Al-Furat Al-Awsat Technical University

جامعة الفرات الاوسط التقنية
الكلية التقنية المسيب
قسم تقنيات الهندسة الكهربائية

First Cycle – Bachelor's Degree (B.Sc.) - Electrical Engineering Techniques

بكالوريوس ـ تقنيات الهندسة كهربائية

MODULE DESCRIPTION

تقنيات الهندسة الكهربائية

Module Information معلومات المادة الدراسية					
Module Title	**DC Electrical Circuits**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**ATU23031**				
ECTS Credits	**6**				
SWL (hr/sem)	150				
Module Level	1		**Semester of Delivery**	1	
Administering Department	3		**College**	2	
Module Leader	Ammer auid Abdullah		**e-mail**	Ammar.o.abdallh@atu.edu.iq	
Module Leader's Acad. Title	Asst.lecturer		**Module Leader's Qualification**	MSC	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	AC Electrical Circuits	**Semester**	2
Co-requisites module	None	**Semester**	--

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchhoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</u> 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. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] . 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. [15 hrs] Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u>

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

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	150	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	78
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	63
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**180**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Difference between Circuit Theory and Field Theory
Week 2	Basics of Network Elements
Week 3	Resistance and Resistivity, Ohm's Law and Inductance, Capacitance
Week 4	Review of Kirchhoff's Laws, Circuit Analysis - Nodal and Mesh
Week 5	Linearity and Superposition, Source Transformations, Thévenin and Norton Equivalents
Week 6	Review of Inductor and Capacitor as Circuit Elements, Source-free RL and RC Circuits, Transient Response
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Sinusoidal Forcing, Complex Forcing, Phasors, and Complex Impedance, Sinusoidal Steady State Response
Week 9	Nodal and Mesh Revisited, Average Power, RMS, Introduction to Polyphase Circuits
Week 10	Mutual Inductance, Linear and Ideal Transformers, Circuits with Mutual Inductance
Week 11	Frequency Response of Series/Parallel Resonances, High-Q Circuits
Week 12	Complex Frequency, s-Plane, Poles and Zeros, Response Function, Bode Plots
Week 13	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 14	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 15	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Agilent VEE and PSPICE
Week 2	Lab 2: Thévenin's / Norton's Theorem and Kirchhoff's Laws
Week 3	Lab 3: First-Order Transient Responses
Week 4	Lab 4: Second-Order Transient Responses
Week 5	Lab 5: Frequency Response of RC Circuits
Week 6	Lab 6: Frequency Response of RLC Circuits
Week 7	Lab 7: Filters

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	**English for Academic**			**Module Delivery**	
Module Type	**S**			☒**Theory** ☐**Lecture** ☐ **lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	ATU23016				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level		1	**Semester of Delivery**		1
Administering Department		EEE	**College**	TCM	
Module Leader	Ahmed Hussein duhis		**e-mail**	Com.ahmed4@atu.edu.iq	
Module Leader's Acad. Title		Lecher	**Module Leader's Qualification**		Msc
Module Tutor			**e-mail**		
Peer Reviewer Name		Name	**e-mail**		
Scientific Committee Approval Date		01/06/2023	**Version Number**		1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Teaching the student, the basic principle of English Language. 2. Teaching students the exits of letters. 3. Teach the student the basic rules of the subject .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Listening, Question, Cities and Countries, Numbers, Reading, Every Day English . 2. The Family, Possessives, Possessives Adjectives Vocabulary, Listening, Reading, Everyday English. 3. Sport, Food and Drinks, Present Simples, Number and Price, Listening. 4. Questions, Pronouns and Possessives. 5. Prepositions, Everyday English, Past Simple Irregular Verbs,. 6. Times Past, Reading, Past Simple- Regular, Everyday English, Vocabulary, Grammar,. 7. Present Continuous, Present Simple and Continuous, Reading, Opposite Verbs.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Introduction , Listening, Question, Cities and Countries, Numbers, Reading, Every Day English, Jobs, Question and Negatives, Address, Phone Remember, Listening, Pronunciation, Listening, Everyday English, Sport, Food and Drinks, Present Simples, Number and Price, Listening, Object Pronouns, Questions Words, Why and Because, Vocabulary, Reading, Writing, Everyday English. Part B -

	, Prepositions, Everyday English, Past Simple Irregular Verbs, Times Past, Reading, Past Simple- Regular, Everyday English, Vocabulary, Grammar, Past Simple, Making Conversation, Time Expression, Reading, Everyday English, Present Continuous, Present Simple and Continuous, Reading, Opposite Verbs.

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	27	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	**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	20% (20)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	-	-	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction
Week 2	Basics of Present simple tense
Week 3	Spelling of –S and –ES and Exercises.
Week 4	**Present continuous tense** and Exercises.
Week 5	**Spelling of –ing and Spelling of –ed.**
Week 6	**Past simple tense and Exercises.**
Week 7	Mid-term Exam
Week 8	**Past continuous tense and Exercises.**
Week 9	EXPRESSIONS OF QUANTITY.
Week 10	Present perfect tense
Week 11	COMPARE THE PAST SIMPLE AND PRESENT PERFECT
Week 12	Verb Patterns
Week 13	The Second Conditional

Week 14	Past Perfect Tense
Week 15	Present Perfect Continuous
Week 16	**Preparatory week before the final Exam**

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

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

Grading Scheme مخطط الدرجات

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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	**Human Rights and Democracy**	**Module Delivery**
Module Type	**Asst.**	☒**Theory** ☒**Lecture** **Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**
Module Code	**ATU23022**	
ECTS Credits	**6**	
SWL (hr/sem)	150	

Module Level	1	**Semester of Delivery**	1
Administering Department	3	**College**	2
Module Leader	Jinan jassaim abbas	**e-mail**	Jinan jassaim @atu.edu.iq
Module Leader's Acad. Title	Asst.lecturer	**Module Leader's Qualification**	MSC
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	--	**Semester**	--
Co-requisites module	None	**Semester**	--

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	7. حقوق الإنسان، تعريفها، أهدافها
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	حقوق الإنسان الحديثة: الحقائق في التنمية، الحق في البيئة النظيفة، الحق في التضامن، الحق في الدين ضمانات احترام وحماية حقوق الإنسان على الصعيد الوطني، الضمانات في الدستور والقوانين، الضمانات في مبدأ سيادة القانون، الضمانات في الرقابة الدستورية، الضمانات في حرية الصحافة والرأي العام، دور المنظمات غير الحكومية في احترام وحماية حقوق الإنسان..
Indicative Contents	ضمانات واحترام وحماية حقوق الإنسان على الصعيد الدولي:

المحتويات الإرشادية	• دور الأمم المتحدة ووكالاتها المتخصصة في توفير الضمانات. • دور المنظمات الإقليمية (الجامعة العربية، الاتحاد الأوربي، الاتحاد الأفريقي، منظمة الدول الأمريكية، منظمة آسيان). دور المنظمات الدولية الإقليمية غير الحكومية والرأي العام في احترام وحماية حقوق الإنسان.

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	150	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	78
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	72
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	حقوق الإنسان، تعريفها، أهدافها
Week 2	جذور حقوق الإنسان وتطورها في التاريخ البشري: حقوق الإنسان في العصور القديمة والوسيطة.
Week 3	حقوق الإنسان في العصور الوسطى: حقوق الإنسان في المذاهب والمدارس والنظريات السياسي، حقوق الإنسان في الشركات وإعلاناتها والثورات والدساتير (الوثائق الإنكليزية
Week 4	المنظمات غير الحكومية و حقوق الإنسان (اللجنة الدولية للصليب الاحمر، منظمة العفو الدولية، منظمة مراقبة حقوق الإنسان).
Week 5	حقوق الإنسان الاقتصادية والاجتماعية والثقافية و حقوق الإنسان المدنية والسياسية
Week 6	ضمانات احترام وحماية حقوق الإنسان على الصعيد الوطني، الضمانات في الدستور والقوانين، الضمانات في مبدأ سيادة القانون، الضمانات في الرقابة الدستورية، الضمانات في حرية الصحافة والرأي العام، دور المنظمات غير الحكومية في احترام وحماية حقوق الإنسان.
Week 7	ضمانات واحترام وحماية حقوق الإنسان على الصعيد الدولي: + Mid-term Exam • دور الأمم المتحدة ووكالاتها المتخصصة في توفير الضمانات. • دور المنظمات الإقليمية (الجامعة العربية، الاتحاد الأوربي، الاتحاد الأفريقي، منظمة الدول الأمريكية، منظمة آسيان). دور المنظمات الدولية الإقليمية غير الحكومية والرأي العام في احترام وحماية حقوق الإنسان.
Week 8	القاعدة الشرعية لدول القانون.
Week 9	تنظيم الحريات العامة من قبل السلطات العامة.
Week 10	التقاضي او التنظيم غير القضائي
Week 11	المساواة: التطور التاريخي لمفهوم المساواة
Week 12	المساواة بين الجنسين
Week 13	المساواة بين الأفراد حسب معتقداتهم وعنصرهم
Week 14	• اثر ازدواجية القضاء على الحريات العامة. الحريات العامة بمقتضى الفقه الإداري
Week 15	تنظيم الحريات العامة من قبل السلطات العامة.

Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	----	Yes
Recommended Texts	---	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to

condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Engineering Workshops			**Module Delivery**	
Module Type	**Assistance**			**Theory** **☒Lecture** **☒Lab** **☐Tutorial** **☐ Practical** **☐Seminar**	
Module Code	**ATU23015**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	3		**College**	2	
Module Leader	Ahmed Mehdi		**e-mail**	Ahmed Mehdi @atu.edu.iq	
Module Leader's Acad. Title	Asst.lecturer		**Module Leader's Qualification**	MSC	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	AC Electrical Circuits & DC Electrical Circuits	**Semester**	2
Co-requisites module	None	**Semester**	--

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	8. To develop problem solving skills and understanding of circuit theory through the application of techniques. 9. تعليم المهارات العملية للطالب وبكل المجالات الهندسية
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	2. تعليم المهارات العملية للطالب وبكل المجالات الهندسية
Indicative Contents المحتويات الإرشادية	كيفية استخدام أجهزة القياس المختلفة في الورشة مثل (افوميتر – راسم الذبذبات – مجهز القدرة ...)

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	125	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	63
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	62
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**180**		

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered and practical
Week 1	كيفية استخدام أجهزة القياس المختلفة في الورشة مثل (افوميتر – راسم الذبذبات – مجهز القدرة ...)
Week 2	كيفية استخدام الكاويات – أنواع الكاويات المستخدمة في الورشة – التدريب على اللحام بالكاوية
Week 3	الدوائر الالكترونية المطبوعة المختلفة – التعرف على كيفية تثقيبها وتثبيت المكونات الالكترونية المختلفة عليها .
Week 4	الأنواع المختلفة للمقاومات من حيث المادة المصنعة منها المقاومات – القدرة التي تتحملها كل مقاومة ، كيفية قراءة قيم المقاومات بالطرق المختلفة – المقاومات المتغيرة – والخاصة (VCR-PYC-NTC. كيفية فحصها)
Week 5	عمل دائرة لربط المقاومات على التوالي – عمل دائرة لربط المقاومات على التوازي - عمل دائرة لربط المقاومات على التوالي والتوازي – فحص الدائرة
Week 6	عمل دوائر لربط المتسعات على التوازي والتوالي والمختلط على اللوح المطبوع مع الفحص
Week 7	أنواع المصهرات المستخدمة في الدوائر الالكترونية. أنواع وأقطار الأسلاك المستعملة في المصهرات – Mid-term Exam + التيار الذي يتحمله كل نوع – كيفية إصلاح المصهرات
Week 8	التأسيسات الكهربائية ، أنواعها (الظاهري) – الدفن داخل الأنابيب – تأسيس سيمنس – رسم دائرة تأسيس مصابيح مع دائرة السيطرة – تمرين عملي على تأسيس الدائرة
Week 9	رسم دائرة تأسيس مصباح (مصباح سلم) طريقين باستعمال مفتاح طريقين – تطبيق عملي للدائرة.
Week 10	تشغيل محرك ذو الوجه الواحد بواسطة لاقط هوائي مع زر ضغط
Week 11	ورشة الخراطة : مختلف أدوات القياس وكيفية استخدامها
Week 12	ورشة البرادة : الأنواع المختلفة من المبارد والمناشير وأدوات القياس المختلفة واستخدامها .
Week 13	اللحام الكهربائي – التعرف على الأجهزة والمعدات المستخدمة
Week 14	لحام النقطة ، التعرف على الأجهزة المستخدمة وتنفيذ تمرين بسيط
Week 15	التدريب على استخدام أجهزة اللحام الكهربائي في تدريب بسيط.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر	
	Material Covered

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of laboratory in Ac circuits.	Yes
Recommended Texts		No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Arabic Language			**Module Delivery**	
Module Type	**Asst.**			☒**Theory** ☒**Lecture** **Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**ATU23023**				
ECTS Credits	**5**				
SWL (hr/sem)	125				
Module Level	1		**Semester of Delivery**	1	
Administering Department	3		**College**	2	
Module Leader			**e-mail**		
Module Leader's Acad. Title	Asst.lecturer		**Module Leader's Qualification**	MSC	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	10. تعريف الطلبة أهمية القواعد العربية 11. النطق الصحيح للجمل والكلمات.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	ضبط قواعد اللغة العربية وكذلك اصدار أوامر والكتب الرسمية
Indicative Contents المحتويات الإرشادية	تمكين الطالب من اللفظ الصحيح والحراج الجمل الصحيحة باللغة العربية.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	استراتيجيات التعلم والتعليم بواسطة الكيتسو

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	125	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	77

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	48
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**125**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	اقسام الكلام
Week 2	الجملة الاسمية
Week 3	الجملة الفعلية
Week 4	المبتدأ والخبر

Week 5	الفاعل
Week 6	الفعل
Week 7	Mid-term Exam + المفعول بة
Week 8	المفعول معة
Week 9	اخوات كان
Week 10	اخوات ان
Week 11	حروف الجر
Week 12	أدوات النصب
Week 13	أدوات الجزم
Week 14	الشعر الجاهلي
Week 15	الشعر الحديث
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Arabic Language	**Module Delivery**
Module Type	**Asst.**	☒ **Theory** ☒ **Lecture** **Lab** ☐ **Tutorial**
Module Code	**ATU23023**	
ECTS Credits	**5**	

SWL (hr/sem)	125	☐ **Practical** ☐ **Seminar**	
Module Level	1	**Semester of Delivery**	1
Administering Department	3	**College**	2
Module Leader		**e-mail**	
Module Leader's Acad. Title	Asst.lecturer	**Module Leader's Qualification**	MSC
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	---	**Semester**	--
Co-requisites module	None	**Semester**	--

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. تعريف الطلبة أهمية القواعد العربية 2. النطق الصحيح للجمل والكلمات.
Module Learning Outcomes	ضبط قواعد اللغة العربية وكذلك اصدار أوامر والكتب الرسمية

مخرجات التعلم للمادة الدراسية	
Indicative Contents المحتويات الإرشادية	تمكين الطالب من اللفظ الصحيح والحراج الجمل الصحيحة باللغة العربية.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	استراتيجيات التعلم والتعليم بواسطة الكيتسو

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	125	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	77
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	48
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**
	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	اقسام الكلام
Week 2	الجملة الاسمية
Week 3	الجملة الفعلية
Week 4	المبتدأ والخبر
Week 5	الفاعل
Week 6	الفعل
Week 7	Mid-term Exam + المفعول بة
Week 8	المفعول معة
Week 9	اخوات كان
Week 10	اخوات ان
Week 11	حروف الجر
Week 12	أدوات النصب
Week 13	أدوات الجزم

Week 14	الشعر الجاهلي
Week 15	الشعر الحديث
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts		Yes
Recommended Texts		No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (50 - 100)	**A -** Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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	F – Fail	راسب	(0-44)	Considerable amount of work required

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electrical Circuit Analysis			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**ATU23024**			☒ **Lecture**	
ECTS Credits	5			☒ **Lab**	
SWL (hr/sem)	125			☐ **Tutorial** ☐ **** Practical** ☐ **Seminar**	
Module Level	1		**Semester of Delivery**	1	
Administering Department	3		**College**	2	
Module Leader	Ammar ouaed Abdallah		**e-mail**	Ammar.o.abdallh @atu.edu.iq	
Module Leader's Acad. Title	Asst.lecturer		**Module Leader's Qualification**	MSC	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	AC Electrical Circuits	**Semester**	2
Co-requisites module	None	**Semester**	--

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	3. To develop problem solving skills and understanding of circuit theory through the application of techniques. 4. To understand voltage, current and power from a given circuit. 5. This course deals with the basic concept of electrical circuits. 6. This is the basic subject for all electrical and electronic circuits. 7. To understand Kirchhoff's current and voltage Laws problems. 8. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 12. Recognize how electricity works in electrical circuits. 13. List the various terms associated with electrical circuits. 14. Summarize what is meant by a basic electric circuit. 15. Discuss the reaction and involvement of atoms in electric circuits. 16. Describe electrical power, charge, and current. 17. Define Ohm's law. 18. Identify the basic circuit elements and their applications. 19. Discuss the operations of sinusoid and phasors in an electric circuit.

	20. Discuss the various properties of resistors, capacitors, and inductors. 21. Explain the two Kirchoff's laws used in circuit analysis. 22. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</u> 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. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs] 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. [15 hrs] Revision problem classes [6 hrs] <u>Part B - Analogue Electronics</u> Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs]

	Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs]

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

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

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Difference between Circuit Theory and Field Theory
Week 2	Basics of Network Elements
Week 3	Resistance and Resistivity, Ohm's Law and Inductance, Capacitance
Week 4	Review of Kirchhoff's Laws, Circuit Analysis - Nodal and Mesh
Week 5	Linearity and Superposition, Source Transformations, Thévenin and Norton Equivalents
Week 6	Review of Inductor and Capacitor as Circuit Elements, Source-free RL and RC Circuits, Transient Response
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Sinusoidal Forcing, Complex Forcing, Phasors, and Complex Impedance, Sinusoidal Steady State Response

Week 9	Nodal and Mesh Revisited, Average Power, RMS, Introduction to Polyphase Circuits
Week 10	Mutual Inductance, Linear and Ideal Transformers, Circuits with Mutual Inductance
Week 11	Frequency Response of Series/Parallel Resonances, High-Q Circuits
Week 12	Complex Frequency, s-Plane, Poles and Zeros, Response Function, Bode Plots
Week 13	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 14	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 15	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Thévenin and Norton Equivalents
Week 2	Lab 2: Thévenin's / Norton's Theorem and Kirchhoff's Laws with different values
Week 3	Lab 3: the RLC Circuit in parallel and series
Week 4	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 5	Lab 5: Frequency Response of RC Circuits
Week 6	Lab 6: Nodal and Mesh Revisited, Average Power, RMS
Week 7	Lab 7: different types of Filters

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 2022	Yes

Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2023, 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**	

Module Code	**ATU23012**	☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ ****Practical** ☐ **Seminar**
ECTS Credits	**6**	
SWL (hr/sem)	150	

Module Level	1	**Semester of Delivery**	1
Administering Department	3	**College**	2
Module Leader	Sara Abdul star	**e-mail**	sarasatar70@yahoo.com
Module Leader's Acad. Title	Asst.lecturer	**Module Leader's Qualification**	MSC
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Electronic Essentials	**Semester**	3
Co-requisites module	None	**Semester**	--

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	9. To develop problem solving skills and understanding of circuit theory through the application of techniques.

	10. To understand logical circuits (0&1). 11. This course deals with the basic concept of electrical circuits. 12. This is the basic subject for all electrical and electronic circuits with programs using computer. 13. To perform and analysis with different cases of logical cct .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 23. Recognize how electricity works in electrical circuits. 24. List the various terms associated with electrical circuits. 25. Summarize what is meant by a basic electric circuit. 26. Discuss the reaction and involvement of atoms in electric circuits. 27. Identify the basic circuit elements and their applications with logical part. 28. Discuss the operations of (0&1) levels.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part - Analogue Electronics</u> Fundamentals: - 1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand logical circuits (0&1). 3. This course deals with the basic concept of electrical circuits. [15 hrs] Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs] Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs]

Learning and Teaching Strategies

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	150	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	78
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	72
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
	Midterm Exam	2hr	10% (10)	7	LO #1 - #7

Summative assessment	**Final Exam**	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	**Number system: General number formula: Binary, octal, decimal and hexadecimal numbers.1**
Week 2	**Number system: General number formula: Binary, octal, decimal and hexadecimal numbers.**2
Week 3	**Numbers Base Conversion: Arithmetic operations in different number system, complements, binary codes.**
Week 4	**Numbers Base Conversion: Arithmetic operations in different number system, complements, binary codes, BCD.**
Week 5	**Numbers Base Conversion: Arithmetic operations in different number system, complements, binary codes, BCD, Ex-3, Gray codes**
Week 6	**Boolean Algebra: Basic definitions, basic theorem and properties, Boolean functions.1**
Week 7	**Mid-term Exam + Boolean Algebra: Basic definitions, basic theorem and properties, Boolean functions.**2
Week 8	**Boolean Algebra: Basic definitions, basic theorem and properties, Boolean functions.**3
Week 9	**Canonical and Standard forms Digital Logic Gates:1**
Week 10	**Canonical and Standard forms Digital Logic Gates:2**
Week 11	**Karanough Maps: AND- OR implementation, don't care conditions.**
Week 12	**Karanough Maps: AND- OR implementation, don't care conditions.**
Week 13	**Karanough Maps: AND- OR implementation, don't care conditions.**
Week 14	**Adders Arithmetic Operations: Subtractions, half and full adders and subtractions, binary parallel address**

Week 15	**Sequential Logic: Flip-flops (RS, T, D, JK …), master slave FF, counters, shift register**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to **General number formula: Binary, octal, decimal and hexadecimal numbers**
Week 2	Lab 2: binary Laws
Week 3	Lab 3: **Arithmetic operations in different number system, complements, binary codes.**
Week 4	Lab 4: **Boolean Algebra**
Week 5	Lab 5: **Canonical and Standard forms Digital Logic Gates**
Week 6	Lab 6: **Karanough Maps: AND- OR implementation**
Week 7	Lab 7: **Sequential Logic: Flip-flops (RS, T, D, JK …), master slave FF, counters, shift register**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of logical cct, lander static McGraw-Hill Education,2002	Yes
Recommended Texts	Logical circuits : A Practical Approach Copyright Year: 2023	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	Differential Mathematics	**Module Delivery**
Module Type	**Core**	☒ **Theory**
Module Code	**ATU23014**	☒ **Lecture**
ECTS Credits	**5**	**Lab**
SWL (hr/sem)	125	☐** **Tutorial** ☐ **Practical** ☐ **Seminar**

Module Level		1	**Semester of Delivery**		1
Administering Department		3	**College**	2	
Module Leader	Yihia Hussein takheel		**e-mail**	Yihia.Hussein @atu.edu.iq	
Module Leader's Acad. Title		Asst.lecturer	**Module Leader's Qualification**		MSC
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date		01/06/2023	**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Integral Mathematics	**Semester**	2
Co-requisites module	None	**Semester**	--

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	14. To develop problem solving skills and understanding of circuit theory through the application of techniques. 15. To understand the methods of Mathematics moderns part.
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. Recognize how find the part s of Functions **Domain Range Equation of the straight line, Trigonometric functions and their sketches. Domain, Range, Inverse of functions, Absolute value, limits, Limits**

مخرجات التعلم للمادة الدراسية	**applications, Polar coordinates (general definition) Conic sections (general definition** electrical circuits. .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. To check the values of Mathematics with more applications. Part A - Theory part values [15 hrs]

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

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

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction
Week 2	**Functions Domain, Range** **Equation of the straight line, Trigonometric functions and their sketches. Domain, Range, Inverse of functions, Absolute value, limits, Limits applications, Polar coordinates (general definition) Conic sections (general definition)**
Week 3	**Functions Domain, Range** **Equation of the straight line, Trigonometric functions and their sketches. Domain, Range, Inverse of functions, Absolute value, limits, Limits applications, Polar coordinates (general definition) Conic sections (general definition)**
Week 4	**Differential calculus** **Methods of differentiation, Some applications of differentiation. Rates of change, Velocity and acceleration Differentiation of parametric equations, implicit functions,**

	Logarithmic, hyperbolic functions, inverse trigonometric, and hyperbolic functions. Partial differentiation, Total differential, rates of change and small changes Maxima, minima and saddle points for functions of two variables
Week 5	**Differential calculus** **Methods of differentiation, Some applications of differentiation. Rates of change, Velocity and acceleration Differentiation of parametric equations, implicit functions, Logarithmic, hyperbolic functions, inverse trigonometric, and hyperbolic functions. Partial differentiation, Total differential, rates of change and small changes Maxima, minima and saddle points for functions of two variables**
Week 6	**Differential calculus** **Methods of differentiation, Some applications of differentiation. Rates of change, Velocity and acceleration Differentiation of parametric equations, implicit functions, Logarithmic, hyperbolic functions, inverse trigonometric, and hyperbolic functions. Partial differentiation, Total differential, rates of change and small changes Maxima, minima and saddle points for functions of two variables**
Week 7	Mid-term Exam + **Differential calculus** **Methods of differentiation, Some applications of differentiation. Rates of change, Velocity and acceleration Differentiation of parametric equations, implicit functions, Logarithmic, hyperbolic functions, inverse trigonometric, and hyperbolic functions. Partial differentiation, Total differential, rates of change and small changes Maxima, minima and saddle points for functions of two variables**
Week 8	**Differential calculus** **Methods of differentiation, Some applications of differentiation. Rates of change, Velocity and acceleration Differentiation of parametric equations, implicit functions, Logarithmic, hyperbolic functions, inverse trigonometric, and hyperbolic functions. Partial differentiation, Total differential, rates of change and small changes Maxima, minima and saddle points for functions of two variables**
Week 9	**Determinants and Matrices** **The theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations. Cramer's Rule. Eigen values and eigenvectors**

Week 10	**Determinants and Matrices** **The theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations. Cramer's Rule. Eigen values and eigenvectors**
Week 11	**Determinants and Matrices** **The theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations. Cramer's Rule. Eigen values and eigenvectors**
Week 12	**Determinants and Matrices** **The theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations. Cramer's Rule. Eigen values and eigenvectors**
Week 13	**Determinants and Matrices** **The theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations. Cramer's Rule. Eigen values and eigenvectors**
Week 14	**Determinants and Matrices** **The theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations. Cramer's Rule. Eigen values and eigenvectors**
Week 15	**Determinants and Matrices** **The theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations. Cramer's Rule. Eigen values and eigenvectors**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	----- (No)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of mathematics by morad ali afinday ,2015	Yes
Recommended Texts	Principles of calculus, 2020	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	**Engineering Mechanics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**ATU23021**			☒ **Lecture**	
ECTS Credits	6			☒ **Lab**	
SWL (hr/sem)	150			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	2		**Semester of Delivery**	2	
Administering Department	3		**College**	2	
Module Leader	Ahmed alsfar		**e-mail**	ahmeed alsfar@atu.edu.iq	
Module Leader's Acad. Title	Asst.lecturer		**Module Leader's Qualification**	MSC	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Engineering Drawing	**Semester**	1
Co-requisites module	None	**Semester**	--

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives	

أهداف المادة الدراسية	16. To develop problem solving skills and understanding of circuit theory through the application of techniques. 17. To understand static mechanical part. 18. This course deals with the basic concept of mechanical part circuits. 19. This is the basic subject for all electrical and electronic circuits relationships with mechanical part. 20. To perform and analysis of behaviour mechanical part.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 29. Recognize how electricity works in electrical circuits. 30. List the various terms associated with electrical circuits. 31. Summarize what is meant by a basic electric circuit. 32. Discuss the reaction and involvement of atoms in electric circuits. 33. Describe electrical power, charge, and current. 34. Define Ohm's law. 35. Identify the basic circuit elements and their applications. 36. Discuss the operations of sinusoid and phasors in an electric circuit. 37. Discuss the various properties of resistors, capacitors, and inductors. 38. Explain the two Kirchoff's laws used in circuit analysis. 39. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: - **Force components+ Moment of a force+ Equilibrium of planar forces+ Thermal stresses.** [15 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	150	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	78
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	78	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	72
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 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All

Total assessment	100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - **Static science – Definitions**
Week 2	**Force components.**
Week 3	**Composition & resolution of forces.**
Week 4	**Equilibrium of planar forces.**
Week 5	**Centroid & center of gravity (for area & bodies).**
Week 6	**Shearing forces and bending moment's diagrams**
Week 7	Mid-term Exam + **Torsion of bars.**
Week 8	**Thermal stresses.**
Week 9	**Rotating cylinder.**
Week 10	**Rotating cylinder.**
Week 11	**Direct stress & direct strain and their relation.**
Week 12	**Direct stress & direct strain and their relation.**
Week 13	**Shearing forces and bending moment's diagrams**
Week 14	**Free – body diagram.**
Week 15	**Free – body diagram.**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to **Force components.**
Week 2	Lab 2: **Equilibrium of planar forces**
Week 3	Lab 3: **Direct stress & direct strain and their relation.**
Week 4	Lab 4: **Direct stress & direct strain and their relation.**
Week 5	Lab 5: **Free – body diagram**
Week 6	Lab 6: **Free – body diagram**
Week 7	Lab 7: **Shearing forces and bending moment's**

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
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Fail Group	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Computer Applications			**Module Delivery**	
Module Type	**Core**			**Theory** **☒ Lecture** **☒ Lab** **☐ Tutorial** **☐** ** **Practical** **☐ Seminar**	
Module Code	**ATU23036**				
ECTS Credits	**3**				
SWL (hr/sem)	75				
Module Level	2		**Semester of Delivery**	2	
Administering Department	3		**College**	2	
Module Leader	Rawwaa adel addual nabi		**e-mail**	Com. Aa.rwaa@atu.edu.iq	
Module Leader's Acad. Title	lecturer		**Module Leader's Qualification**	PHD student.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	21. To develop problem solving skills and understanding of circuit theory through the application of techniques. To understand **Fundamentals of Computer Method of operation, simple diagram of the components and units of the computer. Phase's computers and the development of computers and the data and information, Fields use of computers, Computer components, Types of Computers, Computer software. Devices of input and output** 1. To perform and Nodal analysis with programs systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. Recognize how **Fundamentals of Computer** 40. **Method of operation, simple diagram of the components and units of the computer. Phase's computers and the development of computers and the data and information, Fields use of computers, Computer components, Types of Computers, Computer software. Devices of input and output.** 41. Identify the word and excel values.
Indicative Contents	reference, power supplies. Recognize and study applications to how Fundamentals of Computer :-

المحتويات الإرشادية	1. Method of operation, simple diagram of the components and units of the computer. Phase's computers and the development of computers and the data and information, Fields use of computers, Computer components, Types of Computers, Computer software. Devices of input and output. [15 hrs]

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

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	75	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	63
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	63	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	12
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**75**		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - **Definition of the computer, components.**
Week 2	**Fundamentals of Computer** **Method of operation, simple diagram of the components and units of the computer. Phase's computers and the development of computers and the data and information, Fields use of computers, Computer components, Types of Computers, Computer software. Devices of input and output.**
Week 3	**Fundamentals of Computer** **Method of operation, simple diagram of the components and units of the computer. Phase's computers and the development of computers and the data and information, Fields use of computers, Computer components, Types of Computers, Computer software. Devices of input and output.**
Week 4	**Fundamentals of Computer** **Method of operation, simple diagram of the components and units of the computer. Phase's computers and the development of computers and the data and information, Fields use of**

	computers, Computer components, Types of Computers, Computer software. Devices of input and output.
Week 5	**Window Operating System** **Desktop, Mouse, my computer-icons, close window, stand by. Folders Size and cascade, windows folder construction, construction choose file or 'older find, file or folder copy past**
Week 6	**Window Operating System** **Desktop, Mouse, my computer-icons, close window, stand by. Folders Size and cascade, windows folder construction, construction choose file or 'older find, file or folder copy past**
Week 7	Mid-term Exam + **Microsoft Word** **Introduction. Create new file, setup new page + save the files. Coordinating the cells and the worksheet window. Editing the cells. Columns and tables borders and shading. Inserting graphics, text, and entering formulas inside the program window. Printing and printing setu**
Week 8	Sinusoidal Forcing, Complex Forcing, Phasors, and Complex Impedance, Sinusoidal Steady State Response**Microsoft Word** **Introduction. Create new file, setup new page + save the files. Coordinating the cells and the worksheet window. Editing the cells. Columns and tables borders and shading. Inserting graphics, text, and entering formulas inside the program window. Printing and printing setu**
Week 9	**Microsoft Excel** **Introduction. Menus and toolbars. Coordinating the cells and the worksheet window. Editing the cells. Operations of the calculating by using Microsoft Excel program. Drawing the charts by using Microsoft Excel program. Printing and printing options**
Week 10	**Microsoft Excel** **Introduction. Menus and toolbars. Coordinating the cells and the worksheet window. Editing the cells. Operations of the calculating by using Microsoft Excel program. Drawing the charts by using Microsoft Excel program. Printing and printing options**
Week 11	**Microsoft PowerPoint** **Introduction. The creating for PowerPoint slides. Using and modifying the design templates. Editing of the PowerPoint cells. Inserting pictures, text and tables in the presentation slides. Setup the auto showing of the presentation sides. Printing and printing setup to the PowerPoint slides**

Week 12	**Microsoft PowerPoint** **Introduction. The creating for PowerPoint slides. Using and modifying the design templates. Editing of the PowerPoint cells. Inserting pictures, text and tables in the presentation slides. Setup the auto showing of the presentation sides. Printing and printing setup to the PowerPoint slides**
Week 13	**Microsoft PowerPoint** **Introduction. The creating for PowerPoint slides. Using and modifying the design templates. Editing of the PowerPoint cells. Inserting pictures, text and tables in the presentation slides. Setup the auto showing of the presentation sides. Printing and printing setup to the PowerPoint slides**
Week 14	**Microsoft PowerPoint** **Introduction. The creating for PowerPoint slides. Using and modifying the design templates. Editing of the PowerPoint cells. Inserting pictures, text and tables in the presentation slides. Setup the auto showing of the presentation sides. Printing and printing setup to the PowerPoint slides**
Week 15	**Microsoft PowerPoint** **Introduction. The creating for PowerPoint slides. Using and modifying the design templates. Editing of the PowerPoint cells. Inserting pictures, text and tables in the presentation slides. Setup the auto showing of the presentation sides. Printing and printing setup to the PowerPoint slides**
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: **Fundamentals of Computer** **Method of operation, simple diagram of the components and units of the computer. Phase's computers and the development of computers and the data and information, Fields use of computers, Computer components, Types of Computers, Computer software. Devices of input and outp**

Week 2	Lab 2: **Fundamentals of Computer** **Method of operation, simple diagram of the components and units of the computer. Phase's computers and the development of computers and the data and information, Fields use of computers, Computer components, Types of Computers, Computer software. Devices of input and outp**
Week 3	Power point setting
Week 5	Lab 5: **Microsoft PowerPoint** **Introduction. The creating for PowerPoint slides. Using and modifying the design templates. Editing of the PowerPoint cells. Inserting pictures, text and tables in the presentation slides. Setup the auto showing of the presentation sides. Printing and printing setup to the PowerPoint slides**
Week 6	Lab 6: **Microsoft PowerPoint** **Introduction. The creating for PowerPoint slides. Using and modifying the design templates. Editing of the PowerPoint cells. Inserting pictures, text and tables in the presentation slides. Setup the auto showing of the presentation sides. Printing and printing setup to the PowerPoint slides**
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Fundamentals of computers.	Yes
Recommended Texts	A Practical Approach	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	**Integral Mathematics**	**Module Delivery**	
Module Type	**Core**	☒ **Theory**	
Module Code	**ATU23025**	☒ **Lecture**	
ECTS Credits	**5**	**Lab**	
SWL (hr/sem)	**125**	☐ **Tutorial**	
		☐ **Practical**	
		☐ **Seminar**	
Module Level	1	**Semester of Delivery**	1

Administering Department	3	**College**	2
Module Leader	Suha sabah shyaa	**e-mail**	suha.odah@atu.edu.iq
Module Leader's Acad. Title	Asst.lecturer	**Module Leader's Qualification**	MSC
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	01/06/2023	**Version Number**	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Differently Mathematics	**Semester**	1
Co-requisites module	None	**Semester**	--

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	22. To develop problem solving skills and understanding of circuit theory through the application of techniques. 23. To understand the methods of Mathematics moderns part.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 42. Recognize how find the part s of Functions Domain Range Equation of the straight line, Trigonometric functions and their sketches. Domain, Range, Inverse of functions, Absolute value, limits, Limits applications, Polar coordinates (general definition) Conic sections (general definition electrical circuits.

Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Methods of differentiation, Some applications of differentiation**

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

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

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
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	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	**Methods of differentiation, Some applications of differentiation**
Week 2	**Rates of change, Velocity and acceleration Differentiation of parametric equations**
Week 3	**Rates of change, Velocity and acceleration Differentiation of parametric equations**
Week 4	**Total differential, rates of change and small changes Maxima, minima and saddle points for functions of two variables**
Week 5	**Total differential, rates of change and small changes Maxima, minima and saddle points for functions of two variables**
Week 6	**Determinants and Matrices**
Week 7	Mid-term Exam + **Determinants and Matrices**.
Week 8	**The theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations**

Week 9	**The theory of matrices and determinants. Properties of matrix operations, matrix transpose, matrix inverse, Applications to linear equations**
Week 10	**. Cramer's Rule. Eigen values and eigenvectors.**
Week 11	**Integral calculus** **Standard integration**
Week 12	**Some applications of integration: Areas under and between curves. Mean and rms values. Volumes of solids of revolution.**
Week 13	**integration using algebraic substitutions, trigonometric substitutions, hyperbolic substitutions, and partial fractions**
Week 14	**Integration by parts** **Reduction formula**
Week 15	**Double and triple integrals**
Week 16	**Preparatory week before the final Exam**

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Mathematics& culcuas by john T, 2017	Yes
Recommended Texts		No

Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering

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