

ELECTRICAL ENGINEERING TECHNOLOGY (BELET) : BACHELOR

Overview

Bachelor of Electrical Engineering Technology (BELET)

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

Students seeking the Bachelor of Electrical Engineering Technology degree must successfully complete the following minimum requirements:

1. A minimum of 146 credits, as follows:
 - a. A minimum requirement of 92 credits of the program major as follows:
 - a minimum of 77 core courses including Work Placement for 16 weeks
 - a minimum of 15 credits in the electives of the major
 - b. A minimum requirement of 21 credits of Math and Science courses
 - c. A minimum requirement of 33 credits in General Studies according to the General Studies breakdown and as advised in the study plan of the program.
2. A minimum CGPA of 2.00.

| Code | Title | Credit Hours |
|--|-----------------------------------|--------------|
| Electrical Engineering Core Courses | | |
| 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

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

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 4253 | Tetra 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 4333 | Renewable Energy Systems | 3 |
| ELE 4213 | Digital Communication | 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 |
| Cost Recovery Program | No |
| Minimum Duration of Study | 4 years |
| Program Code | BELET |
| Major Code | ELE |

Ideal Study Plan Recommended Sequence of Study

| Year 1 | | Credit Hours |
|-------------------|--|--------------|
| Semester 1 | | |
| 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 | | |
| LSC 2103 | Academic Reading and Writing II | 3 |
| LSS 1123 | Basic Research Methods | 3 |
| MTH 1113 | Statistics for Engineering | 3 |
| MTH 1203 | Calculus I | 3 |
| PHY 1203 | Physics II | 3 |
| Credit Hours | | 15 |
| Summer | | |
| AES 1013 | Arabic Communications I | 3 |
| CHM 1103 | Engineering Chemistry | 3 |
| Credit Hours | | 6 |

| Year 2 | | Credit Hours |
|--------------------|---|--------------|
| Semester 1 | | |
| AES 1003 | Emirati Studies | 3 |
| ELE 2114 | Electrical Circuits | 4 |
| ELE 2181 | Circuit Lab | 1 |
| ELE 2213 | Digital Circuits | 3 |
| ICT 2013 | Computational Thinking and Coding | 3 |
| MTH 2103 | Calculus II | 3 |
| Credit Hours | | 17 |
| Semester 2 | | |
| ELE 2303 | Power Generation and Transmission | 3 |
| ELE 2314 | Principles of Machines and Power | 4 |
| ELE 2403 | Electronics I | 3 |
| ELE 2603 | Instrumentation and Control | 3 |
| ELE 2903 | Sophomore Design Project | 3 |
| Credit Hours | | 16 |
| Summer | | |
| EGN 2806 | Work Placement I * | 6 |
| ELE 2613 | Industrial Automation | 3 |
| MTH 2503 | Introduction to Differential Equations | 3 |
| Credit Hours | | 12 |
| Year 3 | | |
| Semester 1 | | |
| EGN 2712 | Applied Programming for Engineers | 2 |
| ELE 3213 | Engineering Electromagnetics | 3 |
| ELE 3413 | Electronics II | 3 |
| ELE 3613 | Signals and Systems | 3 |
| MTH 3013 | Calculus III | 3 |
| Credit Hours | | 14 |
| Semester 2 | | |
| EGN 3012 | Project Management | 2 |
| ELE 2573 | Electric Circuit Design and PCB Manufacturing | 3 |
| ELE 3203 | Communication Systems | 3 |
| ELE 3323 | Electrical Machines | 3 |
| ELE 3614 | Microcontroller Systems | 4 |
| Credit Hours | | 15 |
| Summer | | |
| EGN 3806 | Work Placement II | 6 |
| Credit Hours | | 6 |
| Year 4 | | |
| Semester 1 | | |
| EGN 3212 | Economics for Engineering | 2 |
| ELE 4623 | Control Systems | 3 |
| ELE 4902 | Capstone Design Project I | 2 |
| BUS 2403 | Innovation and Entrepreneurship | 3 |
| 2 Elective Courses | | 6 |
| Credit Hours | | 16 |
| Semester 2 | | |
| AES 3003 | Professional Arabic | 3 |
| ELE 4912 | Capstone Design Project II | 2 |
| 3 Elective Courses | | 9 |
| Credit Hours | | 14 |
| Total Credit Hours | | 146 |

*Work Placement I shall start after year 2 Summer Semester is completed.

Faculty and Academic Staff

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