

# ELECTRICAL ENGINEERING TECHNOLOGY: BACHELOR

## Overview

### Program Mission

The Electrical Engineering Technology program produces highly qualified Electrical Engineers and technicians with state of the art knowledge, technical and leadership skills. The program prepares its graduates to embrace innovation and discovery, strive for lifelong learning, and constantly seek professional development to best serve the Electrical Engineering profession and society.

## Program Description

The Bachelor of Electrical Engineering Technology program provides an excellent broad education with a focused area of specializations options to cater for the global UAE industry. The program graduates are trained to support power generation, transmission, distribution, and control of electric energy systems and related equipment. HCT Electrical engineers are trained to use state of the art software and hardware to rapidly prototype and test potential product design. They gain experience in circuits, semiconductor devices, digital systems, programming, micro-controllers, power systems, industrial instrumentation, and system control. The Bachelor of Electrical Engineering Technology curriculum produces high-quality engineers known for productivity, timeliness, dedication, and competence in the workplace. Graduates have the ability to work logically, accurately and efficiently; to gather and use information effectively; and to continue enhancing their careers through lifelong learning. The program stresses the effective use of technology, information resources and engineering tools.

The program instills leadership qualities based on moral and ethical principles coupled with sound and rational judgment. Finally, the program is designed to prepare interested students for graduate studies in electrical, electronics, communication and control engineering and other areas of professional practice. This program offers elective concentrations in Power Engineering Technology, Communication Engineering Technology, Electronics Engineering Technology and Control and Instrumentation Engineering Technology. Students will have the option to graduate with a Diploma in Electrical Engineering Technology upon the successful completion of 81 credits inclusive of the 8 week Work Placement.

## Program Goals

The Program Educational Objectives of the Bachelor of Electrical Engineering Technology program are to:

1. Provide electrical engineering professionals with the technical knowledge and skills required by the industry to develop, design, and maintain electrical systems to the highest level of industry standards.
2. Prepare graduates for a successful career as effective decision makers with strong communication and teamwork skills and an understanding of global, ethical and social implications of the industry and Electrical Engineering profession.
3. Provide graduates with strong commitment to lifelong learning, continuing education, and professional growth.

4. Provide graduates with leadership qualities and commitment to contribute actively to achieving the Abu Dhabi Vision 2030.

## Program Learning Outcomes

Upon graduation, a HCT graduate in Bachelor of Electrical Engineering Technology should demonstrate:

1. An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the Electrical Engineering Technology.
2. An ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the Electrical Engineering Technology.
3. An ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;
4. An ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes;
5. An ability to function effectively as a member as well as a leader on technical teams.
6. An ability to develop and evaluate a business plan to transform an engineering design (systems, products, services and solutions) into a business opportunity utilizing entrepreneurial skills and knowledge.

## Requirements

### Completion Requirements

Bachelor of Electrical Engineering Technology

Students must successfully complete a minimum of 146 credits, including:

Code	Title	Credit Hours
Program Core Courses		77
Program Elective Courses		15
Mathematics and Science Courses		21
General Studies course		33
<b>Total Credit Hours</b>		<b>146</b>

Code	Title	Credit Hours
<b>Electrical Engineering Core Courses</b>		
Required Credits: 77		
EGN 1133	Design Thinking in Technology	3
EGN 2712	Applied Programming for Engineers	2
EGN 2806	Work Placement I	6
EGN 3012	Project Management	2
EGN 3212	Economics for Engineering	2
EGN 3806	Work Placement II	6
ELE 2114	Electrical Circuits	4
ELE 2181	Circuit Lab	1
ELE 2213	Digital Circuits	3

ELE 2303	Power Generation and Transmission	3
ELE 2314	Principles of Machines and Power	4
ELE 2403	Electronics I	3
ELE 2573	Electric Circuit Design and PCB Manufacturing	3
ELE 2603	Instrumentation and Control	3
ELE 2613	Industrial Automation	3
ELE 2903	Sophomore Design Project	3
ELE 3203	Communication Systems	3
ELE 3213	Engineering Electromagnetics	3
ELE 3323	Electrical Machines	3
ELE 3413	Electronics II	3
ELE 3613	Signals and Systems	3
ELE 3614	Microcontroller Systems	4
ELE 4623	Control Systems	3
ELE 4902	Capstone Design Project I	2
ELE 4912	Capstone Design Project II	2

**Mathematics and Science Required Courses**

Required Credits: 21

CHM 1103	Engineering Chemistry	3
MTH 1103	Pre Calculus	3
MTH 1203	Calculus I	3
MTH 2103	Calculus II	3
MTH 2503	Introduction to Differential Equations	3
MTH 3013	Calculus III	3
PHY 1203	Physics II	3

**General Studies**

Required Credits: 33

**English, Arabic or other Languages**

Required Credits: 12

LSC 1103, AES 1013, AES 1033 and LSC 2193

**Humanities or Art**

Required Credits: 3

AES 1003

**Information Technology and Mathematics**

Required Credits: 6

ICT 2013 and MTH 1113

**The Natural Sciences**

Required Credits: 3

PHY 1103

**The Social or Behavioral Sciences**

Required Credits: 9

LSS 1003, LSS 1123 and BUS 2403

**Concentration Name: Communication Engineering**

Total Credit Hours: 15

Concentration Curriculum:

Code	Title	Credit Hours
ELE 4213	Digital Communication	3
ELE 4223	Data Communication and Network	3
ELE 4653	Digital Signal Processing	3

Concentration Electives:

Code	Title	Credit Hours
Choose 2 Electives		
ELE 4233	Mobile Communications	3
ELE 4243	Satellite Communications	3
ELE 4613	Programmable Devices	3
ELE 4863	Special Topics in Electrical Engineering	3
ELE 4893	Directed Study	3

Concentration Code: COM

**Concentration Name: Control and Instrumentation**

Total Credit Hours: 15

Concentration Curriculum:

Code	Title	Credit Hours
ELE 4423	Embedded System Design	3
ELE 4633	Digital Control Systems	3
ELE 4643	Intelligent Systems	3

Concentration Electives:

Code	Title	Credit Hours
ELE 4393	Machine Control and Drives	3
ELE 4443	Advanced Microprocessors	3
ELE 4613	Programmable Devices	3
ELE 4663	Robotics Technology	3
ELE 4673	Advanced Control Systems	3
ELE 4863	Special Topics in Electrical Engineering	3
ELE 4893	Directed Study	3

Concentration code: ICS

**Concentration Name: Electronics Engineering**

Total Credit Hours: 15

Concentration Curriculum:

Code	Title	Credit Hours
ELE 4423	Embedded System Design	3
ELE 4433	VLSI Design	3
ELE 4653	Digital Signal Processing	3

Concentration Electives:

Code	Title	Credit Hours
ELE 4213	Digital Communication	3
ELE 4233	Mobile Communications	3
ELE 4243	Satellite Communications	3
ELE 4363	Power Electronics	3
ELE 4613	Programmable Devices	3
ELE 4663	Robotics Technology	3
ELE 4863	Special Topics in Electrical Engineering	3
ELE 4893	Directed Study	3

Concentration code: ELS

**Concentration Name: Power Engineering**

Total Credit Hours: 15

Concentration Curriculum:

Code	Title	Credit Hours
ELE 4343	Power System Analysis	3
ELE 4353	System Protection and Coordination	3
ELE 4363	Power Electronics	3

#### Concentration Electives:

Code	Title	Credit Hours
EGN 4333	Renewable Energy Systems	3
ELE 4333	Electrical Power Distribution	3
ELE 4373	Electric Drives	3
ELE 4383	Electrical Maintenance Operation	3
ELE 4633	Digital Control Systems	3
ELE 4643	Intelligent Systems	3
ELE 4863	Special Topics in Electrical Engineering	3
ELE 4893	Directed Study	3

Concentration code: PWR

Description	Data
Total Required Credits	146
Maximum Duration of Study	6 years
Minimum Duration of Study	4 years
Cost Recovery Program	No
Program Code	BELET
Major Code	ELE

## Ideal Study Plan Recommended Sequence of Study

### Year 1

Semester 1		Credit Hours
EGN 1133	Design Thinking in Technology	3
LSC 1103	Professional Communication and Reporting	3
LSS 1003	Life and Future Skills	3
MTH 1103	Pre Calculus	3
PHY 1103	Physics I	3
	Credit Hours	15

### Semester 2

AES 1013	Arabic Communications I	3
AES 1033	Islamic Culture	3
CHM 1103	Engineering Chemistry	3
MTH 1113	Statistics for Engineering	3
MTH 1203	Calculus I	3
PHY 1203	Physics II	3
	Credit Hours	18

### Summer

ELE 2114	Electrical Circuits	4
ELE 2181	Circuit Lab	1
	Credit Hours	5

### Year 2

#### Semester 3

AES 1003	Emirati Studies	3
ELE 2213	Digital Circuits	3
ELE 2403	Electronics I	3
ELE 2603	Instrumentation and Control	3
ICT 2013	Computational Thinking and Coding	3

MTH 2103	Calculus II	3
	Credit Hours	18

### Semester 4

ELE 2303	Power Generation and Transmission	3
ELE 2314	Principles of Machines and Power	4
ELE 2573	Electric Circuit Design and PCB Manufacturing	3
ELE 2613	Industrial Automation	3
ELE 2903	Sophomore Design Project	3
	Credit Hours	16

### Summer

EGN 2806	Work Placement I	6
	Credit Hours	6

### Year 3

#### Semester 5

EGN 2712	Applied Programing for Engineers	2
EGN 3012	Project Management	2
ELE 3413	Electronics II	3
LSS 1123	Basic Research Methods	3
MTH 2503	Introduction to Differential Equations	3
MTH 3013	Calculus III	3
	Credit Hours	16

#### Semester 6

ELE 3203	Communication Systems	3
ELE 3323	Electrical Machines	3
ELE 3613	Signals and Systems	3
ELE 3614	Microcontroller Systems	4
LSC 2193	Applied Skills Capstone	3
	Credit Hours	16

### Summer

EGN 3806	Work Placement II	6
	Credit Hours	6

### Year 4

#### Semester 7

EGN 3212	Economics for Engineering	2
ELE 3213	Engineering Electromagnetics	3
ELE 4623	Control Systems	3
ELE 4902	Capstone Design Project I	2
BUS 2403	Innovation and Entrepreneurship	3
Elective Course		3
	Credit Hours	16

#### Semester 8

ELE 4912	Capstone Design Project II	2
4 Elective Courses		12
	Credit Hours	14
	Total Credit Hours	146

## Faculty and Academic Staff

### Al Ain Men's

Ibrahim Rida, PhD Engineering, Robert Gordon University, UK

### Al Ain Women's

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