



Electrical and Renewable Energy Engineering Program

Course Specification - (2025-2026)

Energy Graduation Project (1) – ERE321

Academic Year	2025/2026	Semester	Spring
---------------	-----------	----------	--------

1. Basic Information

Course Title (according to the bylaw)	Energy Graduation Project (1)				
Course Code (according to the bylaw)	ERE321				
Prerequisite:	After completing 115 Cr. hrs.				
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	Contact Hours			
	Hours	Lecture	Tutorial	Practical	Total
	3	1	0	4	5
Course Type	Compulsory - Major Requirements of Electrical and Renewable Energy Engineering				
Academic level at which the course is taught	Fourth 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. Mohamed Kourany Saad				
Course Specification Approval:	Department council		Faculty council		
Date of Approval of the course Specification:	13 / 9 / 2025		16 / 9 / 2025		



2. Course Overview

The aim of the project is to give students a major design experience that will both develop and demonstrate the knowledge and skills acquired in earlier course work and will incorporate engineering standards and realistic constraints including economic, environmental, sustainability, manufacturability, ethical and safety considerations. In addition, the project should represent an actual problem or need of the industry or the community. The purpose of Part 1 of the Graduation Project is to explore a chosen topic and to discover and define the project problem. After initial introductory lectures, students will perform research work to explore different approaches to the problem at hand. Based on this research study, students will perform system level analysis to explore project feasibility and reach an initial high level design or system architecture and specifications. The output of Project 1 is a major report outlining the project feasibility results and laying the ground for the detailed design and implementation phase to be conducted in Project 2. This document should include a detailed project plan indicating major project implementation milestones with clear assignment of tasks among project team members.

3. 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	Recall the undergraduate background to tie it with the surrounding environment to find the project idea.
A3	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development	CLO10	Develop the business model for the project and time plan for the development progress, and then write down a robust report defining all phases of the project.



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
A4	Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.	CLO2	Recognize the codes and standards that govern the design and construction of the project and make a preliminary design according to these codes and standards.
A5	Practice research techniques and methods of investigation as an inherent part of learning.		
A6	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.	CLO3	Discuss the requirements of the project with the different trades and coordinate between each other in addition to the exchange of the different project data
A7	Function efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.	CLO4	Perform the detailed calculations of the project parts and collect the different parts calculations to complete the whole project calculations.
A8	Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.	CLO5	Present the project design in the form of drawings and report to illustrate the design to the other group members and the supervisor.
A9	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	CLO6	Analyze the received comments on the design and any problems associated with the operation.
A10	Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.	CLO7	Modify the design to comply with the received comments and finalize the project design.
B1	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.	CLO8	Develop the accurate designs of subsystems or systems in electrical/electronic/digital/mechanical engineering.
B2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.		



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
B3	Design and implement: elements, modules, sub-systems or systems in electrical / electronic / digital engineering using technological and professional tools.		
B4	Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.		
B5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.		
D1	Model, analyze and design physical systems applicable to the specific discipline by applying the concepts of: Thermodynamics, Heat Transfer, Fluid Mechanics, solid Mechanics, Material Processing, Material Properties, Measurements, Instrumentation, Control Theory and Systems, Mechanical Design and Analysis, Dynamics and Vibrations.		
D2	Identify, analyze and evaluate the energy's conversion processes and management techniques.	CLO9	Develop the accurate designs of renewable energy conversion systems.
D3	Model, analyze, design, implement, test and operate renewable energy systems such as solar photovoltaics, solar thermal, wind, biomass and waste, hydro-tidal and wave, and other renewable energy applications.		
D4	Select, analyze and control appropriate driving systems for different energy applications.		



4. Teaching and Learning Methods

1. Interactive Lectures
2. Discussion
3. Self-Learning
4. Experimental Learning
5. Field Visits
6. Report and Research
7. Projects
8. Brain storming

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 (Assignments/ Presentation/Reports)
1	Lecture: Introduction, course description, project selection, project feasibility study and sustainability. Background versus the surrounding environment equals good project idea. Lab: Discussing the Literature review about project idea.	5	1	0	4	0
2	Lecture: Gantt Chart for each project. Lab: Elaborating one of the designs for the project.	7	1	0	4	Assignment 1 (2 Hrs)
3	Lecture: Step by Step Report preparation essentials. Lab: Design and test of the simulation model for the project.	7	1	0	4	Assignment 2 (2 Hrs)
4	Lecture: Explaining the ways to archive and cite the resources Lab: Design and test of the simulation model for the project.	8	1	0	4	Report 1 (3 Hrs)
5	Lecture: Highlight the major project implementation milestones with clear	8	1	0	4	Presentation 1 (3Hrs)



	assignment of tasks among project team members. Lab: Searching for the suitable Components for each project. Check the availability in local market.					
6	Lecture: Pivot the team work and multi/ parallel task assignments. Lab: Approaching the final design with the available components.	7	1	0	4	Assignment 3 (2 Hrs)
7	Lecture: Modeling the powerful presentation skills Lab: Buy all the components and start assembly.	7	1	0	4	Assignment 4 (2 Hrs)
8	Lecture: Seminar for presenting the accomplished tasks. Lab: Project assembly, Cont.	7	1	0	4	Assignment 5 (2 Hrs)
9	Lecture: Seminar for presenting the accomplished tasks Cont. Lab: Project assembly, Cont.	7	1	0	4	Assignment 6 (2 Hrs)
10	Lecture: Seminar for presenting the accomplished tasks Cont. Lab: Project assembly, Cont.	8	1	0	4	Report 2 (3 Hrs)
11	Lecture: Measures for judging each project. Lab: Project assembly, Cont.	8	1	0	4	Presentation 2 (3Hrs)
12	Lecture: Measures for judging each project Cont. Lab: First Assessment of the project.	7	1	0	4	Assignment 7 (2 Hrs)
13	Lecture: Criticizing other projects. Lab: Design modification, report first draft submission	7	1	0	4	Assignment 8 (2 Hrs)
14	Lecture: Enhancement Plan. Lab: Check for available components, Report Revision	8	1	0	4	Report 2 (3 Hrs)
15	Lecture: Enhancement Plan Cont. Lab: Correction plan for the project. Final Report for Project 1.	8	1	0	4	Presentation 3 (3Hrs)



5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Student Activities (Presentations, assignments and reports)	Throughout all weeks	50	50%
2	Final/Oral Exam	16	50	50%

1. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	1) Student should visit EKB for finding resources for his project. https://www.ekb.eg/ar/login
	Other References	2) Course notes prepared by the instructor.
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show
	Supplies	White Board
	Electronic Programs	Homer, PVsyst, Matlab, Etap, Proteus, PowerWorld, Autocad, Reveit, Ecodial Software Programs, ...etc.
	Skill Labs/ Simulators	Faculty Labs and Simulators
	Virtual Labs	Internet Access
	Other	Lecture Hall and Laboratory Usage

Dr. Mohamed Kourany Saad
Course Coordinator

Dr. Mohamed Kourany Saad
Program Coordinator