



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
Module Title	Electrical technology		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	TEMO 101		
ECTS Credits	4		
SWL (hr/sem)	150		
Module Level	1	Semester of Deliver	4
Administering Department	PM	College	TEMO
Module Leader	Safwan Assaf Hamoodi The file (module description form of electrical and electronic engineering) prepared by Prof. Dr. Haitham M. Wadullah	e-mail	Safwan79azb@ntu.edu.iq dr.haitham@ntu.edu.iq
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	1/6/2023	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 Objectives	<ol style="list-style-type: none"> 1. Preparing the student to study the different calculations in alternating current and direct current circuits, and to get acquainted with the various theories to study these calculations. 2. Understanding electrical principles and concepts: The module aims to provide students with a clear understanding of electrical principles and concepts, including voltage, current, resistance, and power. Students will learn how these concepts are applied in electrical circuits and systems. 3. Developing practical skills in electrical measurements and testing: The module aims to equip students with practical skills in using electrical instruments and equipment for measurements and testing. Students will learn how to perform accurate measurements, interpret the results, and troubleshoot electrical systems. 4. Applying knowledge to electrical machines and power systems: The module aims to enable students to apply their knowledge of electrical technology to the operation and maintenance of electrical machines, such as motors and generators. Students will also gain an understanding of power systems and their components, including power generation, transmission, and distribution.
Module Learning Outcomes	<ol style="list-style-type: none"> 1. Understanding electrical circuit theory: Students will gain knowledge of fundamental electrical circuit theory, including concepts such as voltage, current, resistance, and power. They will be able to apply this understanding to analyze and solve basic electrical circuits. 2. Proficiency in electrical measurements and testing: Students will develop skills in using electrical instruments and equipment to measure and test electrical parameters. They will learn how to interpret measurement results and troubleshoot electrical systems to identify faults. 3. Application of electrical machines and power systems: Students will learn about electrical machines, such as motors and generators, and their operating principles. They will understand the characteristics and applications of these machines. Additionally, they will gain a basic understanding of power systems, including power generation, transmission, and distribution.
Indicative Contents	<p><u>Part A -</u></p> <ol style="list-style-type: none"> 1. Basic Electrical Principles, Electrical Measurements and Instruments [20 hrs] 2. Electrical Machines, Power Systems, Electrical Safety, Direct current circuit [20 hrs] 3. Revision and quiz [1.5 hrs] <p><u>Part B –</u></p> <p>Alternating current circuit, Circuit Theory, Analogue Electronics Control Systems [20 hrs]</p> <ol style="list-style-type: none"> 4. , Renewable Energy, Troubleshooting and Maintenance [10 hrs] <p>Revision and quiz [1.5 hrs]</p>

Learning and Teaching Strategies	
Strategies	<ol style="list-style-type: none"> 1. Active Engagement: Actively engage with the subject matter by participating in class discussions 2. Practice Problem Solving: Electrical Technology involves problem-solving skills. 3. Hands-on Experience: Gain practical experience by participating in laboratory sessions and hands-on projects. 4. Collaborative Learning: Engage in group discussions and study sessions with classmates. 5. Utilize Resources: Take advantage of resources such as textbooks, online tutorials, video lectures, and educational websites to supplement your learning. 6. Time Management: Create a study schedule and allocate dedicated time for studying Electrical Technology. 7. Review and Recap: Regularly review previously covered topics to reinforce your understanding and retain information.

Student Workload (SWL)			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		



Module Evaluation					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1and #2
	Assignments	2	5% (5)	2 and 12	LO #2 and #3
	Projects / Lab.	9	15% (15)	Continuous	LO #1 and #3
	Report	1	10% (10)	13	LO #3
Summative assessment	Midterm Exam	2hr.	10% (10)	7	LO #1 - #2
	Final Exam	2hr.	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
	Material Covered
Week 1	Symbols and abbreviations, electric circuit and its elements
Week 2	The direct-current network (Kerchief's law & their use in network analysis)
Week 3	Conversion of delta-connected resistance into an equivalent Wye connection & vice versa
Week 4	Power sources connected in parallel, node voltage method
Week 5	Loop current method.
Week 6	Super position method.
Week 7	Thevenin's theorem and Norton's theorem.
Week 8	Maximum power transfer.
Week 9	Reciprocity theorem
Week 10	Sinusoidal excitation, average, effective values and their steady- state analysis
Week 11	Generation of alternating current, sinusoidal current
Week 12	The mean values of current and voltage
Week 13	Complex Frequency, s-Plane, Poles and Zeros, Response Function, Bode Plots
Week 14	Frequency Response of Series/Parallel Resonances, High-Q Circuits
Week 15	Mutual Inductance, Linear and Ideal Transformers, Circuits with Mutual Inductance
Week 16	Final Examination



Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1	Lab 1: : Introduction to Agilent VEE and PSPICE
Week 2	Lab 2: Kirchhoff's Laws
Week 3	Lab 3: series circuit
Week 4	Lab 4: Parallel circuit
Week 5	Lab 5: Thévenin's Theorem.
Week 6	Lab 6: Norton's Theorem.
Week 7	Lab 7: Y-connection delta-connection
Week 8	Lab 8: Second-Order Transient Responses
Week 9	Lab 9: Frequency Response of RC Circuits
Week 11	Lab 10: Frequency Response of RLC Circuits
Week 12	Lab 11: Filters
Week 13	Lab 12: AC circuit
Week 14	Lab 13: sine wave form
Week 15	Lab 14: Review

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	<ol style="list-style-type: none"> 1. "Electric Machinery and Power System Fundamentals" by Stephen J. Chapman 2. "Electricity and Electronics for HVAC" by Rex Miller and Mark R. Miller 3. "Principles of Electric Machines and Power Electronics" by P.C. Sen 4. "Electrical Power Systems: Design and Analysis" by Mohamed E. El-Hawary 	
Recommended Texts	<ol style="list-style-type: none"> 1. "Electrical Wiring Residential" by Ray C. Mullin and Phil Simmons 2. "Industrial Electrical Troubleshooting" by Lynn Lundquist 3. "Electrical Safety Handbook" by John Cadick, Mary Capelli - Schellpfeffer, and Dennis Neitzel 4. "Digital Control Systems" by Benjamin C. Kuo 5. "Electromechanical Energy Conversion" by David J. Braun 	
Websites	<ul style="list-style-type: none"> • (www.allaboutcircuits.com) • (www.electrical4u.com) • (www.khanacademy.org) 	



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
<p>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.</p>				

Module 1

Code	Course/Module Title	ECTS	Semester
TEMO 101	Electrical technology	6	1
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/sem)
2	3	78	72
Description			
<p>Electrical technology encompasses the study of electrical systems, circuits, devices, and their applications. It focuses on understanding the principles and theories behind electricity, electrical power generation, transmission, and distribution. This field involves the design, installation, maintenance, and troubleshooting of electrical systems in various industries, such as power generation, manufacturing, telecommunications, and transportation. Electrical technology professionals work with electrical equipment, control systems, and renewable energy technologies. They are skilled in analyzing electrical circuits, performing measurements, and ensuring safety and compliance with electrical codes and standards. A strong foundation in electrical technology enables individuals to contribute to the development and advancement of electrical systems, energy efficiency, and the integration of new technologies in the field.</p>			