Ministry of Higher Education and
Scientific Research – Iraq
AL-Mustaqbal University
Department of Electrical Engineering techniques

نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Principles of Power Engineering**	**Module Delivery**
Module Type	**Core**	☒ **Theory**
Module Code	**UOMO0205051**	☐ **lecture**
ECTS Credits	**5**	☒ **Lab**
SWL (hr/sem)	**150**	☐ **Tutorial**
		☒ **Practical**
		☒ **Seminar**

Module Level	3	**Semester of Delivery**	1
Administering Department	Electrical Engineering Techniques	**College**	AL-Mustaqbal University
Module Leader	Zaidoon waleed	**e-mail**	zaidoon.waleed@mustaqbal-college.edu.iq
Module Leader's Acad. Title	doctor	**Module Leader's Qualification**	doctor
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	29/11/2025	**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	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

أهداف المادة الدراسية	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: 1- Demonstrate a basic understanding of electrical power systems, their components, and their operation. 2- Apply fundamental mathematical and analytical techniques to solve basic problems in power systems. 3- Recognize and explain the different types of power generation, transmission, and distribution technologies. 4- Identify basic safety considerations and regulations in electrical power engineering. 5- Demonstrate effective communication of basic electrical power engineering concepts, both orally and in written form. 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
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Demonstrate a basic understanding of electrical power systems, including their components, operation, and key principles. 2- Apply fundamental mathematical and analytical techniques to solve basic problems in electrical circuits and power systems. 3- Recognize and explain the various types of power generation, transmission, and distribution technologies used in electrical power systems. 4- Understand and adhere to basic safety considerations and regulations in electrical power engineering.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: • <u>Part A – General Electric power System.</u>

	Constituent parts of an electrical power system: Basic structure of power system, Comparison of Conductor Materials in overhead systems, [20 hrs] • Part B Overhead line insulator. Overhead line insulator structure, martials, characteristics of insulators, stress in insulators, string efficiency, string efficiency modified, corona losses, voltage disruptive [12 hrs] • Part C Transmission Constants Transmission Constants: Line inductance, single phase three phase and double circuit, Line capacitance, single, three phase, double circuit and effect of earth and substations [24 hrs] • Revision problem classes [6 hrs]

Learning and Teaching Strategies

اس رتاتيجيات التعلم والتعليم

Strategies	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.

Student Workload (SWL)

الحمل الدرا يس للطالب

Structured SWL (h/sem) الحمل الدرا يس المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدرا يس المنتظم للطالب أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدرا يس غ رت المنتظم للطالب خلال الفصل	62	**Unstructured SWL (h/w)** الحمل الدرا يس غ رت المنتظم للطالب أسبوعيا	4.1
Total SWL (h/sem) الحمل الدرا يس الك يل للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبو يع النظري

	Material Covered
1	Basic structure of power system
2,3	Comparison of Conductor Materials in overhead systems
4,5	Mechanical and Electrical design of overhead Transmission system
6,7	Overhead line insulator
8	Corona
9,10,11	Transmission Constants: Line inductance, single phase three phase and double circuit
12,13	Line capacitance, single, three phase, double circuit and effect of earth
14	Substations
15	Final Examination

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبو يع للمخت.ت

	Material Covered
1	introduction to the lab. equipment's
2	load curve and load factor
3	voltage drop in the distribution lines
4	loading the distribution transformer by star connected resistive load (balance and unbalance)
5	loading the distribution transformer by star connected inductive load (balance and unbalance)

6	loading the distribution transformer by delta connected resistive load (balance and unbalance)
7	loading the distribution transformer by delta connected inductive load (balance and unbalance)
8	power factor improvement
9	introduction to underground cables
10	transmission line model
11	transmission line model test
12	transmission line model loading resistive load
13	transmission line model loading inductive load
14	review

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	P. V. Gupta, M. L. Soni, A course in Electrical Power	Yes
Recommended Texts	P. V. Gupta, Transmission and Distribution	No
Websites	**Electrical power 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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
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.