Program Viewbook

Bachelor of Science in Power and Renewable Energy Engineering (BScPREE)

Program Description

The Bachelor of Science in Power and Renewable Energy Engineering (BScPREE) program is designed to meet the growing global demand for sustainable and energy efficient solutions. This interdisciplinary program integrates principles of electrical engineering, thermodynamics, and renewable energy systems to prepare students for roles in the energy sector. Through a combination of theoretical coursework, hands-on laboratory experience, and real-world internships, students develop expertise in power generation, energy storage, and smart grid technology. The program emphasizes innovative problem-solving and sustainable design to address the energy challenges of the future.

Graduates of the BScPREE program are well-prepared for diverse careers in both traditional and green energy sectors. They take on roles such as Renewable Energy Engineers, Power Systems Engineers, and Smart Grid Specialists, focusing on the design, optimization, and management of sustainable energy systems. Their expertise includes green energy technologies, energy storage solutions, IoT-based monitoring, and sustainable energy consulting. They also contribute to R&D in renewable and clean energy innovations. Additionally, some pursue entrepreneurship by launching startups in green and renewable energy solutions.

Program Learning Outcomes (PLOs)

PLO 1: Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

PLO 2: Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

PLO 3: Communicate effectively with a range of audiences

PLO 4: Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

PLO 5: Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

PLO 6: Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

PLO 7: Acquire and apply new knowledge as needed, using appropriate learning strategies.

Program Completion Requirements

The Bachelor of Science in Power and Renewable Energy Engineering (BScPREE) degree shall be awarded to a student who is officially enrolled in the program and has fulfilled the following requirements:

- Successful completion of 140 credit hours.
- Achievement of a minimum cumulative GPA of 2.0 on a 4.0 scale.
- Completion of at least 50% of total program credit hours at CUD.
- Completion of the Internship and Graduation Project while enrolled at CUD.

Program Structure

University Requirements Courses	**21 Cr. Hrs.**
Core Courses	**79 Cr. Hrs.**
Major Courses	**40 Cr. Hrs.**
Total	**140 Cr. Hrs.**

List of Courses

I. University Requirement Courses

Course Code		Course Title	Prerequisite	Cr. Hrs.
Compulsory Courses				**18**
LNG	181	English I for Engineering and Computing	None	3
LNG	182	English II for Engineering and Computing	LNG 181	3
GED	190	Emirati Studies	None	3
GED	255	Critical Thinking and Problem Solving	LNG 182 or LNG 172	3
ENT	141	Fundamentals of Innovation and Entrepreneurship 1	None	2
ENT	142	Fundamentals of Innovation and Entrepreneurship 2	ENT 141	1
ENT	241	Entrepreneurship 1	ENT 142	2
ENT	242	Entrepreneurship 2	ENT 241	1
Humanities Elective Courses (03 Credits): Students are required to select one courses from the following courses				
GED	103	Head Anatomy Sculpture	None	3
GED	106	Smart Decisions: Data Literacy and Visualization	None	3
GED	110	Modern Art Appreciation	None	3
GED	111	Music Appreciation and Communication	None	3
GED	191	Islamic Studies	None	3
GED	196	Communication Skills in Arabic 1	None	3
GED	205	Psychology in Everyday Life	LNG 182 or LNG 172	3
GED	324	Ethical Reasoning for Today's World	LNG 182 or LNG 172	3
GED	330	Introduction to Canadian Studies	None	3

II. Core Courses

Course Code		Course Title	Prerequisite	Cr. Hrs.
Compulsory Courses				**79**
MTH	112	Calculus I	None	3
MTH	113	Calculus II	MTH 112	3

Course Code		Course Title	Prerequisite	Cr. Hrs.
MTH	114	Linear Algebra	MTH 112	3
MTH	120	Discrete Mathematics	None	3
MTH	130	Probability and Statistics	MTH 112	3
MTH	212	Calculus III	MTH 113	3
MTH	220	Ordinary Differential Equations	MTH 212	3
SCI	210	Modern Physics	None	3
SCI	220	Engineering Mechanics	None	3
SHS	103	Chemistry	None	3
ENG	102	Digital Logic	None	3
ENG	122	Engineering Graphics and Design	None	1
NET	105	Microprocessors and Microcontrollers	ENG 102 or NET 100	3
ENG	213	Electric Circuit I	SCI 210	3
ENG	222	Engineering Electromagnetics	MTH 212, SCI 210	3
ENG	243	Electric Circuit II	ENG 213	3
ENG	225	Electronics I	ENG 213	3
ENG	312	Electronics II	ENG 225	3
ENG	315	Control Systems	MTH 220	3
ENG	317	Digital Signal Processing	MTH 220	3
ENG	323	Electric Machines	ENG 213	3
ELC	321	Instrumentation and Measurements	ENG 243	3
SWS	110	Programming I	None	3
SWS	111	Programming II	SWS 110	3
BUS	311	Engineering Economy	MTH 130	3
BCS	407	Artificial Intelligence	SWS 111 or BCS 206, BCS 222	3
ENG	416	Professional and Engineering Ethics	Min. 60 Cr. Hrs.	3

III. Major Courses

Course Code		Course Title	Prerequisite	Cr. Hrs.
Compulsory Courses				**37**
DES	320	Design for Sustainability	SCI 220	3
PRE	252	Thermo Dynamics and Fluid Mechanics	SCI 210	3
PRE	361	Power Electronics	ENG 312	3
PRE	362	Solar Energy	DES 320	3
PRE	407	Graduation Project 1	Completed 90 Cr. Hrs.	2
PRE	408	Graduation Project 2	PRE 407	2
PRE	471	Wind Energy	DES 320	3
PRE	472	Electrical Drivers and Convertors	PRE 361	3
PRE	473	Energy Conversion and Storage	PRE 361	3
PRE	474	Power Transmission and Distribution	PRE 361, ENG 323	3
PRE	480	Internship in Power and Renewable Energy	90 Cr. Hrs. & CGPA ≥ 2.0	3
PRE	481	Smart Grids	PRE 474	3
PRE	482	Power Systems Quality	PRE 474	3
Elective Courses (03 Credits): Students are required to select one course from the following courses				
ENG	316	Internet of Things and Data Science	NET 105	3
PRE	486	Digital Control Systems	ENG 315	3
PRE	487	Electromagnetic Compatibility	ENG 222	3

Eight Semesters Study Plan

Semester	Course Code		Course Title	Prerequisite / Co-requisite	Cr. Hrs.
1	LNG	181	English I for Engineering & Computing	None	3
	ENG	102	Digital Logic	None	3
	MTH	112	Calculus I	None	3
	SGS	103	Chemistry	None	3
	SWS	110	Programming I	None	3
	ENT	141	Fundamentals of Innovation and Entrepreneurship 1	None	2
	Total				**17**
2	LNG	182	English II for Engineering & Computing	LNG 181	3
	ENT	142	Fundamentals of Innovation and Entrepreneurship 2	ENT 141	1
	MTH	113	Calculus II	MTH 112	3
	MTH	120	Discrete Mathematics	None	3
	ENG	122	Engineering Graphics and Design	None	1
	SWS	111	Programming II	SWS 110	3
	SCI	210	Modern Physics	None	3
	Total				**17**
3	MTH	130	Probability and Statistics	MTH 112	3
	MTH	212	Calculus III	MTH 113	3
	NET	105	Microprocessors and Microcontrollers	ENG 102 or NET 100	3
	ENG	213	Electric Circuit I	SCI 210	3
	ENT	241	Entrepreneurship 1	ENT 142	2
	SCI	220	Engineering Mechanics	None	3
	Total				**17**
4	MTH	114	Linear Algebra	MTH 112	3
	MTH	220	Ordinary Differential Equations	MTH 212	3
	ENG	225	Electronics I	ENG 213	3
	ENG	243	Electric Circuit II	ENG 213	3
	ENT	242	Entrepreneurship 2	ENT 241	1
	PRE	252	Thermo Dynamics and Fluid Mechanics	SCI 210	3
	Total				**16**
5	GED	XXX	Humanity Elective	None	3
	GED	255	Critical Thinking and Problem-Solving	LNG 182 or LNG 172	3
	ENG	222	Engineering Electromagnetics	MTH 212, SCI 210	3
	ENG	312	Electronics II	ENG 225	3
	ENG	317	Digital Signal Processing	MTH 220	3
	DES	320	Design for Sustainability	SCI 220	3
	Total				**18**
6	BUS	311	Engineering Economy	MTH 130	3
	ENG	315	Control Systems	MTH 220	3
	ENG	323	Electric Machines	ENG 213	3
	ELC	321	Instrumentation and Measurements	ENG 243	3
	PRE	361	Power Electronics	ENG 312	3
	PRE	362	Solar Energy	DES 320	3
	Total				**18**
7	PRE	407	Graduation Project 1	Completed 90 Cr. Hrs.	2
	ENG	416	Professional and Engineering Ethics	Min 60 Cr. Hrs.	3
	PRE	471	Wind Energy	DES 320	3
	PRE	472	Electrical Drivers and Convertors	PRE 361	3
	PRE	473	Energy Conversion and Storage	PRE 361	3
	PRE	474	Power Transmission and Distribution	PRE 361, ENG 323	3
	Total				**17**
8	GED	190	Emirati Studies	None	3
	BCS	407	Artificial Intelligence	SWS 111 or BCS 206, BCS 222	3
	PRE	408	Graduation Project 2	PRE 407	2
	PRE	481	Smart Grids	PRE 474	3
	PRE	482	Power Systems Quality	PRE 474	3
	PRE	XXX	Major Elective 1		3
	Total				**17**
	Internship to be taken after completion of 90 Cr. Hrs. and CGPA 2.0 or more.				3
Total Program Credits					**140**