



Ministry of Higher Education and
Scientific Research – Iraq
Al-Furat Al-Awsat Technical University
Al-Musaib Technical College
Department of Electrical Engineering Techniques



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Delivery		ADVANCED POWER ENGINEERING	Module Title
Theory ✓ Lecture Lab ✓ Tutorial Practical ✓ Seminar ✓	CORE		Module Type
	EET306		Module Code
	5		ECTS Credits
	125		SWL (hr/sem)
2	Semester of Delivery	U	Module Level
AL-FURAT AL-AWSAT TECHNICAL UNIVERSITY AL-MUSAIB TECHNICAL COLLEGE		College	Administering Department
		e-mail	Module Leader
PhD	Module Leader's Qualification	Professor	Module Leader's Acad. Title
	None	e-mail	Module Tutor
	None	e-mail	Peer Reviewer Name
1.0	Version Number	14/06/2023	Review Committee Approval

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
	Semester	None	Prerequisite module
	Semester	None	Co-requisites module

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
The aim of the module on Basic Electrical Power Engineering is to provide students with a foundational understanding of the principles, concepts, and applications related to electrical power systems. The module aims to introduce students to the fundamental knowledge and skills necessary for further study and specialization in electrical power engineering. Learning Outcomes: Demonstrate a basic understanding of electrical power systems, their components, and their operation. -1 Apply fundamental mathematical and analytical techniques to solve basic problems in power systems. -2 Recognize and explain the different types of power generation, transmission, -3	Module Objectives أهداف المادة الدراسية

and distribution technologies. Identify basic safety considerations and regulations in electrical power engineering. -4 Demonstrate effective communication of basic electrical power engineering concepts, both orally and in written form. -5 Indicative Contents: Introduction to Electrical Power Systems: Overview of electrical power systems and their components. Basic concepts and definitions in electrical power engineering. Circuit Analysis Techniques: Introduction to different types of power generation, such as thermal, hydro, and renewable. Overview of power plants and their operation. Power Transmission and Distribution: Introduction to transmission and distribution systems. Overview of transformers, transmission lines, and distribution networks. Safety and Regulations	
Demonstrate a basic understanding of electrical power systems, including their components, operation, and key principles. -1 Apply fundamental mathematical and analytical techniques to solve basic problems in electrical circuits and power systems. -2 Recognize and explain the various types of power generation, transmission, and distribution technologies used in electrical power systems. -3 -4 Understand and adhere to basic safety considerations and regulations in electrical power engineering. -5	Module Learning Outcomes مخرجات التعلم للمادة الدراسية
Indicative content includes the following: Part A – Transmission line performance. • Transmission line performance: Short line, Transmission line performance: Medium line, General Network Constants A,B,C and D, [20 hrs] Part B Underground cables. • Underground cables construction, types of cables, operating voltage, stress of cables methods of decreasing stress [10 hrs] Part C Symmetrical components and sequences • Symmetrical components +ve, -ve and zero sequence the circuit in unbalance condition analysis at unbalance condition [20 hrs] Part D HVDC • High voltage DC converter, filters, transmitting and receiving power transmission on DC [8 hrs] Revision problem classes [2 hrs] •	Indicative Contents المحتويات الإرشادية

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

1-Hands-on Experiments: Engage students in practical experiments to deepen their understanding of circuits. 2-Simulation Software: Use circuit simulation software for virtual circuit design and analysis. 3-Problem-solving Exercises: Include various problem-solving exercises to apply circuit analysis techniques. 4-Group Projects: Assign collaborative projects for circuit design and construction. 5-Real-world Applications: Discuss practical applications of circuits in different devices and systems. 5-Interactive Discussions: Encourage student participation and critical thinking through open-ended questions. 6-Conceptual Understanding: Focus on intuitive understanding alongside mathematical analysis. 7-Assessment Variety: Use diverse assessment methods to gauge student understanding. 8-Office Hours and Support: Offer individualized assistance through office hours or online support.	Strategies
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Student Workload (SWL)

الحمل الدراسي للطالب

4.2	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	63	Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل
4.13	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	62	Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل
		125	Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل

Module Evaluation

تقييم المادة الدراسية

Relevant Learning Outcome	Week Due	Weight (Marks)	Time/Number		
LO #2, 4,5	10,5	)10(10%	6	Quizzes	Formative assessment
LO # 3, 4,	12,2	)10(10%	8	Assignments	
All	Continuous	)10(10%	7	Projects / Lab.	
All	Continuous	)10(10%	8	Report	
LO # 1-5	8	)10(10%	2 hr	Midterm Exam	Summative assessment
All	15	)50(50%	3 hr	Final Exam	
		100% (100 Marks)	Total assessment		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

Material Covered	
Transmission line performance: Short line	1
Transmission line performance: Medium line	2,3
General Network Constants A,B,C and D	4,5
Underground Cables	6,7
Symmetrical Components	8,9

Positive, Negative, and Zero sequence reactance diagram	10,11,12
HVDC Transmission system	13,14
Final Examination	15

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Material Covered	
Transmission line model loading capacitive load	1
Calculation of the parameter for three-phase transformers	2
Visit to transforming sub-station	3
Line characteristic for resistive load	4
Line characteristic for inductive load	5
Line characteristic for capacitive load	6
Voltage drop in the transmission line	7
Visit to diesel generating station	8
Determination of sequence current	9
Visit to gas turbine generating station	10
Oil test	11
Visit to hydroelectric generating station	12
Visit to thermal generating station	13
Review	14

Learning and Teaching Resources مصادر التعلم والتدريس	
Available in the Library?	Text
Yes	P. V. Gupta, M. L. Soni, A course in Electrical Power
No	P. V. Gupta, Transmission and Distribution
https://books.google.iq/books/about/A_Course_in_Electrical_Power.html?id=j3B5AQAACAAJ&redir_esc=y	

APPENDIX:

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

NB 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.