Ministry of Higher Education and
Scientific Research - Iraq

University of Warith Al_Anbiyaa
Engineering College
Biomedical Engineering Department

MODULE DESCRIPTION FORM

Module Information				
Module Title	Electrical Networks		**Module Delivery**	
Module Type	Basic		☒ Theory	
Module Code	BME-221		☒ Lecture	
ECTS Credits	3		Lab ☐ Tutorial	
SWL (hr/sem)	75		☐ Practical ☐ Seminar	
Module Level		**Semester of Delivery**		1
Administering Department	BME	**College**	ENG	
Module Leader	Hussein Abdulkareem Saleh	**e-mail**	Hussein.abd@uowa.edu.iq	
Module Leader's Acad. Title	Assistant Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**		
Scientific Committee Approval Date		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	1. Teach the student the basics of networks engineering and its mathematics. 2. Enabling students to obtain knowledge and understanding in analyzing complex circuits and behavior operation amplifier. 3. The student's understanding of the behavior of signals in the frequency range, how to convert from time domain to frequency domain. 4. Enabling students to obtain knowledge and understanding of filters for different signals and frequency bands. 5. Enabling students to obtain knowledge and understanding of how embedding and how to analyze steady state and transient cases. 6. Enable students to obtain knowledge, understanding, analysis and syntax of various modulation types of RC and RL as well RCL. 7. Enable students to obtain knowledge, understanding, analysis and synthesis of the various modulation types of operation amplifier circuits like inverting and non-inverting and else circuits. 8. Enable the students to obtain knowledge, understanding, analysis and synthesis of methods for including mixing between series and shunt circuits. 9. Enable students to obtain knowledge, understanding and analysis of important electric circuits simple and complex. 10. Students' understanding of the causes of transient in networks and the method of mathematical analysis and methods of treatment.
Module Learning Outcomes	1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics. 2. An ability to apply engineering design process to produce solutions that meet specified needs with consideration of public health, safety, and global, cultural, social, environmental, economic, and other factors as appropriate to the discipline.
Indicative Contents	Indicative content includes the following. Operation amplifier, CMRR offset voltage, Frequency response, DC and AC transient, Analyze dependent and independent sources, First order circuits, Second order circuits, Laplace analysis for first order circuits and second order circuits.

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

Student Workload (SWL)

Structured SWL (h/sem)	48	Structured SWL (h/w)	3
Unstructured SWL (h/sem)	27	Unstructured SWL (h/w)	1
Total SWL (h/sem)	75		

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

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Introduction
Week 2	Operation amplifier
Week 3	CMRR offset voltage
Week 4	Frequency response
Week 5	Open loop and Close loop-Comparator – Integrator.
Week 6	DC and AC transient
Week 7	DC and AC transient- Pulse wave forms -RC response- Pulse definition- Duty cycle R-C response to the square wave input- Frequency domain analysis
Week 8	Explain many functions- Dependent active filter -Impulse function -Ramp function- Step function.

Week 9	Analyze dependent and independent sources
Week 10	Analyze dependent and independent sources
Week 11	Explain and analyze first and second order by using Laplace transform
Week 12	First order circuits
Week 13	Second order circuits
Week 14	Laplace analysis for first order circuits and second order circuits
Week 15	Two Port Networks, Admittance, Impedance, Hybrid, and Transmittance Parameters
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
	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	George B. Thomas Jr., "CALCULUS", 14th Ed	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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