Academic Program Specification Form

University: Diyala
College : Engineering
Departments : Communication Engineering
Date of Form Completion :17/9/2023

Head of the Dept.

Date : 17 /9/2023

Dean's Assistant
For Scientific
Affairs
Date : 19 /9/2023

The College Quality
Assurance and University
Performance Manager
Date : 19 /9/2023

Dean of the college

Date :   /9/2023

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			

		Module Delivery	
Module Title	**Electrical Engineering Fundamentals II**		
Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	**COE 102**		
ECTS Credits	**8**		
SWL (hr/sem)	**200**		
Module Level	UGI	**Semester of Delivery**	2
Administering Department	BSc - COMM	**College**	Type College Code
Module Leader	Name:	**e-mail**	E-mail:
Module Leader's Acad. Title		**Module Leader's Qualification**	
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	12/06/2023	**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. This course deals with the basic concept of AC electrical circuits. 2. To understand ac voltage and current from a given circuit. 3. To understand Root Mean-Square (R.M.S.) & Average Value 4. To understand ac power Average power, Reactive power, Complex power. 5. To analysis the RL, RC, RLC circuit analysis 6. To perform mesh and Nodal analysis in AC circuit. 7. To develop problem solving skills and understanding of circuit theory through the application of techniques.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize advantages of use alternating current. 2. Recognize why using Sine Waveform 3. Define inductors and capacitors. 4. How generation of alternating voltages and currents. 5. Recognize Phasor representation of AC quantities. 6. Define Ohm's Law in AC. Circuits. 7. Identify the basic circuit elements and their applications. 8. Explain the two Kirchoff's laws used in circuit analysis. 9. Discuss the Sinusoidal Steady-State Analysis.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A - A.C. Fundamentals** Introduction, Sinusoids, Phasors, Phasor Relationships for Circuit Elements, Root Mean-Square (R.M.S.) & Average Values, Impedance and Admittance, [18 hrs] **Part B - A.C Circuit** Introduction, Capacitors, Series and Parallel Capacitors, Inductors, Series and Parallel Inductors, Series A.C. circuits, Parallel A.C. Circuits, Kirchhoff's Laws in the Frequency Domain, Impedance Combinations. [15 hrs] **Part C - Sinusoidal Steady-State Analysis** Nodal Analysis, Nodal Analysis with Voltage Sources, Mesh Analysis, Mesh Analysis with Current Sources, Superposition Theorem, Thevenin and Norton Equivalent Circuits [24 hrs] **Part D - Frequency Response** Series Resonance, Parallel Resonance, [6 hrs] Revision problem classes [6 hrs]

	Learning and Teaching Strategies استراتيجيات التعلم والتعليم
Strategies	**1. Behavior management** Behavior management strategies foster an atmosphere of mutual respect, reduce disruptive behavior and ensure students have an equal opportunity to fulfill their potential in the classroom. It's crucial to provide them with both a positive and productive learning environment. Examples include establishing a reward system with an interactive chart where students move up or down depending on their performance and behavior in class. **2. Blended learning** With a blended learning teaching strategy, technology is incorporated with traditional learning. This allows students to work at their own pace, research their ideas and become more physically engaged during lessons. Examples include providing interactive tablets or whiteboards with engaging activities and posting classwork online for easier access. **3. Cooperative learning** Group work is a cooperative learning strategy that allows students with various learning levels to work together. By encouraging them to express their own ideas and listen to others' ideas as a group, you help students develop communication and critical thinking skills. Examples include solving math puzzles together, performing skits as a team or working on group presentations. **4. Formative assessment** A formative assessment is used periodically to monitor student learning incrementally. This can more effectively measure the process of learning as opposed to end-of-unit tests and can help you to improve your teaching methods throughout the year. Examples of this teaching strategy include self-evaluation exercises and summarizing a topic in multiple ways. **5. Student-led teaching** The student-led teaching strategy lets students become the teacher. In a classroom with learners at different levels, you can better engage those learning faster by showing them how to teach and give feedback to their peers. They may team-teach or work in groups to teach a new topic. Examples include letting a student teach an entire lesson or having advanced writers lead a peer-editing session as well as provide constructive criticism.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	105	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	95	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
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 and 12	LO #1, #4 and #8, #11
	Assignments	2	10% (10)	3 and 13	LO #3, #4 and #10, #14
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	14	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: AC Circuits, A.C. Fundamentals, Types of waveforms
Week 2	• Definition of: Waveform, Instantaneous value, Cycle, Time period, Frequency, Amplitude, Peak-to-peak value, Phase, Phase angle, Phase difference, Angular Frequency
Week 3	Root-Mean-Square (R.M.S.) & Average Values
Week 4	• Capacitors, Series and Parallel Capacitors • Inductors, Series and Parallel Inductors

Week 5	• A.C. Through Resistance, Inductance and Capacitances
Week 6	Series A.C. circuits
Week 7	Parallel A.C. circuits: Vector or Phasor Method, Admittance Method (Y), Complex or Phasor Algebra
Week 8	**Mid-term Exam**
Week 9	• Kirchhoff's Laws in the Frequency Domain • Impedance Combinations • Star-to-Delta transformations
Week 10	Sinusoidal Steady-State Analysis: Nodal Analysis, Mesh Analysis
Week 11	Sinusoidal Steady-State Analysis: Mesh Analysis
Week 12	Circuit Theorems: Superposition, Source Transformation
Week 13	Circuit Theorems: Thevenin and Norton Equivalent Circuits
Week 14	AC Power Analysis: Power Triangle, Power Factor, Complex Power
Week 15	Frequency Response: Series Resonance, Parallel Resonance
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: A.C. Measurement Instruments
Week 2	Lab 2: Introduction to Oscilloscope
Week 3	Lab 3: Inductors
Week 4	Lab 4: Capacitors
Week 5	Lab 5: Ohm's Law in A.C. Circuits
Week 6	Lab 6: Series and Parallel Combinations
Week 7	Lab 7: Star-Delta Transformations
Week 8	Lab 8: Kirchhoff's Laws in the Frequency Domain
Week 9	Lab 9: Superposition theorems
Week 10	Lab 10: Thevenin's theorems
Week 11	Lab 11: Norton's theorems
Week 12	Lab 12: Power in AC circuit

Week 13	Lab 13: Series Resonance
Week 14	Lab 14: Parallel Resonance
Week 15	**Final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Theraja, B. L. **A Textbook of Electrical Technology-Volume I (Basic Electrical Engineering)**. Vol. 1. S. Chand Publishing, 2005. • C.K. Alexander and M.N.O Sadiku, **Fundamentals of Electric Circuits**, McGraw-Hill Education, Fifth Edition, 2013	Yes
Recommended Texts	• Allan H. Robbins and Wilhelm C. Miller, **Circuit analysis: Theory and practice**, Cengage Learning, Fifth Edition, 2013. • Nilsson, James William, **Electric circuits**, Pearson Education India, 2008.	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.