance, phase angle, and bandwidth. 4. Evaluate the effect of alternating current on circuits with different combinations of resistance, inductance, and capacitance, including determining phase angles between current and voltage. 5. Understand power in AC circuits, including calculating active and reactive power, analyzing power factor and its impact on AC circuits, and applying relevant theorems and techniques for power measurement and analysis.
Indicative Contents المحتويات الإرشادية	The module may cover the following five indicative contents: Certainly! Here are five indicative contents for the AC Circuits module: 1. AC Quantities: [14 hrs.] • Definition and characteristics of alternating current. • Generation and waveform representation of AC. • Relationships and definitions of RMS value, average value, and their significance. • Finding the form factor and crest factor for irregular waveforms with

	practical examples. 2. Phasor Quantities: [14 hrs.] • Definition of phasor quantities. • Representation of phasors in polar and rectangular forms. • Calculation of phase angle. • Operations on phasor quantities including multiplication, division, addition, and subtraction with practical examples. 3. Resonance Circuits: [14 hrs.] • Series and parallel resonance circuits. • Definition and conditions for resonance. • Calculation of current, voltage, impedance, phase angle, and frequency at resonance. • Determining bandwidth and quality factor. • Graphical representation of the relationship between inductive and capacitive reactance with frequency • Example problems for both series and parallel resonance cases 4. Effect of Alternating Current on Circuits: [14 hrs.] • Analysis of circuits with resistance, inductance, and capacitance in different configurations (series, parallel). • Determining the phase angle between current and voltage in different circuit configurations. • Using theories such as Norton's theorem and Thevenin's theorem in AC circuits. • - Power calculations in AC circuits with different components (resistors, inductors, capacitors). 5. Three-Phase AC Circuits: [14 hrs.] • Definition and generation of three-phase AC current. • Connections in star and delta configurations in three-phase AC circuits. • Calculation of line current, phase current, total power, and line power in three-phase AC circuits. • Advantages of different connections in balanced and unbalanced loads. • Problem-solving examples for three-phase AC currents in delta and star connections.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The learning and teaching strategies for the AC Circuits module can vary depending on the specific educational institution and instructor. However, here are some common strategies that can be effective for teaching this module: • Lectures: Conducting lectures to introduce and explain fundamental concepts, principles, and theories related to AC circuits. This can include providing clear explanations, using visual aids such as slides or demonstrations, and engaging students through interactive discussions. • Practical Demonstrations: Organizing practical demonstrations or laboratory sessions where students can observe and interact with real AC circuits. This hands-on experience allows them to apply theoretical knowledge, perform measurements, and analyze circuit behavior. • Problem-Solving Sessions: Facilitating problem-solving sessions to enhance students' understanding of AC circuit analysis and calculation techniques. This involves presenting practice problems of increasing

	complexity and guiding students in step-by-step problem-solving strategies. • Simulations and Virtual Labs: Utilizing computer simulations and virtual laboratory environments to provide interactive and immersive experiences. This allows students to simulate and analyze AC circuits, observe waveforms, and manipulate circuit parameters, reinforcing their understanding of concepts and principles. • Group Discussions and Collaborative Learning: Encouraging group discussions and collaborative learning activities where students can actively engage with their peers. This can involve solving problems as a group, analyzing case studies, or engaging in debates and discussions to deepen their understanding of AC circuit concepts. • Multimedia Resources: Incorporating multimedia resources such as online videos, interactive animations, and virtual tools to supplement lectures and provide additional visual representations of AC circuit phenomena. • Assessments and Feedback: Implementing formative and summative assessments to evaluate students' understanding and progress. This can include quizzes, assignments, laboratory reports, and examinations. Providing timely feedback on assessments helps students identify areas of improvement and reinforces their learning. • Self-Study Materials: Recommending textbooks, reference materials, and online resources for students to further explore AC circuit concepts independently. This promotes self-directed learning and allows students to deepen their understanding at their own pace. By employing a combination of these strategies, instructors can create an engaging and effective learning environment for students studying AC circuits.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	106	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1:	AC Quantities: • Definition and characteristics of alternating current • Generation and waveform representation of AC • Relationships and definitions of RMS value, average value, and their significance • Finding the form factor and crest factor for irregular waveforms with practical examples
Week 2:	Phasor Quantities: • Definition of phasor quantities • Representation of phasors in polar and rectangular forms • Calculation of phase angle • Operations on phasor quantities including multiplication, division, addition, and subtraction with practical examples
Week 3:	Resonance Circuits: • Series and parallel resonance circuits • Definition and conditions for resonance • Calculation of current, voltage, impedance, phase angle, and frequency at resonance • Determining bandwidth and quality factor • Graphical representation of the relationship between inductive and capacitive reactance with frequency • Example problems for both series and parallel resonance cases
Week 4:	Effect of Alternating Current on Circuits: • Circuit with resistance only • Circuit with pure inductance only • Circuit with pure capacitance only • Determining the phase angle between current and voltage for each circuit with examples.
Week 5:	Effect of Alternating Current on Circuits: • Circuit with resistance and inductance in series • Circuit with resistance and capacitance in series • Circuit with resistance, inductance, and capacitance in series • Finding the relationship between current and voltage in the three cases, including phase angle and total circuit impedance, with practical examples.
Week 6:	Effect of Alternating Current on Circuits: • Circuit with resistance and inductance in parallel • Circuit with resistance and capacitance in parallel • Circuit with resistance, inductance, and capacitance in parallel

	• Finding the relationship between voltage and current in the three cases, including phase angle and total circuit impedance, with practical examples.
Week 7:	• Using the J-operator or the composite operator for finding total impedance, total admittance, current, voltage, and phase angle for resistors connected in series and parallel circuits, with example problem-solving.
Week 8:	• Application of theories such as Norton's theorem, Thevenin's theorem, and impedance matching in alternating current circuits, with example problem-solving.
Week 9:	• Power in AC circuits, including calculating power in circuits containing (resistance only, inductance only, capacitance only, resistance, inductance, and capacitance in series and parallel). Definition of active and reactive power and how to calculate them. • Total apparent power (definition), drawing the power triangle, power factor, its definition, and its effect on AC circuits. How to improve power factor with practical examples.
Week 10:	• Maximum power transfer theory in AC circuits, deriving the corresponding relationship with practical examples. • Analysis of electric networks using the nodal voltage method, introduction, nodal voltages, number of nodal voltage equations, nodal voltage equations by inspection, common tolerance, transition tolerance. • Practical examples of electric network analysis using the nodal method.
Week 11:	• Three-phase AC circuits, definition, and generation of three-phase AC current (single phase, two phases, three phases) with drawing the connections in star and delta configurations in three-phase AC circuits and the special relationships for calculating line current, phase current, total power, and line power, phase power. Advantages of each connection when used with balanced and unbalanced loads, with example problem-solving. • Solving practical examples regarding three-phase AC current with delta and star connections for balanced and unbalanced loads.
Week 12:	• Methods of power measurement for three-phase loads: Wattmeter, how to connect it to the circuit to measure active power and calculate reactive power and apparent power, with an example problem. Power measurement using a wattmeter and voltage, how to find total power using this method in both star and delta connections, using two watt meters, and using three watt meters.
Week 13:	• Transient cases in circuits: Transient cases in DC current, circuits in transient cases (RLC, RC, RL circuits). • Transient AC currents: Transient AC currents in RLC, RC, RL circuits, transient currents.
Week 14:	• Self-inductance of a coil (electromagnetic induction): Definition, special relationships to find self-inductance of a coil, mutual inductance between two coils, relationships to find mutual inductance based on the type of coil connection, including: a. Series-aiding connection and b. Series-opposing connection. • Transformers: Transformer construction, drawing the transformer, its characteristics, operating principle, and special relationships. Types of transformers and problem-solving.
Week 15:	• Growth and decay curves of current in an inductive circuit: Explanation of this circuit and its effect on DC current, general relationships for growth and decay of current in the coil, drawing the current and calculating the time constant, problem-solving. Charging and discharging capacitors, including the use of capacitance in DC circuits, general relationship for charging and discharging capacitors, drawing the current, the effect of the time constant, and its calculation, problem-solving.
Week 16	Preparatory week before the final Exam

	Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر
Week 1:	• Introduction to laboratory equipment and safety guidelines • The Oscilloscope: Comparison between peak and average values practically, calculating the form factor and crest factor (multiple exercises). • Series and parallel connections of RC and RL circuits.
Week 2:	• Phase angle measurement in series RLC circuits (multiple exercises). • Phase angle measurement in parallel RLC circuits (multiple exercises).
Week 3:	• Series resonance - Parallel resonance. • Verification of Norton and Thevenin theories in AC current.
Week 4:	• Comparison between analog voltmeter and electronic voltmeter in measuring DC and AC voltage (multiple exercises). • Achieving maximum power transfer in AC current - verifying the theory with its three possibilities.
Week 5:	• Power measurement using three voltmeters and ammeters (multiple exercises).
Week 6:	• Power and power factor measurement using a wattmeter (multiple exercises).
Week 7:	• Improving power factor (multiple exercises).
Week 8:	• Voltage and current in three-phase circuits (star and delta connections).
Week 9:	• Resistance measurement using a Wheatstone bridge (multiple exercises).
Week 10:	• Loaded voltage divider - Unloaded voltage divider.
Week 11:	• Resistance measurement using an ammeter and voltmeter (multiple exercises).
Week 12:	• Using amplifiers to measure high-value resistances (insulators) - (multiple exercises).
Week 13:	• Increasing the range of measurement for an ammeter - Calibration of the ammeter using another device.
Week 14:	• Increasing the range of measurement for a voltmeter - Calibration of the voltmeter.
Week 15:	• Studying the time constant for an inductive circuit (RL) - Studying the time constant for a capacitive circuit (RC).
Week 16	• Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	J. W. Nilsson and S. A. Riedel, "Electric Circuits," 11th ed. Boston, MA: Pearson, 2018.	Yes
Recommended Texts	E. M. Purcell, "Electricity and Magnetism," 3rd ed. Cambridge, MA: Cambridge University Press, 2013.	No
Websites	The Collage E-Library	

Engineering Technical College

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.

الكلية التقنية الهندسية الكهربائية
Electrical Engineering Technical College

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Workshops**			**Module Delivery**	
Module Type	**Basic**			☐ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EETC101**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	ENG - EET		**College**	EETC	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst. 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 Aims أهداف المادة الدراسية	The module aims of the Electrical and Mechanical Workshop module are as follows: 1. To provide students with a comprehensive understanding of the principles and practices involved in electrical and mechanical workshops. 2. To familiarize students with the safety measures and precautions required in electrical and mechanical workshop environments. 3. To develop students' practical skills in using tools and equipment commonly used in electrical and mechanical workshops. 4. To introduce students to various electrical and mechanical processes, such as turning, filing, drilling, welding, and assembly. 5. To enhance students' knowledge of different types of machines, instruments, and materials used in electrical and mechanical workshops. 6. To provide hands-on experience and practical training in performing tasks related to electrical and mechanical workshop operations. 7. To develop students' problem-solving skills and critical thinking abilities through practical applications and troubleshooting scenarios. 8. To foster teamwork and effective communication skills by engaging students in group projects and collaborative workshop activities. 9. To instill an understanding of professional ethics and responsibility in the context of electrical and mechanical workshop practices. 10. To prepare students for future academic and professional pursuits in the fields of electrical engineering, mechanical engineering, and related disciplines.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The module learning outcomes for the Electrical and Mechanical Workshop module are as follows: 1. Knowledge and Understanding: a. Demonstrate a comprehensive understanding of the principles and concepts related to electrical and mechanical workshop operations. b. Identify and explain the safety measures and regulations applicable to electrical and mechanical workshops. c. Describe the different tools, machines, and materials used in electrical and mechanical workshops. 2. Practical Skills: a. Apply safe working practices and use appropriate personal protective equipment (PPE) in electrical and mechanical workshop environments. b. Demonstrate proficiency in using various tools and equipment for turning, filing, drilling, welding, and assembly. c. Perform practical tasks related to electrical and mechanical workshop operations accurately and efficiently. d. Apply problem-solving techniques to troubleshoot and rectify common issues encountered in electrical and mechanical workshop activities. 3. Critical Thinking and Analysis: a. Analyze and evaluate different turning processes, instrumentation measures, and cutting tools used in the workshop. b. Assess the quality of filing processes and choose appropriate rasps and tools for different filing tasks. c. Evaluate the drilling processes and select suitable drilling tools based on specific requirements. d. Analyze welding processes, including oxy-acetylene and arc welding, and determine safety precautions and best practices. 4. Communication and Collaboration: a. Effectively communicate and collaborate with peers in group projects and workshop activities. b. Present findings, results, and recommendations related to electrical and mechanical workshop tasks in a clear and concise manner. 5. Professional and Ethical Responsibility: a. Demonstrate ethical behavior and responsibility in adhering to safety regulations, environmental considerations,

	and industry standards in electrical and mechanical workshop practices. b. Recognize the importance of continuous learning and professional development in the field of electrical and mechanical engineering.
Indicative Contents المحتويات الإرشادية	1. Principles of Industrial Safety in Electrical Workshops[6 hrs.] • Electrical shock protection and safety measures. • Workshop safety rules and regulations. • Personal protective equipment (PPE) and its usage. • Emergency procedures and first aid. 2. Tools Used in Electrical Workshops[6 hrs.] • Introduction to common tools used in electrical workshops. • Proper handling and usage techniques for tools. • Safety precautions while using tools. • Maintenance and care of tools. 3. Power Sources and Characteristics[6 hrs.] • Different types of power sources used in electrical systems. • AC and DC power, voltage, current, and frequency. • Power generation and distribution systems. • Power quality and factors affecting it. 4. Multimeter and Wire Size Measurement[6 hrs.] • Introduction to multimeters and their functions. • Measurement of wire sizes using a multimeter. • Determining wire gauge and current-carrying capacity. • Practical exercises on measuring wire sizes. 5. Different Types of Welding Irons and Spot Welding[6 hrs.] • Overview of welding irons with different capacities. • Techniques for using different types of welding irons. • Spot welding process and applications. • Safety considerations during welding operations. 6. Electric Transformers[6 hrs.] • Introduction to electric transformers and their principles. • Types of transformers (e.g., step-up, step-down, isolation). • Magnetic circuits and transformer cores. • Transformer operation and efficiency. 7. Electric Circuits and Transformer Operation[6 hrs.] • Opening transformers and gathering information from old transformers. • Primary and secondary windings in transformers. • Measurement of wire diameters in transformer windings. • Basic electric circuit analysis and troubleshooting. 8. Types of Electric Motors[6 hrs.] • Single-phase and three-phase electric motors. • Shaded pole motors and their applications. • Motor operation, speed control, and efficiency. • Motor protection devices and thermal overload relays 9. Electrical Installations and Wiring Techniques[6 hrs.] • Types of electrical installations (surface and concealed). • Wiring methods and techniques for different installations. • Siemens wiring system and components • Drawing and interpreting electrical wiring diagrams. 10. Lighting Circuits and Control[6 hrs.] • Designing lighting circuits with control circuits. • Wiring lamps in parallel and series configurations. • Practical exercises on wiring lighting circuits.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The learning and teaching strategies for the Electrical and Mechanical Workshop module may include: 1. Lectures: The module may include lectures delivered by the instructor to introduce and explain the theoretical concepts, principles, and procedures related to electrical and mechanical workshop practices. Lectures can provide an overview of the topics, highlight key points, and provide examples and case studies. 2. Practical Demonstrations: Hands-on practical demonstrations can be conducted by the instructor to show students the proper usage of tools and equipment, safety precautions, and step-by-step procedures for various workshop tasks. This allows students to observe and understand the practical aspects of the subject. 3. Laboratory Sessions: Laboratory sessions provide students with the opportunity to apply their theoretical knowledge and practice their skills in a controlled workshop environment. Students can work on assigned tasks, conduct experiments, perform measurements, and troubleshoot electrical and mechanical systems under the guidance of the instructor. 4. Group Discussions: Group discussions can be facilitated to encourage active participation and collaboration among students. Students can discuss and analyze case studies, share their experiences, and exchange ideas and perspectives on workshop-related topics. This promotes critical thinking, problem-solving, and peer learning. 5. Workshops and Work-Based Learning: Organizing workshops and incorporating work-based learning experiences can enhance the practical skills of students. This may involve site visits to real-world electrical and mechanical workshops, where students can observe professional practices, interact with industry experts, and gain hands-on experience in a professional setting. 6. Assignments and Projects: Assignments and projects can be assigned to students to further deepen their understanding of the subject matter. This may include tasks such as designing electrical installations, troubleshooting circuits, creating wiring diagrams, or conducting research on specific workshop-related topics. These assignments promote independent learning, research skills, and practical application of knowledge. 7. Assessments: Various forms of assessments can be used to evaluate students' understanding and progress. These may include written exams, practical assessments, laboratory reports, project presentations, and quizzes. Assessments provide feedback to students and allow them to demonstrate their knowledge, skills, and problem-solving abilities.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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)	6, 14	LO #1, 2, 8 and 9
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	14	LO # 1-14
Summative assessment	**Midterm Exam**	2 hours	10% (10)	7	LO # 1-7
	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Workshop Syllabus) المنهاج الاسبوعي للورشة	
	Material Covered
Electrical Engineering Workshop	
Week 1:	Principles of Industrial Safety in Electrical Workshops. • Electrical shock protection and safety measures. • Familiarization with tools used in electrical workshops. • Power sources and their characteristics. • Training on the use of a multimeter for measuring wire sizes.
Week 2:	Different Types of Welding Irons (with different capacities) and Spot Welding • Proper usage techniques for different types of welding irons, including spot welding. • Introduction to electric transformers and their types. • Magnetic circuits in transformers.
Week 3:	Electric Circuits and Transformer Operation. • Opening transformers and gathering information from the old transformer for primary and secondary windings. • Measurement of wire diameters for the transformer. • Types of electric motors (single-phase and three-phase), example of shaded pole motor (small water pump motor).
Week 4:	Electrical Installations and Types of Wiring (Surface and Concealed) • Types of electrical installations (surface and concealed). • Concealed wiring within pipes. • Siemens wiring installation. • Drawing a lighting installation circuit with control circuit. • Practical exercise on wiring installation.
Week 5:	Parallel Wiring of Two Lamps with a Switch and Socket • Drawing a circuit diagram for two lamps wired in parallel with a switch and socket. • Practical application of the circuit. • Drawing the internal connection for a fluorescent lamp circuit. • Replacing one lamp with a fluorescent lamp.
Week 6:	Drawing a Staircase Lamp (Two-Way Switch) Circuit • Drawing a circuit diagram for a staircase lamp with two-way switches. • Practical application of the circuit.
Week 7:	Introduction to Electrical Relays, Types, Uses, Thermal Overload Relays, Time Delay Relays • Understanding electrical relays and their types.

	• Applications and uses of relays. • Thermal overload relays and time delay relays.
Week 8:	Operation of Single-Face Motor with an Air Pick-Up and Push Button • Operating a single-face motor using an air pick-up and push button. • Operating the motor and changing its direction of rotation using relays and a time delay.
Mechanical Engineering Workshop	
Week 9:	Introduction to Workshop Safety • Discuss the importance of safety in workshop environments. • Cover safety rules, personal protective equipment (PPE), emergency procedures, and hazardous material handling.
Week 10:	Turning Process and Instrumentation Measures • Explain the basics of the turning process, including lathe machine components and operations. • Discuss instrumentation measures used in turning, such as calipers, micrometers, and dial indicators.
Week 11:	Cutting Tools in Turning • Introduce different types of cutting tools used in turning, including lathe tools, inserts, and tool holders. • Explain tool geometry, selection criteria, and tool life considerations.
Week 12:	Practical Exercise - Horizontal Turning • Demonstrate horizontal turning on a lathe machine. • Guide students in practicing turning operations, such as facing, turning, and grooving, using appropriate cutting tools.
Week 13:	Turning Different Shapes • Teach students how to turn different shapes, such as tapers, chamfers, and threads, on the lathe machine. • Cover techniques for creating internal and external threads and other complex shapes.
Week 14:	Introduction to Filing Process • Introduce the filing process and its applications in workshop activities. • Explain different types of files and their uses, including hand files, needle files, and rasp files.
Week 15:	Practical Exercise - Filing Process • Guide students in practicing filing techniques on various materials. • Demonstrate the correct filing motions, angles, and finishing methods for different surfaces and edges.
Week 16	• **Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	J. Smith and E. Johnson, "Electrical Engineering Workshop: Theory and Practice," .	Yes
Recommended Texts	D. Wilson and S. Thompson, "Mechanical Engineering Workshop: Principles and Applications," . عباس شياع علوان، سمير خلف فياض، أيناس عبد الكريم خالد،" أسس الورش الهندسية" مطبعة جامعة بغداد، رقم الايداع 3962 لسنة 2019	No
Websites	E-Library	

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

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

الكلية التقنية الهندسية الكهربائية
Electrical Engineering Technical College

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Engineering Drawing**			**Module Delivery**	
Module Type	**Basic**			☐ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EETC102**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	ENG - EET		**College**	EETC	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst. Professor		**Module Leader's Qualification**	M.A.	
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 Aims أهداف المادة الدراسية	The module aims for the Basics of Engineering Drawing course are as follows: 1. To demonstrate proficiency in creating and interpreting engineering drawings: Develop the skills to create accurate and detailed engineering drawings using both manual drafting techniques and computer-aided drafting (CAD) software. Additionally, gain the ability to interpret and understand engineering drawings, including orthographic projections, sections, and assembly drawings. 2. To apply industry standards and practices: Understand and apply the relevant industry standards and practices for engineering drawing, such as dimensioning, tolerancing, and geometric dimensioning and tolerancing (GD&T). Ensure that drawings are compliant with applicable standards to facilitate effective communication and manufacturing processes. 3. To develop spatial visualization skills: Enhance your ability to visualize and mentally manipulate objects in three-dimensional space based on two-dimensional drawings. Strengthen your spatial awareness and improve your understanding of complex engineering designs. 4. To demonstrate effective communication of technical information: Acquire the skills to communicate technical information clearly and accurately through annotations, notes, and drawing presentations. Enhance your ability to convey design intent, dimensions, and specifications to other stakeholders, such as engineers, manufacturers, and clients. 5. To apply critical thinking and problem-solving skills in engineering drawing: Develop the ability to analyze and solve engineering drawing problems, such as identifying and resolving dimensional conflicts, addressing design issues, and ensuring proper fit and function of components. Apply critical thinking skills to evaluate and improve the quality and accuracy of engineering drawings.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Develop Fundamental Skills: The aim is to develop fundamental skills in engineering drawing, including the ability to create accurate and precise technical drawings using appropriate drawing instruments and techniques. 2. Understand Drawing Standards and Conventions: The aim is to familiarize students with drawing standards and conventions used in engineering, enabling them to create drawings that adhere to industry guidelines and ensure clear communication of design intent. 3. Interpret and Create Orthographic Projections: The aim is to enable students to interpret and create orthographic projections of objects, including understanding the principles of multiview projection, selecting appropriate views, and accurately representing three-dimensional objects in two dimensions. 4. Apply Dimensioning and Tolerancing Principles: The aim is to develop students' ability to apply dimensioning and tolerancing principles to

	engineering drawings, including understanding different types of dimensions, tolerance symbols, and geometric dimensioning and tolerancing (GD&T) concepts. 5. Familiarize with Computer-Aided Design (CAD): The aim is to introduce students to computer-aided design (CAD) software and develop their proficiency in using CAD tools to create and modify technical drawings, improving efficiency and accuracy in engineering design and documentation.
Indicative Contents المحتويات الإرشادية	**1. Introduction to engineering drawing: [12 hrs]** • Overview of the role and significance of engineering drawing in technical fields. • Introduction to different drawing tools and their uses. • Understanding the importance of accuracy and clarity in engineering drawings. **2. Orthographic projections and multiview drawings: [12 hrs]** • Principles and techniques of orthographic projection. • Creating and interpreting multiview drawings, including front, top, and side views. • Introduction to auxiliary views and sectional views. **3. Dimensioning and tolerancing: [12 hrs]** • Understanding dimensioning practices and techniques. • Introduction to geometric dimensioning and tolerancing (GD&T) symbols and concepts. • Applying tolerances to ensure proper fit and functionality of components. **4. Computer-aided drafting (CAD) software: [12 hrs]** • Introduction to CAD software and its applications in engineering drawing. • Learning basic commands and tools for creating and modifying drawings. • Hands-on practice with CAD software to create technical drawings. **5. Assembly drawings and exploded views: [11 hrs]** • Creation and interpretation of assembly drawings. • Understanding exploded views to visualize the relationship between parts. • Introduction to bill of materials (BOM) and part lists in assembly drawings.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	When it comes to learning and teaching engineering drawing using AutoCAD, there are several strategies that can be effective. Here are some recommendations: 1. Familiarize with the Software: Before diving into engineering drawing concepts, it's important to become familiar with the AutoCAD software. This includes understanding the user interface, basic tools, and commands. Start with introductory tutorials or online resources that cover the basics of AutoCAD. 2. Start with Fundamentals: Begin by teaching the fundamental concepts of engineering drawing, such as orthographic projection, isometric projection, dimensioning, and tolerancing. Explain the principles and techniques used in creating accurate and clear technical drawings.

	3. Hands-on Practice: Engineering drawing is a practical skill, so provide ample opportunities for hands-on practice. Assign exercises and projects that require students to create different types of drawings using AutoCAD. Encourage them to explore and experiment with various tools and commands. 4. Step-by-Step Instructions: Break down complex drawing tasks into smaller, manageable steps. Provide step-by-step instructions and demonstrations using AutoCAD, showing students how to execute each step effectively. This approach helps students understand the workflow and build their confidence. 5. Visual Aids and Examples: Utilize visual aids, such as slides, diagrams, and examples, to reinforce concepts. Show real-world engineering drawings and explain how they were created using AutoCAD. Visual representations can enhance understanding and make abstract concepts more tangible. 6. Group Activities and Collaboration: Promote collaboration among students by assigning group activities or projects. This allows them to work together, share knowledge, and learn from one another. Encourage students to discuss their approaches and problem-solving techniques related to engineering drawing in AutoCAD. 7. Provide Feedback: Regularly provide constructive feedback on students' drawings. Highlight areas for improvement, suggest alternative methods, and point out common mistakes. This feedback loop is crucial for students to refine their skills and develop a deeper understanding of engineering drawing principles. 8. Stay Updated with AutoCAD Features: AutoCAD is regularly updated with new features and enhancements. Stay up to date with these changes to ensure you're teaching the latest tools and workflows. Familiarize yourself with new capabilities that can improve efficiency and accuracy in engineering drawing. 9. Online Resources and Communities: Encourage students to explore online resources, tutorials, and communities dedicated to AutoCAD and engineering drawing. There are numerous websites, forums, and YouTube channels that offer valuable content and support for learning AutoCAD. 10. Project-Based Learning: Incorporate project-based learning into the curriculum, where students can apply their engineering drawing skills to real-world scenarios. Assign projects that simulate industry-related tasks, such as creating architectural plans, mechanical assemblies, or electrical schematics using AutoCAD.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Engineering Drawing: • Importance and applications of engineering drawing. • Drawing instruments and materials. Drawing standards and conventions.
Week 2:	Lines and Lettering • Types of lines used in engineering drawing. • Line weights and line quality. Techniques for freehand lettering and title block.
Week 3:	Geometric Construction • Basic geometric shapes and their construction methods. • Construction of angles, triangles, and polygons. Division of lines and angles.
Week 4:	Orthographic Projection • Introduction to orthographic projection. • Multiview projection and views of an object. Drawing orthographic views of simple objects.
Week 5:	Sectional Views • Introduction to sectional views. • Types of sectional views (full, half, offset). Drawing sectional views of objects.
Week 6:	Dimensioning and Tolerancing • Introduction to dimensioning and tolerancing. • Types of dimensions (linear, angular, radial). Geometric dimensioning and tolerancing (GD&T).
Week 7:	Auxiliary Views: • Introduction to auxiliary views. • Drawing auxiliary views to show true shape and size of inclined surfaces.

	• Solving problems using auxiliary views.
Week 8:	Pictorial Drawings • Introduction to pictorial drawings (isometric, oblique, perspective). • Drawing isometric and oblique pictorial views. Creating exploded views.
Week 9:	Screw Threads and Fasteners • Introduction to screw threads. • Types of screw threads and thread representation. Drawing standard fasteners (bolts, nuts, screws).
Week 10:	Assembly Drawings • Introduction to assembly drawings. • Drawing exploded views and assembly details. Bill of materials (BOM) and part numbering.
Week 11:	Introduction to CAD (Computer-Aided Design) • Overview of CAD software and its benefits. • Introduction to basic CAD tools and commands. Creating simple drawings using CAD software.
Week 12:	• Isometric Projection • Introduction to isometric projection. • Drawing isometric views of simple objects. Solving problems using isometric projection.
Week 13:	Electrical and Electronic Symbols • Introduction to electrical and electronic symbols. • Drawing basic electrical and electronic circuits. Wiring diagrams and schematic symbols.
Week 14:	Engineering Drawings for Manufacturing • Introduction to manufacturing drawings. • Drawing detailed views and dimensioning for manufacturing. Introduction to tolerances and fits.
Week 15:	Review and Project Work • Review of course topics and concepts. • Project work involving the application of engineering drawing principles.

Learning and Teaching Resources

مصادر التعلم والتدريس

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

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

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

الكلية التقنية الهندسية الكهربائية
Electrical Engineering Technical College

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Arabic Language**			**Module Delivery**	
Module Type	**Support or related learning activity**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MTU1001**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	ENG - EET		**College**	EETC	
Module Leader			**e-mail**		
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	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	أهداف المادة الدراسية هي اني يكون الطالب قادراً على أن : 1. يتعرف على أنواع الأخطاء اللغوية المشتركة وتوضيح أسبابها وكيفية تجنبها. 2. يتعلم القواعد المتعلقة بالتاء المربوطة والطويلة والتاء المفتوحة وكيفية كتابتها بشكل صحيح. 3. يتعلم قواعد كتابة الألف الممدودة والمقصورة واستخدام الحروف الشمسية والقمرية بشكل صحيح. 4. التعرف على الضاد والظاء ومعرفة كيفية التمييز بينهما في الكتابة. 5. يتعلم طرق كتابة الهمزة بشكل صحيح وفقًا للقواعد اللغوية. 6. التعرف على علامات الترقيم واستخدامها بشكل صحيح في النصوص. 7. يفهم الفروق بين الاسم والفعل والتمييز بينهما في الجمل. 8. يفهم المفاعيل و كيفية استخدامها بشكل صحيح في النصوص. 9. يتعلم الأرقام والعدد واستخدامها في التعبير عن الكميات. 10. يتجنب الأخطاء اللغوية الشائعة في سياقات عملية لتعزيز فهم القواعد وتحسين المهارات اللغوية. 11. يدرس النون والتنوين وفهم معاني حروف الجر واستخدامها بشكل صحيح في الجمل. 12. يركز على الجوانب الشكلية للخطاب الإداري وكيفية كتابته بأسلوب صحيح ومناسب. 13. التعرف على لغة الخطاب الإداري وفهم استخدامها في التواصل الإداري. 14. يفهم نماذج من المراسلات الإدارية لتطبيق المفاهيم والمهارات المكتسبة في الخطاب الإداري.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات التعلم للمادة الدراسية هي: 1. قدرة الطلاب على تحليل وتعريف الأخطاء اللغوية المشتركة وتطبيق القواعد الصحيحة لتجنبها. 2. القدرة على استخدام القواعد اللغوية المتعلقة بالتاء المربوطة والطويلة والتاء المفتوحة بشكل صحيح. 3. قدرة الطلاب على استخدام الألف الممدودة والمقصورة بشكل صحيح واستخدام الحروف الشمسية والقمرية بطريقة صحيحة. 4. تمكين الطلاب من التمييز بين الضاد والظاء وتطبيق القواعد الصحيحة في الكتابة. 5. القدرة على كتابة الهمزة بشكل صحيح وفقًا للقواعد اللغوية. 6. استخدام علامات الترقيم بشكل صحيح في النصوص المكتوبة. 7. فهم الطلاب للفروق بين الاسم والفعل وتمكينهم من استخدامهما بشكل صحيح في الجمل. 8. القدرة على استخدام المفاعيل بشكل صحيح في النصوص المكتوبة. 9. استخدام الأرقام والعدد بطريقة صحيحة للتعبير عن الكميات. 10. التمكن من تطبيق الأخطاء اللغوية الشائعة في سياقات عملية وتصحيحها بشكل مناسب. 11. فهم استخدام النون والتنوين ومعاني حروف الجر واستخدامها بشكل صحيح في الجمل. 12. القدرة على كتابة الخطاب الإداري بأسلوب صحيح ومناسب وفهم لغة الخطاب الإداري. 13. تطبيق المفاهيم والمهارات المكتسبة في كتابة المراسلات الإدارية بشكل صحيح وفعال.
Indicative Contents المحتويات الإرشادية	المحتويات الإرشادية في مادة اللغة تشمل مجموعة من المفاهيم والمواضيع التي يتم تغطيتها خلال عملية التعلم. ومن بين المحتويات الإرشادية المهمة: 1. مقدمة عن الأخطاء اللغوية والتعريف بالتاء المربوطة والتاء المطوَّلة والتاء المفتوحة. (4 ساعات) 2. قواعد كتابة الألف الممدودة والمقصورة والتعرف على الحروف الشمسية والقمرية. (4 ساعات) 3. دراسة الضاد والظاء وتعلم طرق كتابتهما بشكل صحيح. (4 ساعات) 4. تعلم كتابة الهمزة بشكل صحيح وفقًا للقواعد اللغوية. (4 ساعات) 5. دراسة علامات الترقيم وتعلم استخدامها بشكل صحيح في النصوص اللغوية. (4 ساعات) 6. التعرف على الاسم والفعل والتفريق بينهما وفهم القواعد المتعلقة بهما. (4 ساعات) 7. دراسة المفاعيل وتعلم استخدامها في الجمل اللغوية. (4 ساعات) 8. التعرف على الأعداد واستخدامها بشكل صحيح في العبارات والجمل. (4 ساعات) 9. دراسة الأخطاء اللغوية الشائعة وتطبيقاتها في النصوص اللغوية. (4 ساعات) 10. تعلم استخدام النون والتنوين وفهم معاني حروف الجر واستخدامها بشكل صحيح في الجمل. (3 ساعات) 11. التعرف على الجوانب الشكلية للخطاب الإداري وفهم لغته وقواعده. (3 ساعات) 12. دراسة نماذج من المراسلات الإدارية وتطبيقها في الكتابة. (3 ساعات) توفر هذه المحتويات الإرشادية للطلاب فهمًا شاملاً للمفاهيم اللغوية وتعلم القواعد والتطبيقات العملية التي تساعدهم في تطوير مهاراتهم اللغوية.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي 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, 8 and 9
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	10% (10)	14	LO # 1-14
Summative assessment	**Midterm Exam**	2 hours	20% (10)	7	LO # 1-7
	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري		
الأسبوع الأول	مقدمة عن الأخطاء اللغوية –التاء المربوطة والطويلة والتاء المفتوحة	8-1
الأسبوع الثـــاني	قواعد كتابة الالف الممدودة والمقصورة – الحروف الشمسية والقمرية	14-9
الاسبوع الثـــالث	الضاد والظاء	19-15
الأسبوع الـــرابـع	كتابة الهمزة	30-20
الأسبوع الخـــامس	علامات الترقيم	36-31
الأسبوع الســـادس	الاسم والفعل والتفريق بينهما	44-37
الأسبوع الســـابع	المفاعيل	50-45
الأسبوع الثـــامن	العـــدد	61-51
الأسبوع التاسع والعاشر	تطبيقات الأخطاء اللغوية الشائعة	69-62
الاسبوع الحادي عشر	النون والتنوين ـ معاني حروف الجر	75-70
الاسبوع الثاني عشر	الجوانب الشكلية للخطاب الإداري	80-76
الأسبوع الثالث عشر والرابـــع عشر	لغة الخطاب الإداري	86-81
الأسبوع الرابع عشر	نماذج من المراسلات الإدارية	
الأسبوع الخامس عشر	الاستعداد للأمتحان النهائي	

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

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**English Language (Beginner)**			**Module Delivery**	
Module Type	**Support or related learning activity**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MTU1002**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	ENG – EET		**College**	EETC	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst. Professor		**Module Leader's Qualification**	M.A.	
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 Aims أهداف المادة الدراسية	The module aims of English Language (Beginner) are designed to help learners at the beginner level develop their English language skills and achieve specific learning objectives. While I don't have access to the specific module aims of this coursebook, I can provide you with a general outline of the typical aims for a beginner-level English course: 1. To introduce beginner-level learners to the English language, focusing on building vocabulary and acquiring essential language structures. 2. To develop listening and speaking skills through interactive activities and engaging in basic conversational practice. 3. To enhance reading comprehension abilities by introducing simple texts and emphasizing vocabulary and sentence structures. 4. To provide foundational writing skills, including sentence formation, paragraph writing, and completing basic forms. 5. To cultivate cultural awareness and equip learners with practical language skills for everyday situations, such as ordering food, shopping, and asking for directions.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	The module learning outcomes for the English Language (Beginner) module are as follows: 1. Develop basic proficiency in listening and understanding spoken English at a beginner level. 2. Demonstrate improved speaking skills by participating in simple conversations and expressing basic ideas and opinions. 3. Comprehend and interpret basic written texts, including short passages and simple dialogues. 4. Produce written texts using basic grammatical structures and vocabulary appropriate for beginner-level communication. 5. Increase vocabulary knowledge and usage to effectively communicate in everyday situations. 6. Develop an awareness of cultural aspects related to English-speaking countries and demonstrate cross-cultural understanding in language use. 7. Apply basic language skills in practical situations, such as greetings, introductions, making requests, and asking for and giving simple directions.
Indicative Contents المحتويات الإرشادية	Unit 1: Hello! [3 hrs.] Unit 2: Your world. [3 hrs.] Unit 3: All about you. [3 hrs.] Unit 4: Family and friends. [3 hrs.] Unit 5: The way I live. [3 hrs.] Unit 6: Every day[3 hrs.] Unit 7: My favourites. [3 hrs.] Unit 8: Where I live, Times past. [3 hrs.] Unit 9: We had a great time!, I can do that! [3 hrs.] Unit 10: Please and thank you, Here and now. [3 hrs.] Unit 11: It's time to go!, Getting to know you. [3 hrs.] Unit 12: The way we live, It all went wrong. [3 hrs.] Unit 13: Let's go shopping! [3 hrs.] Unit 14: What do you want to do? [3 hrs.] Unit 15: Tell me! What's it like? [3 hrs.]

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

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

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
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, 8 and 9
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	10% (10)	14	LO # 1-14
Summative assessment	**Midterm Exam**	2 hours	20% (10)	7	LO # 1-7
	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• Hello!
Week 2	• Your world.
Week 3	• All about you.
Week 4	• Family and friends.
Week 5	• The way I live.
Week 6	• Every day
Week 7	• My favourites.
Week 8	• Where I live. • Times past.
Week 9	• We had a great time! • I can do that!
Week 10	• Please and thank you. • Here and now.
Week 11	• It's time to go! • Getting to know you.
Week 12	• The way we live. • It all went wrong.
Week 13	• Let's go shopping!
Week 14	• What do you want to do?
Week 15	• Tell me! What's it like?
Week 16	• Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	• Soars, J., Soars, L. (2014). New Headway Plus: Beginner Student's Book. United Kingdom: Oxford University Press. • Soars, J., Soars, L. (2006). New Headway Plus: Pre-intermediate. United Kingdom: Oxford University Press.	Yes
Recommended Texts	Audio CDs or Online Audio: Recordings of listening exercises, dialogues, and pronunciation practice.	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.

الكلية التقنية الهندسية الكهربائية
Electrical Engineering Technical College

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Principles**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MTU1004**				
ECTS Credits	**3**				
SWL (hr/sem)	**75**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	ENG – EET		**College**	EETC	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst. 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 Aims أهداف المادة الدراسية	The module aims to: 1. To introduce students to the fundamental concepts of computers, including their evolution, advantages, and classification based on purpose, size, and data type. 2. To familiarize students with the physical components of a computer and software entities, highlighting their roles in computer operations. 3. To promote awareness of computer security, ethics, and intellectual property rights, emphasizing the types of violations and measures for protection. 4. To provide an overview of operating systems, their functions, classifications, and examples, with a focus on the Windows 11 operating system and its desktop components. 5. To equip students with practical knowledge of computer usage and maintenance, covering file organization, software installation, common computer settings, and promoting responsible practices. 6. These aims and indicative contents aim to achieve a comprehensive understanding of computer fundamentals, security, operating systems, and proper computer usage and maintenance.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the module, students should be able to: 1. Demonstrate a comprehensive understanding of computer fundamentals, including the concept of a computer, stages of the computer life cycle, and advantages of computers. 2. Classify computers based on their purpose, size, and data type, and identify the physical components and software entities of a computer system. 3. Apply ethical principles in the digital world and understand the importance of computer security, software licenses, and protecting against hacking and cyber intrusions. 4. Recognize the health effects of computer usage and implement ergonomic practices for a safe and healthy computing environment. 5. Understand the role and objectives of operating systems, classify different types of operating systems, and demonstrate proficiency in using the Windows 11 operating system. 6. Utilize common desktop components, navigate file systems, manage programs and settings, and perform basic file organization and maintenance tasks.
Indicative Contents المحتويات الإرشادية	1. Introduction to Computer Fundamentals and Classification [14 hrs.] • Concept of a computer • Stages of the computer life cycle • Evolution of computer generations • Advantages of computers and their applications • Classification of computers based on purpose, size, and data type. 2. Computer Components and Software Entities[14 hrs.] • Physical components of a computer • Introduction to software entities 3. Computer Security, Ethics, and Intellectual Property[14 hrs.] • Concept of computer security • Software licenses and intellectual property • Ethics in the digital world • Types of violations and cyber intrusions • Protecting against hacking 4. Health Effects of Computers and Ergonomics [14 hrs.]

	• Understanding and mitigating health risks associated with computer use. • Importance of ergonomics and safe computing practices 5. Operating Systems and Desktop Operations[14 hrs.] • Introduction to operating systems • Functions and objectives of operating systems • Classification of operating systems • Overview of the Windows 11 operating system • Desktop components and operations • Control Panel categories and functions • File organization and maintenance
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The learning and teaching strategies for the module on Computer Principles and operating systems can include: 1. Lectures and Presentations: The instructor can deliver lectures and presentations to introduce and explain key concepts, theories, and principles related to computer fundamentals and operating systems. This can help students develop a foundational understanding of the subject matter. 2. Practical Demonstrations: Hands-on practical demonstrations can be conducted to illustrate the usage of different computer components, software applications, and operating system functionalities. This can enhance students' understanding of the practical aspects of computer systems. 3. Group Discussions and Collaborative Learning: Engaging students in group discussions and collaborative learning activities can promote active participation and deeper understanding. Students can discuss and analyze case studies, real-life examples, and scenarios related to computer fundamentals and operating systems. 4. Laboratory Exercises: Practical laboratory exercises can provide students with opportunities to apply their knowledge and skills in a controlled environment. They can work on computer hardware, software installations, operating system configurations, and troubleshooting tasks, allowing them to gain practical experience. 5. Assignments and Projects: Assignments and projects can be assigned to students to encourage independent learning and critical thinking. They can involve research, analysis, problem-solving, and the application of concepts learned in the module. This can help students develop their skills and deepen their understanding.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	49	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	26	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	• Introduction to Computer Fundamentals. • Concept of a Computer.
Week 2	• Stages of the Computer Life Cycle. • Evolution of Computer Generations.
Week 3	• Advantages of Computers and their Applications. • Classification of Computers based on Purpose, Size, and Data Type.
Week 4	• Computer Components: Physical Components of a Computer. • Computer Components: Software Entities.
Week 5	• Personal Computers. • Concept of Computer Security and Software Licenses.
Week 6	• Software Licenses: Types and Importance. • Intellectual Property.
Week 7	• Software Licenses: Types and Importance. • Intellectual Property.
Week 8	• Cyber Intrusions and Malicious Software. • Steps for Protecting Against Hacking.
Week 9	• Health Effects of Computers. • Introduction to Operating Systems.
Week 10	• Functions and Objectives of Operating Systems. • Classification of Operating Systems.
Week 11	• Examples of Different Operating Systems. • Windows 11 Operating System.
Week 12	• Desktop Components. • Start Menu and Taskbar.
Week 13	• Folders and Files. • Icons and Operations on Windows.
Week 14	• Desktop Wallpapers.

	• Control Panel: Categories and Functions. • File Organization and Maintenance.
Week 15	• Installing and Uninstalling Programs. • Common Computer Settings: Printer Management, Time and Date Settings, Primary Disk Maintenance.
Week 16	• Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	• Practical examples of browsing, opening, and closing windows and dialog boxes, and the proper way to interact with the keyboard, cursor, and other devices. Computer Fundamentals: Concept of a Computer, Stages of the Computer Life Cycle, Evolution of Computer Generations.
Week 2	• Practical examples of customization, working with icons, and changing screen resolution. Computer Advantages and Applications, Classification of Computers based on Purpose, Size, and Data Type.
Week 3	• Training the student on creating a new user, maximizing windows, displaying the keyboard, and familiarizing with the physical components of the computer. Computer Components: Physical Components of a Computer, Software Entities.
Week 4	• Training the student on dealing with computer software licenses, their types, and handling original software sources. Your Personal Computer: Concept of Computer Security and Software Licenses.
Week 5	• Training the students in computer security. Computer Safety & Software Licenses, Computer Safety, and Security.
Week 6	• Training the student in computer privacy. Ethics in the Digital World, Types of Violations, Computer Security, Computer Privacy.
Week 7	• Training the student on electronic hacking and its types, types and characteristics of viruses, how to create a computer backup for protection. Software Licenses: Types and Importance, Intellectual Property, Cyber Intrusions and Malicious Software, Steps for Protecting Against Hacking, Harmful Effects of Computers on Health.
Week 8	• Training the student on operating systems, configuring, and partitioning the internal and external hard disk. Operating Systems: Definition, Functions, Objectives, Classification, Examples of Different Operating Systems.
Week 9	• Training the student in installing Windows 7. Operating Systems: Windows 11.
Week 10	• Training the student on Start Menu commands, the taskbar, creating a file, and saving it with the student's name on the desktop. Interacting with windows, scrollbars, and using the function keys (F1, F2, ..., F12) on the keyboard. Desktop Components: Start Menu, Taskbar.
Week 11	• Creating a folder with a specific name and training on renaming, hiding, recovering, deleting, and viewing its path. Folders and Files, Icons.
Week 12	• Training the student in performing operations on windows, desktop wallpaper. Performing Operations on Windows, Desktop Wallpapers.
Week 13	• Training the student on using the Control Panel. Control Panel: Windows Control

	Panel, Categories.
Week 14	• Training the student on uninstalling and reinstalling a specific program. From Control Panel: Defragmenting Files Inside the Computer, Installing and Uninstalling Programs.
Week 15	• Training the student on common computer settings, installing the printer, managing time and date, and maintaining primary disks (Partitions C, D, E, F). Common Computer Settings: Printer Management, Time and Date Settings, Primary Disk Maintenance.
Week 16	• Preparatory week before the final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	R. E. Bryant and D. R. O'Hallaron, "Computer Systems: A Programmer's Perspective," 2019.	Yes
Recommended Texts	G. Brookshear and D. Brylow, "Computer Science: An Overview," 2020.	No
Websites	The Collage E-Library	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Human Rights and Democracy**			**Module Delivery**	
Module Type	**Support or related learning activity**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**MTU1006**				
ECTS Credits	**2**				
SWL (hr/sem)	**50**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	ENG - EET		**College**	EETC	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Professor		**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	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The module aims to: 1. To provide students with a comprehensive understanding of the historical development of human rights and their significance in contemporary society. 2. To familiarize students with the concept and characteristics of human rights, enabling them to analyze and evaluate various human rights issues and challenges. 3. To explore the different generations of human rights, their evolution over time, and the implications for individuals and communities. 4. To examine the role of human rights in ancient civilizations and Abrahamic religions, highlighting the contributions and influences of these historical contexts. 5. To investigate the international and regional recognition of human rights through the study of key charters, conventions, and declarations, enabling students to comprehend the global framework for human rights protection and promotion.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate a comprehensive understanding of the fundamental concepts and techniques of differential calculus, including limits, derivatives, and their applications in engineering contexts. 2. Apply differentiation techniques proficiently to solve a wide range of engineering problems, such as optimization, motion analysis, and cost and revenue optimization. 3. Utilize transcendental functions effectively in engineering applications, demonstrating competence in working with exponential, logarithmic, and inverse trigonometric functions. 4. Apply the principles of differential equations to model and analyze engineering systems, including growth and decay phenomena and electrical circuits. 5. Employ critical thinking and analytical skills to tackle real-world engineering scenarios, utilizing differential calculus concepts to develop innovative solutions.
Indicative Contents المحتويات الإرشادية	1. Historical Evolution of Human Rights: This content will focus on tracing the historical development of human rights, from ancient civilizations to the modern era. It will explore significant milestones and events that shaped the concept of human rights over time. [11 hrs.] 2. Conceptual Foundations of Human Rights: This section will delve into the theoretical underpinnings and key concepts of human rights. It will cover topics such as universality, indivisibility, and the inherent dignity of every individual as the basis for human rights. [11 hrs.] 3. Generations of Human Rights: This content will examine the different generations or categories of human rights, including civil and political rights, economic, social, and cultural rights, and solidarity rights. Students will explore the interdependence and interrelatedness of these rights. [11 hrs.] 4. Human Rights in Practice: This section will analyze real-world examples and case studies to illustrate the application of human rights principles. It may include topics such as human rights violations, human rights advocacy, and the role of international and regional human rights mechanisms. [11 hrs.] 5. Emerging Issues in Human Rights: This content will explore contemporary challenges and emerging issues in the field of human rights. It may cover topics such as technology and human rights,

	environmental rights, rights of vulnerable groups, and the intersectionality of human rights with other fields such as gender, race, and socio-economic factors. [11 hrs.]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module will employ various learning and teaching strategies to enhance students' understanding and engagement. These strategies will include: 1. Lectures: Traditional lectures will be delivered by the instructor to provide foundational knowledge and concepts related to human rights. Lectures will offer comprehensive explanations, historical context, and theoretical frameworks. 2. Discussions and Debates: Interactive discussions and debates will be conducted to encourage critical thinking and active participation. Students will have the opportunity to express their opinions, engage in thoughtful debates, and analyze different perspectives on human rights issues. 3. Case Studies: Real-life case studies will be examined to illustrate the application of human rights principles in different contexts. Students will analyze and discuss these cases to develop problem-solving skills and gain a deeper understanding of the practical implications of human rights. 4. Group Projects: Collaborative group projects will be assigned to promote teamwork and research skills. Students will work together on specific human rights topics, conduct research, and present their findings to the class. This approach fosters teamwork, communication, and research abilities. 5. Guest Speakers: Inviting guest speakers, such as human rights activists, legal experts, or representatives from relevant organizations, will provide students with firsthand insights into the practical aspects of human rights work. Guest speakers can share their experiences, expertise, and engage in interactive discussions with students. 6. Multimedia Resources: Utilizing multimedia resources such as videos, documentaries, and online platforms will enhance students' understanding and engagement with human rights topics. These resources can present real-life examples, testimonies, and visual representations to complement the theoretical aspects of the module. 7. Critical Analysis and Reflection: Assignments and assessments will encourage students to critically analyze human rights issues, reflect on their personal perspectives, and evaluate the impact of human rights violations and advancements. This will develop their analytical skills and foster a deeper understanding of the complex nature of human rights. 8. Independent Study: Students will be encouraged to engage in independent study, including reading relevant textbooks, scholarly articles, and reports. This will enable them to deepen their understanding of specific human rights topics, broaden their knowledge base, and develop self-directed learning skills. 9. Overall, these learning and teaching strategies aim to create an interactive and engaging learning environment, fostering critical thinking, active participation, and a deeper understanding of human rights principles and their practical application.

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, 8 and 9
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.				
	Report	1	10% (10)	14	LO # 1-14
Summative assessment	Midterm Exam	2 hours	20% (10)	7	LO # 1-7
	Final Exam	3 hours	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1:	Introduction to Human Rights (1 week). • Historical Development of Human Rights. • Concept and Characteristics of Human Rights. Importance and Relevance of Human Rights.
Week 2:	Human Rights in Ancient Civilizations (1 week). • Examination of Human Rights in Ancient Societies. • Contributions of Ancient Civilizations to Human Rights Principles.
Week 3:	Human Rights in Abrahamic Religions (1 week). • Exploration of Human Rights in Judaism, Christianity, and Islam. • Emphasis on the Personality of Prophet Muhammad (PBUH) and his Contribution to Human Rights.
Week 4:	Human Rights in the Medieval and Modern Ages (1 week). • Evolution of Human Rights during the Middle Ages and Modern Era. • Impact of Enlightenment and Renaissance on Human Rights.
Week 5:	Contemporary International Recognition of Human Rights (1 week). • Analysis of International Human Rights Instruments and Treaties. • Focus on the Universal Declaration of Human Rights (1948).
Week 6:	Regional Recognition of Human Rights (1 week). • Examination of Regional Human Rights Systems and Mechanisms. • Exploration of Non-Governmental Organizations' Role in Promoting Human Rights.

Week 7:	Human Rights in International Charters (1 week). • Study of Key International Charters and Conventions. • In-depth Analysis of the Universal Declaration of Human Rights (1948).
Week 8:	Human Rights in National Constitutions (Iraqi Constitutions) (1 week). • Examination of Human Rights Provisions in Iraqi Constitutions. • Comparative Analysis of Constitutional Safeguards for Human Rights.
Week 9:	Human Rights in Iraq after 2003 (Iraqi Constitution 2005) (1 week). • Overview of Human Rights Developments in Iraq post-2003. • Analysis of the Iraqi Constitution of 2005 and its Impact on Human Rights.
Week 10:	Safeguards of Human Rights at Various Levels (1 week). • Exploration of International, Regional, and National Mechanisms for Protecting Human Rights. • Focus on Genocide as a Violation of Human Rights.
Week 11:	Financial and Administrative Corruption (1 week). • Understanding the Phenomenon of Financial and Administrative Corruption. • Causes and Consequences of Corruption and Efforts to Combat it.
Week 12:	Week 12: Right to Water and Sustainable Management (1 week). • Importance of the Right to Water as a Human Right. • Strategies for Sustainable Water Management and Ensuring Access to Clean Water.
Week 13:	Week 13: Terrorism and its Impact on State and Society (1 week). • Examination of Terrorism and its Threat to Human Rights. • Analysis of Counter-Terrorism Measures and Balancing Human Rights Considerations.
Week 14:	Human Rights in Contemporary Issues (1 week). • Exploration of Current Human Rights Challenges and Debates. • Discussion on Emerging Human Rights Issues in the Modern World.
Week 15:	Review and Conclusion (1 week). • Recap of Key Concepts and Themes Covered in the Module. Discussion on the Importance of Upholding and Promoting Human Rights in Today's Society.
Week 16	Preparatory week before the final Exam.

الكلية التقنية الهندسية الكهربائية
Electrical Engineering Technical College

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. "حقوق الإنسان في العالم العربي: القضايا والتحديات"، تأليف: علي حجازي وجمال شعت. الطبعة: الطبعة الثانية، العام: 2017. 2. "مبادئ حقوق الإنسان: المفاهيم والقضايا الحديثة"، تأليف: أحمد المجالي وغسان حمدان. الطبعة: الطبعة الأولى، العام: 2019.	Yes
Recommended Texts	1. "حقوق الإنسان والديمقراطية"، تأليف: مصطفى كامل محمود. الطبعة: الطبعة الأولى، العام: 2015. 2. "تاريخ حقوق الإنسان في العصور القديمة والوسطى"، تأليف: نبيل رزق. الطبعة: الطبعة الثالثة، العام: 2012. 3. "حقوق الإنسان في العراق: الواقع والتحديات"، تأليف: سعد الله عباس. الطبعة: الطبعة الأولى، العام: 2014. 4. "حقوق الإنسان في العراق: المفهوم والتطور"، تأليف: عبد الكريم السامرائي. الطبعة: الطبعة الأولى، العام: 2018. 5. "حقوق الإنسان في العراق: بين التحديات والآفاق"، تأليف: محمد السامرائي ولقاء الحربي. الطبعة: الطبعة الأولى، العام: 2020.	No
Websites	The Collage E-Library	

Grading Scheme
مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Integral Mathematics**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☒ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**EET1205**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	ENG – EET		**College**	EETC	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst. 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 Aims أهداف المادة الدراسية	The module aims to: 1. To provide students with a comprehensive understanding of integration principles and techniques, including both indefinite and definite integration. 2. To equip students with the necessary skills to integrate various types of functions, such as trigonometric, inverse trigonometric, logarithmic, exponential, and hyperbolic functions. 3. To enable students to apply integration methods to solve practical problems and real-world applications, including finding areas, lengths of curves, surface areas, and volumes of solids. 4. To foster critical thinking and analytical skills by challenging students with a variety of integration problems and encouraging them to develop efficient problem-solving strategies. 5. To prepare students for advanced mathematical studies and future disciplines that require a strong foundation in integration, such as physics, engineering, economics, and computer science.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of the Integral Mathematics module, students should be able to demonstrate the following five learning outcomes: 1. Apply integration techniques: Students will be able to apply various integration techniques, such as substitution, integration by parts, and trigonometric substitution, to solve mathematical problems involving integration. 2. Integrate different types of functions: Students will be able to integrate a wide range of functions, including trigonometric, inverse trigonometric, logarithmic, exponential, and hyperbolic functions, using appropriate integration methods. 3. Solve practical problems using definite integration: Students will be able to apply definite integration to solve real-world problems, such as finding areas between curves, calculating lengths of curves, determining surface areas, and evaluating volumes of solids. 4. Analyze and interpret mathematical results: Students will be able to analyze and interpret the results obtained from integration, including understanding the physical significance of mathematical solutions and applying them in relevant contexts, such as physics, engineering, and other scientific disciplines. 5. Demonstrate critical thinking and problem-solving skills: Students will be able to think critically, approach integration problems systematically, and develop effective problem-solving strategies, demonstrating their ability to tackle complex mathematical challenges.
Indicative Contents المحتويات الإرشادية	The module may cover the following five indicative contents: 1. Indefinite Integration: [14 hrs.] • Definitions and basic properties of indefinite integration. • Integration of trigonometric functions. • Integration of inverse trigonometric functions. • Integration of logarithmic and exponential functions. • Integration of hyperbolic functions. 2. Techniques of Integration: [14 hrs.] • Substitution method for integration. • Integration by parts. • Integration using trigonometric identities. • Integration involves partial fractions.

	• Integration of functions with power, exponential, or logarithmic factors. 3. Definite Integration and Applications: [14 hrs.] • Definite integration and its interpretation as area under a curve. • Applications of definite integration, such as finding areas between curves, lengths of curves, and volumes of solids. • Calculation of moments and centroids using definite integration. • Evaluation of improper integrals. 4. Numerical Integration: [14 hrs.] • Introduction to numerical methods for approximating definite integrals, including the trapezoidal rule and Simpson's rule. • Error analysis and estimation in numerical integration. • Application of numerical integration methods in practical scenarios. 5. Advanced Integration Techniques: [14 hrs.] • Integration of trigonometric functions using trigonometric substitution. • Integration of rational functions using partial fraction decomposition. • Integration of more complex functions, including those involving radicals or trigonometric and logarithmic combinations.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The module will employ the following learning and teaching strategies: 1. Lectures and Demonstrations: In-class lectures and demonstrations provide a structured approach to presenting the theoretical concepts of integration. The instructor can explain key concepts, demonstrate integration techniques, and provide examples to illustrate their application. 2. Problem-Solving Sessions: Regular problem-solving sessions allow students to actively engage with integration problems. These sessions can involve individual or group work, where students can practice applying integration techniques to solve a variety of problems and receive immediate feedback from the instructor. 3. Interactive Discussions: Engaging students in interactive discussions fosters critical thinking and deeper understanding of integration concepts. The instructor can facilitate discussions on integration strategies, real-world applications, and the connection between integration and other mathematical topics. 4. Practical Application Exercises: Assigning practical application exercises specific to electrical engineering helps students see the relevance of integration in their field of study. These exercises may involve solving engineering problems related to circuit analysis, signal processing, or electromagnetic theory using integration techniques. 5. Technology-Assisted Learning: Utilizing technology tools, such as computer software or online resources, can enhance learning and visualization of integration concepts. Students can use mathematical software to perform numerical integrations, graph functions, and explore the graphical interpretations of integration results.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1:	• Indefinite Integration: Basic principles of integration, indefinite integrals, and integration rules for trigonometric functions.
Week 2:	• Integration of Inverse Trigonometric Functions: Techniques for integrating inverse trigonometric functions.
Week 3:	• Integration of Logarithmic and Exponential Functions: Methods for integrating logarithmic and exponential functions.
Week 4:	• Integration of Hyperbolic Functions • Techniques for integrating hyperbolic functions.
Week 5:	• Integration Methods • Further integration methods, including integration by substitution and integration by parts.
Week 6:	• Definite Integration • Introduction to definite integration, evaluating definite integrals, and applications in finding areas between curves.
Week 7:	• Applications of Definite Integration • Calculating the length of curves and determining surface areas using definite integration.
Week 8:	• Volumes of Solids • Using integration to find volumes of solids, including solids of revolution and cross-sectional areas.

Week 9:	• Applications in Physics • Applying definite integration to solve physics problems involving motion, work, and fluid forces.
Week 10:	• Techniques of Integration Review • Reviewing and practicing integration techniques, including substitution, integration by parts, and trigonometric substitution.
Week 11:	• Area Between Curves • Exploring methods for finding the area between two curves and applying them to practical problems.
Week 12:	• Length of Curves • Calculating the length of curves using integration techniques.
Week 13:	• Surface Area • Determining the surface area of three-dimensional objects using integration methods.
Week 14:	• Review and Exam Preparation • Comprehensive review of the topics covered throughout the module and preparation for final exams.
Week 15:	• Assessment covering the concepts and applications of integral mathematics.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Calculus: Early Transcendentals" by James Stewart (8th Edition, Cengage Learning, 2015).	Yes
Recommended Texts	"Advanced Engineering Mathematics" by Erwin Kreyszig (10th Edition, Wiley, 2011).	No
Websites	The Collage E-Library	

Grading Scheme
مخطط الدرجات

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

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