Australian University

College of Engineering

Department of Petroleum Engineering

Diploma of
Renewable Energy Engineering

Program Description

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Prelude

As the global demand for sustainable energy solutions continues to grow, the need for skilled professionals in renewable energy has never been more urgent. In line with the Kuwait Vision 2035 objectives, this program responds to the country's strategic goals of sustainable development and economic diversification. In the face of environmental challenges and the ongoing transition to cleaner energy systems, the field of renewable energy engineering plays a pivotal role in shaping the future of energy production and consumption within Kuwait and beyond.

The “Diploma in Renewable Energy Engineering” is designed to equip students with the knowledge and practical skills necessary to lead this transformation. Through a blend of technical training, hands-on experience, and a focus on sustainability, this program prepares graduates to become key players in the renewable energy industry, directly supporting Kuwait’s national vision for a greener future. Students will explore cutting-edge technologies, learn to design and implement energy systems, and gain insights into the economic, environmental, and regulatory factors critical to advancing Kuwait’s commitment to a cleaner energy landscape.

This diploma program emphasizes Kuwait’s strategic ambition to reduce reliance on non-renewable resources, empowering students to develop solutions that address both local and regional energy needs sustainably. By building expertise in renewable energy technologies, graduates will be well-positioned to contribute to projects that help achieve the goals of Kuwait Vision 2035, making meaningful contributions to the nation’s shift toward a sustainable energy future.

With a curriculum that reflects the latest advancements and trends in renewable energy, this diploma program is a stepping stone for those looking to contribute to a greener, more sustainable world.

Table of Abbreviations

ABET	Accreditation Board for Engineering and Technology
AU	Australian University
CDIO	Conceive, Design, Implement, Operate
CEL	College Elective
CH	Credit Hours
CM	College Mandatory
CoH	Contact Hours
Co-R	Co-Requisite
DEL	Department Elective
DM	Department Mandatory
EA	Engineers Australia
Math	Mathematics
PBL	Project Based Learning
Pre-R	Pre-Requisite
UEL	University Elective
UM	University Mandatory

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General Introduction

This document explains the curriculum structure for acquiring a Diploma in Renewable Energy Engineering.

The students must complete 60 credit hours (CH) to acquire the Diploma of Renewable Energy Engineering. These credit hours span over university, college, and department requirements as either mandatory or elective courses.

1. General Program Structure

The 60 CH of the Renewable Energy Engineering Diploma program span over university, college, and department requirements as either mandatory or elective courses.

A student can enroll in the Diploma program only when all the foundation requirements in Math and English are met. Otherwise, the student will first enroll in the AU English Language program and/or prerequisite Math courses.

2. Course Information

2.1. Course Code

In this document, a nine characters code is used to identify any course as illustrated in Table 1.

Table 1. Course Code Definition

Degree Type	-	**Major**	**Level**	**Subject**	**Sequence**
Two characters	-	*Four characters*	*1 digit*	*1 digit*	*1 digit*

Where the "Degree Type" defines the nature of the degree under which the course is taken, whether it is technology-based "TE" (for Diploma or Bachelor of Technology programs) or Science-based "SC" (for Bachelor of Science programs). Since the "Degree Type" in this document is always defined as "TE" it will be omitted; the "Major" is one of the codes of Table 2; the "Level" describes the level of the course, which is considered as the year of study during which the student is expected to complete the course; the "Subject" identifies the specialized field of the course. For instance, Table 3 identifies the subject codes for the courses under the Renewable Energy Engineering major. Finally, the "Sequence" is a simple sequence number under a particular level and subject. In this sequence, the numbers 7, 8, and 9 are reserved for lab-based courses.

Table 2. Major Codes

Major	Code
Arts and Humanities	AHUM
Artificial Intelligence Engineering	AIEN
Accounting	BACC
Architectural Engineering	ARCH
Aviation	AVIA
Banking and Finance	BFIN
Biomedical Engineering	BIOM
Chemistry	CHEM
Chemical Engineering	CHEE
Civil Engineering	CIVL
Computer Engineering	COMP
Digital Marketing and Communications	BDMC
Economics	BECO
Electrical Engineering	ELEC
English	ENGL
Events Management	BEVM
General Engineering	ENGI
Geoscience	GEOS
Human Resources	BHRM
International Business & Entrepreneurship	BINT
Management	BMGT
Management Information Systems	BMIS
Maritime	MARI
Marketing	BMKT
Mathematics	MATH
Mechanical Engineering	MECH
Petroleum Engineering	PETR
Physics	PHYS
Renewable Energy Engineering	RENG
Statistics	STAT
Universal	UNIV

Table 3. Subject Codes – Renewable Energy Engineering

Subject Areas in Computer Engineering	Code
Renewable Energy Engineering Fundamentals	0
Solar Energy	1
Hydropower	2
Geothermal Energy	3
Energy Efficiency and Sustainability	4
Environmental and Social Impact	5
Electrical and Power Systems	6
Project	9

2.2. Course Type

In addition to the course code, the letters UM, CM, DM, and UEL indicate the nature of the course as a mandatory or elective course and as to whether it is a university, college, or department requirement. This is detailed as follows:

- UM: University Mandatory Course.
- CM: College Mandatory Course.
- DM: Department Mandatory Course.
- UEL: University Elective Course.

A UM, CM or DM course is a mandatory course that the student must complete as a graduation requirement. On the other hand, UEL are elective courses. For each of these categories is associated a list of elective courses that a student can select from the amount of elective credit hours required by a particular program of study.

2.3. Course Pre-Requisites and Co-Requisites

A number of courses have stated Pre-Requisite (Pre-R) requirements which are prior requirements for entry to the course. Also, some courses have stated Co-Requisite (Co-R) requirements, which are concurrent requirements for entry to the course. A student has the right to complete the Co-Requisite requirements of a particular course prior or during the same semester of study of this course.

Under the list of particular course Pre-Requisites and Co-Requisites, the “or” conditions are spelled out explicitly, whereas the “and” conditions are indicated with a comma “,”. For example: “MATH100, PHYS120” means “MATH100 and PHYS120”.

2.4. Course Credit and Contact Hours

Each course is identified by its credit hours (CH), which is mainly used for the study plan and the calculation of the semester and cumulative Grade Point Average (GPA) of the student. On the other hand, the course contact hours (CoH) identify the weekly contact hours that are required to cover the learning material of the course. This indicates the number of hours that will be in the student semester schedule once they enroll in the course.

3. Diploma of Renewable Energy Engineering

3.1. Program Educational Objectives

The Diploma of Renewable Energy Engineering graduates are able to:

1. Secure successful careers in the field of Renewable Energy Engineering.
2. Apply and develop skills to cope with the current and emerging technologies and the community needs towards innovation and development.
3. Communicate effectively as individuals or in diverse groups to address and solve engineering problems.
4. Troubleshoot and operate different Renewable Energy Engineering systems effectively.
5. Demonstrate principles of soft and technical skills.

3.2. Student Outcomes

Upon completion of the Diploma of Renewable Energy Engineering, the students will be able to:

1. Apply mathematics, science, engineering fundamentals and standard hardware/software tools to solve well-defined problems.
2. Conduct tests and experiments in the practice area and analyze and interpret data.
3. Provide support in performing tasks and procedures and assist in designing engineering systems and components.
4. Understand and apply relevant standards and codes of practice with an emphasis on health and safety aspects in the workplace.
5. Recognize the impact of engineering practice in global, economic, environmental and societal contexts.
6. Apply common communication techniques in well-defined technical and non-technical engineering environments and select appropriate technical literature.
7. Function effectively as individuals and in diverse teams and use a foreign language if applicable.

3.3. Courses Distribution

The Diploma of Renewable Energy Engineering consists of 60 CH distributed over university mandatory and elective courses, college mandatory, as well as department mandatory courses. The corresponding recommended study plan over 4 semesters is detailed in Table 4 where fresh students are required to enroll in a minimum of 15 CH from semester 1 courses.

Table 4. Diploma of Renewable Energy Engineering: Recommended Study Plan

	Course Code	Course Name	Pre-R	Co-R	Credit Hours	Contact Hours	Course Type
Semester 1	ENGL110	Technical Writing for Engineering			3	3	CM
	MATH100	Calculus I			3	3	CM
	PHYS100	Physics I			3	3	CM
	CHEM100	Chemistry I			3	3	CM
	MECH120	Engineering Drawings			1	3	CM
	ENGI100	Introduction to Engineering			1	2	CM
	CHEM109	Chemistry I Lab		CHEM100	1	2	CM
				Semester Total	**15**	**19**	
Semester 2	MATH101	Calculus II	MATH100		3	3	CM
	PHYS101	Physics II	PYHS100		3	3	CM
	ELEC100	Electrical Circuits	MATH100		3	3	DM
	AIEN120	Computer Programming	MATH100		3	3	CM
	MECH100	Workshop I			1	3	CM
	AIEN129	Computer Programming Lab		AIEN120	1	2	CM
	PHYS109	Physics Lab	PHYS100	PHYS101	1	2	CM
				Semester Total	**15**	**19**	
Semester 3	RENG200	Introduction to Energy Systems and Sustainability			3	3	DM
	ELEC200	Electrical Circuits Analysis	MATH101, ELEC100		3	3	DM
	MECH230	Thermodynamics I	PHYS101		3	3	DM
	MECH240	Material Science	CHEM100, CHEM109		3	3	DM
	MECH250	Fluid Mechanics	PHYS101, MATH101		3	3	DM
	ELEC209	Electrical Circuits Analysis Lab		ELEC200	1	2	DM
				Semester Total	**16**	**17**	
Semester 4	RENG210	Applied Photovoltaics	RENG200, ELEC200		3	3	DM
	RENG260	Electronics & Instrumentation in Renewable Energy	ELEC200		3	3	DM
	RENG290	Project 1 (PBL)	ELEC200, RENG200		3	3	DM
	RENG210	Applied Photovoltaics Lab		RENG219	1	2	DM
	RENG269	Electronics & Instrumentation in Renewable Energy Lab		ELEC220	1	2	DM
		University Elective 1 (Table 5)			**3**	**3**	**UEL**
				Semester Total	**14**	**16**	
				Program Total	**60**	**71**	

4. Program Tree

A holistic representation of the Diploma of Renewable Energy Engineering Program is given in Figure 1 in the form of a program tree illustrating graphically all the program's mandatory and elective requirements as well as the pre-requisite and co-requisite requirements.

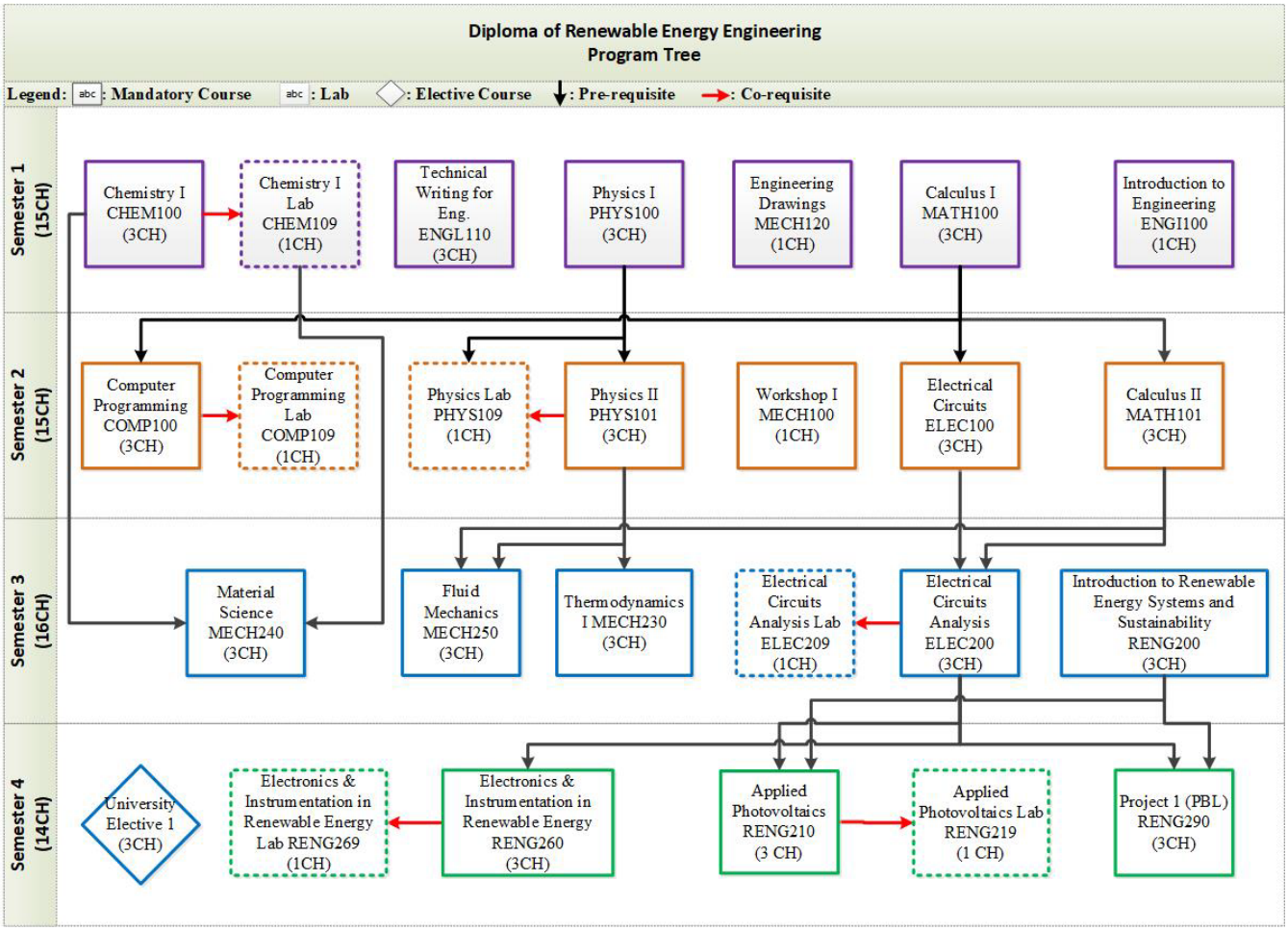

Figure 1. Diploma of Renewable Energy Engineering Program Tree.

5. Elective Courses

During their studies, the Diploma of Renewable Energy Engineering students are obliged to select only one 3CH university elective. The university electives are generally selected from the university-wide elective courses list or from colleges within AU other than the college offering the program followed by the student. Table 5 lists all the university electives offered by AU and the applicability of these courses as university electives for Renewable Energy Engineering Diploma students. The Diploma of Renewable Energy Engineering students select only one of these courses.

Table 5. University Electives

Course Code	Course Name	Credit Hours	Contact Hours	Available for the Program
AHUM100	Arabic Language	3	3	Yes
AHUM101	Science and Society	3	3	Yes
AHUM102	Arab Gulf Society	3	3	Yes
AHUM103	History of Kuwait	3	3	Yes
AHUM104	Human and Environment	3	3	Yes
AHUM105	Introduction to Psychology	3	3	Yes
AHUM106	Philosophy	3	3	Yes
AHUM110	Music	3	3	Yes
AHUM111	Theatre Art	3	3	Yes
AHUM303	Social Organization	3	3	Yes
AHUM304	Social and Cultural Change	3	3	Yes
ARCH101	Interior Design	3	3	Yes
AVIA101	General Principle of Human Factor	3	3	Yes
AVIA130	Basic Aerodynamics	3	3	Yes
AVIA320	Leadership in Organization	3	3	Yes
AVIA332	Non-Destructive Testing Techniques (NDT)	3	3	Yes
BACC110	Financial Accounting	3	3	Yes
BMGT110	Management Principles	3	3	Yes
BMGT350	Business Law	3	3	Yes
BMGT351	International Law	3	3	Yes
BMIS110	Business Computer Applications	3	3	Yes
BMKT120	Branding	3	3	Yes
BMKT121	Advertising	3	3	Yes
BMKT120	Branding	3	3	Yes
BMKT150	Marketing and Technology	3	3	Yes
BMKT160	Sales Strategies	3	3	Yes
ENGL300	Advanced English	3	3	Yes
MATH300	Numbers History and Game Theory	3	3	Yes
STAT200	Probability and Statistics	3	3	No
UNIV110	Entrepreneurship I	3	3	Yes
UNIV310	Entrepreneurship and Enterprise	3	3	Yes

6. University Courses Description

6.1. University Elective Courses

For the description of the university elective courses in Table 5, you may refer to the descriptions provided by the relevant college in AU.

7. College of Engineering Mandatory Courses Description

AIEN120 - Computer Programming (3 CH; 3 CoH; Pre-R: MATH100; Co-R: N/A; CM)

This course covers problem-solving methods and algorithm development using the high-level programming language Python after a brief introduction to computational concepts. Python is a language with a simple syntax and a powerful set of libraries. The course covers basic data types and collections (lists dictionaries tuples and sets) control flow recursion information hiding and encapsulation using classes and objects and introduce the analysis of program performance. The examples and problems used in this course are drawn from diverse areas such as text processing and simple graphics creation.

AIEN129 - Computer Programming Lab (1 CH; 2 CoH; Pre-R: N/A; Co-R: AIEN120; CM)

This lab course provides supplemental material and activities to develop programming skills and enhance the theoretical knowledge of students about programming concepts using the high-level programming language Python. In this Lab, students learn to work with the command line, work with different kinds of data, and participating in several important programming practices (e.g., debugging, testing, and designing programs; read technical documentation and sample code; install and explore third-party modules and APIs).

CHEM100 - Chemistry I (3 CH; 3 CoH; Pre-R: N/A; Co-R: N/A; CM)

A basic understanding of chemistry is of paramount importance to a student considering a career in engineering. Chemistry impacts all of our lives, from the food we eat, the clothes we wear, the burning fuel for heat and transportation, the novel medicines for treatment of deadly diseases, and the impacts of global warming on living organisms. The following topics will be discussed in this course: fundamental aspects of matter and measurements, stoichiometry, electronic structure of atoms, the periodic table properties, chemical bonding, molecular geometry, and the properties of gases and liquids along with intermolecular forces.

CHEM109 - Chemistry I Lab (1 CH; 2 CoH; Pre-R: N/A; Co-R: CHEM100; CM)

This is a laboratory-based course to introduce students to the basic chemistry concepts discussed in the Chemistry I course in a laboratory environment. Students will perform experiments on density, limiting reagent, empirical and molecular formula, acid-base titration, solution preparation, and dilution. This course will also develop students' skills in the research and reporting of laboratory techniques.

ENGI100 – Introduction to Engineering (1 CH ; 2 CoH ; Pre-R: N/A ; Co-R: N/A ; CM)

The Introduction to Engineering course at AU is specifically designed for multidisciplinary engineering students seeking a solid foundation in ethics and its application in engineering practice. The course delves into the ethical considerations and professional responsibilities that engineers encounter throughout their careers. Through the examination of real-world case studies, students develop critical thinking skills and gain an understanding of ethical dilemmas in engineering. The course also introduces engineering practices, emphasizing project management, teamwork,

communication, and problem-solving techniques within an ethical framework. Through interactive discussions and practical exercises, students cultivate a strong understanding of the ethical principles that guide engineering practice and acquire essential skills for ethical decision-making in their future engineering endeavors.

ENGL110 - Technical Writing for Engineering (3 CH; 3 CoH; Pre-R: N/A; Co-R: N/A; CM)

This course is designed to meet the needs of students in the Engineering Departments to research and write extensively. It aims to equip students with the necessary skills and strategies to research and source reliable academic and engineering articles and read these sources to effectively identify and synthesize relevant information and incorporate these ideas in a review report. Within the review report, students will be expected to critically analyze the pertinent issues appropriate to their chosen topic and support their research question while adhering to the academic requirements of text structure, format and referencing.

MATH000 - Pre-Calculus (0 CH; 3 CoH; Pre-R: N/A; Co-R: N/A; CM)

This course is designed for students who do not achieve the required score in the Math placement test. It includes essential training in algebraic operations, solution of equations and inequalities, coordinate geometry, functions and trigonometry. Upon successful completion of this course, students will have adequate competencies and skills to advance to Calculus I.

MATH100 – Calculus I (3 CH; 3 CoH; Pre-R: N/A; Co-R: N/A; CM)

This course covers the fundamental concepts of calculus: limiting behaviors, difference quotients and the derivative, definite integral, antiderivatives and indefinite integrals, and the Fundamental Theorem of Calculus. Students review and extend their knowledge of trigonometry and basic analytic geometry. Important objectives of the calculus sequence are to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations.

MATH101 - Calculus II (3 CH; 3 CoH; Pre-R: MATH100; Co-R: N/A; CM)

This course covers the techniques of integration, applications of the definite integral, improper integrals, an introduction to differential equations, convergence of sequences and series, Taylor series, parametric equations, and polar coordinates. Student should be able to apply and evaluate definite and indefinite integrals; analyze and evaluate limits; understand the definition of improper integrals and compute their values; determine the convergence or divergence of infinite sequences and series; find the Taylor polynomial of order n at a specified center for a function, with error term; identify, differentiate and integrate a power series for a function; analyze curves given in parametric form and in polar coordinates.

MECH100 - Workshop I (1 CH ; 3 CoH ; Pre-R: N/A ; Co-R: N/A ; CM)

This course covers engineering workshop safety, hand tools, and fundamental aspects of different welding techniques. It includes the implementation and practicing of such safety rules and the identification of engineering hand tools and demonstration of their correct use to engineering standards.

MECH120 - Engineering Drawings (1 CH; 3 CoH; Pre-R: N/A; Co-R: N/A; CM)

This course covers demonstration and practice in surface identification and projection techniques, orthographic multi-views projection, missing views, dimensioning, sectioning, axonometric projection, fits and tolerances, instrument drawing and computer-aided applications.

PHYS100 - Physics I (3 CH; 3 CoH; Pre-R: N/A; Co-R: N/A; CM)

This course is the first of a two-semester sequence in Physics. It is an introduction to physics (mechanics) for students who have high school algebra, geometry, and trigonometry at their fingertips, and have had, or are taking Calculus I course. It is designed to develop students' knowledge and understanding of some basic laws and principles of physics and their practical applications to Engineering. Likewise, it includes the following topics: physical units and quantities, vectors, motion in one and two dimensions, circular motion, forces and Newton's laws and their applications, work, force and energy, conservation of energy, linear momentum and collisions, rotational motion, energy and momentum in rotating systems, equilibrium, and oscillatory motion.

PHYS101 - Physics II (3 CH; 3 CoH; Pre-R: PHYS100; Co-R: N/A; CM)

This course seconds the introductory calculus-based Physics I course. In all engineering disciplines, there are fundamental concepts in electromagnetism that constitute the basis of a practicing engineer knowledge. This course will introduce the student to the fundamental concepts needed to analyze simple electrical and electronic systems in a way that at the end of the course, the student will have a fundamental understanding to design and analyze simple electronic systems.

PHYS109 – Physics Lab (1 CH; 2 CoH; Pre-R: PHYS100; Co-R: PHYS101; CM)

This exploratory experimental course in physics is designed for students in all Engineering disciplines to provide hands-on training in the use of some laboratory equipment and techniques to enhance their knowledge in Physics. The focus in this lab-course is to convey useful skills to the students through the application and observation of the concepts and physical laws that are introduced in the lecture. Students will be prepared to perform set of experiments in the laboratory. These experiments emphasize on different topics in mechanics, electricity and magnetism, which are the core aspects of the Physics courses taken by students at the first and second engineering semesters. Specifically, these experiments are a combination of kinematics, dynamics, conservation of energy, ohm's law, RC circuits, as well as electrical currents and potentials. Every lab-session will begin with a short recitation relevant to the experiment's procedures and concepts to ensure the relation between theory and experiments.

8. Department Mandatory Courses Description

ELEC100 - Electrical Circuits (3 CH ; 3 CoH ; Pre-R: MATH100 ; Co-R: N/A ; DM)

This course covers the fundamentals of direct and alternating currents (DC and AC) and the analysis of simple DC and AC series, parallel and series/parallel circuits. Topics to be covered in this course are basic electrical components (Resistors, Capacitors and Inductors), DC/AC voltage and current sources, impedances, admittances, phasors, source transformation, Ohm's and Kirchhoff's Laws.

ELEC200 - Electrical Circuits Analysis (3 CH ; 3 CoH ; Pre-R: MATH101, ELEC100 ; Co-R: N/A ; DM)

This course covers the analysis of DC and AC electrical circuits using techniques such as superposition theorem, mesh and nodal analysis as well as Thevenin and Norton theorems. It also covers AC power, frequency-dependent circuits and DC transients.

ELEC209 - Electrical Circuits Analysis Lab (1 CH ; 2 CoH ; Pre-R: N/A ; Co-R: ELEC200 ; DM)

This course introduces students to the major circuits components and equipment used in a laboratory environment. It develops the skills required to properly implement and troubleshoot DC and AC

circuits. Electrical circuit analysis software used to simulate and troubleshoot complex electrical circuits are also covered.

MECH230 – Thermodynamics I (3 CH; 3 CoH; Pre-R: PHYS101; Co-R: N/A; DM)

The course covers principles of thermodynamics. Basic principles include material properties both extensive and intensive, phase change and relevant phase diagrams, equation of state for ideal and real gases, and tables of properties. It also covers the concept of mass, energy, heat, work, and entropy, and introduces the first and second laws of thermodynamics in addition to the entropy balance and their applications on different thermodynamic systems, such as turbines, pumps and compressors. It further covers the application of energy equation for closed/open and reversible/irreversible systems to understand the energy transfer within these systems.

MECH240 – Material Science (3 CH; 3 CoH; Pre-R: CHEM100, CHEM109; Co-R: N/A; DM)

This course introduces students to the properties of engineering materials, their classifications, and the selection process for given applications. In this course, relationships between material properties and the internal structures of materials, and the processes used to modify these structures and improve the material properties will be explained. Students should be able to analyze failures of materials, explain failure mechanisms, and determine measures to protect against such failures. Students will be able to describe and choose standard methods of testing for given situations, indicate expected results and limitations of each method.

MECH250 – Fluid Mechanics (3 CH; 3 CoH; Pre-R: PHYS101, MATH101; Co-R: N/A; DM)

This course covers the fundamentals of fluid mechanics, including fluid properties and hydrostatic forces on floating and submerged bodies. It also presents methods of analyzing fluid systems and components using the concept of a control volume combined with the conservation of mass, energy, and momentum equations. Students analyze incompressible flows in pipe systems and the Moody diagram, turbine and pumping systems, and jet forces on blades and plates, as well as turbo-machinery in general.

RENG200 – Introduction to Energy Systems and Sustainability (2 CH; 3 CoH; Pre-R: N/A; Co-R: N/A; DM)

This course provides an overview of the fundamental concepts, technologies, and applications of various energy systems, encompassing both renewable and non-renewable sources. Students will explore a wide range of energy sources, including solar, wind, hydropower, bioenergy, geothermal, fossil fuels, and nuclear energy. The course emphasizes the role of these energy systems in meeting global energy demands, their environmental impacts, and the challenges and opportunities associated with transitioning to more sustainable energy practices. Special focus will be placed on the integration of sustainability principles and the importance of balancing energy needs with environmental and societal considerations.

RENG210 – Applied Photovoltaics (3 CH; 3 CoH; Pre-R: RENG200,ELEC200; Co-R: N/A; DM)

This course provides a comprehensive introduction to photovoltaic (PV) technology, with a strong emphasis on the practical application, design, installation, and maintenance of solar energy systems. Students will learn about the fundamental principles of solar energy conversion, PV system components, and different types of solar cells and modules. The course covers key aspects of PV system design, including site assessment, system sizing, electrical configuration, and performance optimization.

RENG219 – Applied Photovoltaics Lab (1 CH; 2 CoH; Pre-R: N/A; Co-R: RENG210; DM)

This lab course provides hands-on experience in the installation, testing, troubleshooting, and maintenance of photovoltaic (PV) systems. Students will work with actual PV modules, inverters, charge controllers, batteries, and other system components to gain practical skills in setting up and optimizing solar energy systems. The lab exercises will cover a range of topics, including measuring solar irradiance, analyzing PV module performance, wiring and connecting PV system components, and conducting system efficiency tests.

RENG260 – Electronics & Instrumentation in Renewable Energy (3 CH; 3 CoH; Pre-R: ELEC200; Co-R: N/A; DM)

This course offers a comprehensive study of electronics and instrumentation with a focus on applications in renewable energy engineering. It covers the characteristics, analysis, and applications of semiconductor devices, including diodes, transistors, field-effect transistors, and operational amplifiers, emphasizing their role in renewable energy systems such as solar and wind power. The course also delves into the principles of instrumentation and measurement techniques, providing insights into process control, signal conditioning, and the use of various measurement devices in renewable energy applications.

RENG269 – Electronics & Instrumentation in Renewable Energy Lab (1 CH; 2 CoH; Pre-R: N/A; Co-R: RENG260; DM)

This lab course provides hands-on experience in the implementation, testing, and troubleshooting of electronic circuits and instrumentation systems used in renewable energy applications. Students will work with diodes, transistors, operational amplifiers, and various measurement devices, simulating and constructing electronic circuits relevant to solar, wind, and other renewable energy technologies.

RENG290 - Project 1 (PBL) (3 CH;3 CoH; Pre-R: ELEC200, RENG200; Co-R: N/A; DM)

This is a project-based learning (PBL) course during which the students work in groups under the supervision of one or more academic staff to Conceive, Design, Implement and Operate (CDIO) a solution to an engineering problem. This course allows students to exercise daily engineering ethics and work practices such as professional documentation, meetings, communication styles, etc. The students are required to present their final solution in the form of technical report, presentation and a functional prototype.

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