MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Electric Circuits I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory**	
Module Code	**EPE 203**			☒ **Lecture**	
ECTS Credits	**7**			☒ **Lab**	
SWL (hr/sem)	**175**			☒ **Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Level	1		**Semester of Delivery**	1	
Administering Department	Type Dept. Code		**College**	Type College Code	
Module Leader	Name: ammar Issa Ismael		**e-mail**	E-mail: ammarissa@uodiyala.edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	M.Sc.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	01/06/2024		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى

Prerequisite module	**Fundamental of electrical engineering I**	**Semester**	second
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 advance of electrical circuits. 2. To analysis of circuits with non – sinusoidal waves, illustrative different applications. 1. To understand the concept of mutual inductance. 2. To develop problem solving skills and understanding the Fourier series and coefficients. 3. To understand Locus Diagrams. 4. To analysis Electric Transients. 5. To perform application of computers in solving circuit problems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how solve advance electrical circuits. 2. List the various terms associated with electrical circuits. 3.Summarize what is meant by applications electric circuit. 4.Discuss the reaction and involvement of the concept of mutual inductance. 5.Describe electric Locus Diagrams. 6.Define Electric Transients. 7.Identify and analysis of circuits with non – sinusoidal waves. 8.Discuss the concept of mutual inductance. 2. Explain the Fourier series.

	3. Identify the solving circuit problems by computer.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A- Non – Sinusoidal Waves** The Fourier series, Fourier coefficients, analysis of circuits with non – sinusoidal waves, illustrative applications, active power calculations with periodic functions, r.m.s value of periodic functions [18 hrs] **Part B_ Circuits with Mutual inductance** : The concept of mutual inductance, polarity and the dot convection, the ideal transformer, equivalent circuits for magnetically coupled coils, Transformer. [15 hrs] **Part C - Locus Diagrams** Concept, locus diagrams of simple series and parallel circuit [12 hrs] **Part D - Locus Diagrams** The natural and forced response of series and parallel circuits, circuit with zero and non-zero initial conditions [12 hrs] **Part E – the computer applications** Application of computers in solving circuit problems [12 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	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

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	1	10% (10)	3 and 13	LO #3, #4 and #10, #14
	Projects / Lab.	1	5% (5)	Continuous	All
	Report	1	5% (5)	14	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	20% (20)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	• Non – Sinusoidal Waves

Week 2	• The Fourier series, Fourier coefficients,
Week 3	• The Fourier series, analysis of circuits with non – sinusoidal waves
Week 4	• illustrative applications, active power calculations with periodic functions, r.m.s value of periodic functions
Week 5	• Circuits with Mutual inductance: The concept of mutual inductance.
Week 6	• Circuits with Mutual inductance : polarity and the dot convection.
Week 7	• the ideal transformer, equivalent circuits for magnetically coupled coils, Transformer
Week 8	**Mid-term Exam**
Week 9	Locus Diagrams: Concept.
Week 10	locus diagrams of simple series and parallel circuit
Week 11	Electric Transients (Classical Method):
Week 12	The natural and forced response of series circuits, circuit with zero and non zero initial conditions
Week 13	The natural and forced response of parallel circuits, circuit with zero and non zero initial conditions
Week 14	Application of computers in solving circuit problems
Week 15	Application of computers in solving circuit problems
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Required Texts	• 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