



Electrical and Renewable Energy Engineering Program

Course Specification - (2025-2026)

Energy Resources and Renewable Energy – ERE111

Academic Year	2025/2026	Semester	Fall
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1. Basic Information

Course Title (according to the bylaw)	Energy Resources and Renewable Energy				
Course Code (according to the bylaw)	ERE111				
Prerequisite:	--				
Department/s participating in delivery of the course	Electrical and Renewable Energy Engineering				
Number of credit hours/points of the course (according to the bylaw)	Credit Hours	Contact Hours			
		Lecture	Tutorial	Practical	Total
	2	2	1	0	3
Course Type	Compulsory - Major Requirements of Electrical and Renewable Energy Engineering				
Academic level at which the course is taught	Second Level				
Academic Program	Bachelor of Engineering of Electrical and Renewable Energy				
Faculty/Institute	Faculty of Engineering				
University/Academy	Nahda University				
Name of Course Coordinator	Dr. Hassan Moh. Mahmoud				
Course Specification Approval:	Department council			Faculty council	
Date of Approval of the course Specification:	13 / 9 / 2025			16 / 9 / 2025	



1. Course Overview

Overview of energy use and related issues, Identifying all energy resources: thermal, chemical, nuclear, kinetic, gravitational field, magnetic field, electric field. Rank and classification of different energies. Regenerative energy resources: solar, wind, biomass, wave energy, geothermal. Energy transfer, conversion, transmission, and storage. Climate change and sustainability issues. Cautionary and safety measures.

2. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics	CLO1	Recognize the types of energy conversion systems
		CLO2	Explain the theory of operation of different energy conversion systems
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies	CLO3	Evaluate the relevance and reliability of information from various learning resources.
B3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.	CLO3	Analyze system requirements and constraints for designing engineering components and subsystems.
		CLO4	Design electrical/electronic/digital components, modules, and systems to meet specified requirements.
D2	Identify, analyze and evaluate the energy's conversion processes and management techniques;	CLO5	Analyze the energy's conversion processes and management techniques



3. Teaching and Learning Methods

1. Interactive Lectures
2. Self-learning
3. Tutorials.
4. Field Visit

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours				
			Lecture Hours	Tutorial Hours	Practical Hours	Self-learning (Ass/ Project)	Other
1	Course Introduction	5	2	1	0	2	-
2	Energy Conservation and Forms of Energy (Parts 1&2)	5	2	1	0	2	-
3	Energy Conservation and Forms of Energy (Parts 1&2)	5	2	1	0	2	-
4	Renewable Energy + Solar energy (solar radiation, Greenhouse effect and PV) parts 1&2	5	2	1	0	2	-
5	Renewable Energy + Solar energy (solar radiation, Greenhouse effect and PV) parts 1&2	7	2	1	0	2	Quiz 1 (2 Hr)
6	Wind energy Parts 1&2	5	2	1	0	2	-
7	Mid Term Exam						
8	Wind energy Parts 1&2	5	2	1	0	2	-
9	Solar Energy application (Solar water heating and other solar thermal applications) parts1&2	5	2	1	0	2	-
10	Solar Energy application (Solar water heating and other solar thermal applications) parts1&2	7	2	1	0	2	Quiz 2 (2 Hr)
11	Hydropower energy Parts 1&2	5	2	1	0	2	-
12	Hydropower energy Parts 1&2	5	2	1	0	2	-
13	Biomass energy and bioenergy Wave and tidal power energy	5	2	1	0	2	
14	Renewable energy Future and Smart Grid	5	2	1	0	2	-
15	Revision	5	2	1	0	2	-
16	Final Term Exam						



4. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Mid-term written Exam	7	20	20%
2	Final Written Exam	16	40	40%
3	Assignments	1-14	10	10%
4	Quizzes	5,10	20	20%
5	Attendance	1-15	10	10%

5. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course	<i>Renewable Energy: Power for a Sustainable Future (4th Edition)</i> Oxford University Press, Boyle, G. (Ed.) (2022)
	Other References	1) <i>Fundamentals of Power Electronics (3rd Edition)</i> , Erickson, R. & Maksimović, D. (2020) 2) <i>Power System Stability and Control (Updated Edition)</i> , Kundur, P. et al. (2022) 3) <i>Solar Energy Engineering: Processes and Systems (3rd Edition)</i> Academic Press (Elsevier), Kalogirou, S. A. (2023) 4) <i>Energy Conversion Systems</i> Springer, Chen, W. & Wang, J. (2021)
	Electronic Sources	www.ekb.eg
	Learning Platforms	https://lms.nub.edu.eg/login/index.php
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	White Board
	Electronic Programs	—
	Skill Labs/ Simulators	—
	Virtual Labs	—
	Other (to be mentioned)	Lecture Hall

Dr. Hassan Moh. Mahmoud
Course Coordinator

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