

 **Electrical power Systems Program**

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Program coordinator welcome message

Program tree

Courses description

Resources and laboratories

Students' projects & activities

Industrial Advisory Board

Back to All Programs

 **Image**

* **Overview of the Program**

The Electrical power Systems Program at Future University in Egypt is a five-year, 164 Credit Hours (CH) program consisting of ten semesters. The curriculum includes both compulsory and elective courses, allowing students to tailor their education to their interests. The program incorporates SIX educational modules:

University requirements module of 12 CH, including two English language courses and four humanity courses, two compulsory and two electives.

Faculty requirements module of 32 CH, including: 2 math courses, 2 physics courses, 1 chemistry course, 1 mechanics course, 1 graphics course, and 2 humanity courses.

Department requirements module of 59 CH, including the following areas: electrical circuits, electronics, logic/digital circuits and microcontrollers, electromagnetic fields, signals and systems, measurements, control systems, math, physics, and project management and economics.

Program requirements module of 55 CH, consisting of 45 CH compulsory course in addition to 10 CH elective courses. The compulsory courses cover the following areas: Advanced Computer Programming, Data Structures and Design of Algorithms, Software Engineering, Data Communication, Real-time Embedded Systems, Operating Systems, Database Management Systems, Introduction to Data Security, Artificial and Computational Intelligence, Machine and Deep Learning, Robotics, Digital Image Processing, Computer Vision, Autonomous Vehicles.

The graduation project of 5 CH divided into 2 semesters.

The practical training of 240 training hours divided into 3 training modules each 80 hours, and is counted as 1 CH.

* **Program Mission**

The Faculty of Engineering and Technology at Future University provides an academic and cultural environment that meets international standards, aiming to prepare highly skilled engineers who are professionally and ethically distinguished, entrepreneurial, and aligned with labor market demands. Graduates are equipped to compete locally and regionally, conduct innovative scientific research, and contribute to community service and sustainable development

Achieving leadership at the local, regional, and global levels in engineering education, scientific and applied research, community service, and environmental development.

* **Program Aims**
* PA1. Identify, formulate, and solve complex electrical power engineering problems by applying principles of engineering, science, and mathematics.
* PA2. Apply electrical power 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.
* PA3. Communicate effectively with a range of audiences.
* PA4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of electrical power engineering solutions in global, economic, environmental, and societal contexts.
* PA5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
* PA6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
* PA7. Acquire and apply new knowledge as needed, using appropriate learning strategies.
* PA8. Use techniques, skills and modern engineering tools necessary for electrical power engineering practice.
* PA9. Demonstrate leadership qualities, business administration and entrepreneurial skills.
* PA10. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community.
* **Graduate’ Attributes**
1. Apply mathematical, scientific, and engineering principles to solve engineering challenges, including the selection, modeling, and analysis of electrical power systems with a focus on generation, transmission, and distribution.
2. Design, conduct experiments, and interpret data to model and analyze tailored electrical, electronic, or digital systems or components, enhancing designs with appropriate tools.
3. Develop and implement elements, modules, subsystems, or systems in electrical, electronic, or digital engineering, using professional and technological tools to meet specific application needs within realistic constraints.
4. Evaluate the performance of electrical, electronic, or digital systems and circuits under specific conditions to determine their suitability for designated applications, adhering to both national and international standards and codes for design, construction, operation, inspection, and maintenance.
5. Work effectively within multidisciplinary teams, display professional and ethical responsibilities, and communicate effectively while considering the impacts of engineering solutions on society and the environment.
6. Engage in lifelong learning, demonstrate awareness of contemporary engineering issues, and utilize appropriate techniques, skills, and tools for engineering practice and project management.
7. Use software packages pertaining to electrical power and energy conversion systems; identify the software appropriate for the purpose of simulation, analysis, design, and/or control of a specific application.
8. Investigate the defects and failures of components, systems, and processes based on appropriate fault diagnosis methodology, software tools and/or measuring instruments.
9. Integrate components and sub-systems to build up an assigned system with specific requirements considering compatibility constraints.
* **Career opportunities**

Graduates of the Electrical Power Engineering Program at Future University in Egypt are prepared for careers in a wide range of industries, including:

* Electrical power generation, transmission, and distribution companies
* Electrical equipment manufacturing companies
* Renewable energy companies
* Consulting firms
* Government agencies
* Construction and engineering firms
* Industrial automation and control companies
* Research and development organizations
* Academic and educational institutions
* Non-profit organizations involved in energy and sustainability initiatives
* Oil and gas companies
* Facilities management companies

Graduates of the program can pursue various roles, including electrical engineer, power systems engineer, control engineer, project engineer, research and development engineer, consulting engineer, and more. They may work on designing, testing, installing, operating, and maintaining electrical power systems and equipment, as well as implementing and managing sustainable energy solutions.

* **Students' training and research**

The Practical training is a part of the curriculum of all major programs of the Faculty. The overall duration of the training is 240 hours, divided over three modules (80 training hours each) and should be carried at one or more engineering facilities (inside or outside Egypt). The training program shall be related to the student’s major program and must be approved by the scientific department. The student is eligible to training module after completing a minimum of 54 CH . After completing each module, the student will submit a report and deliver a presentation to be evaluated by the scientific department. The three training modules are equivalent to 1 CH.

* **Under approval new bylaw (144 CH’s)**

The Under-approval new bylaw of The Electrical power Systems Program is a four-year, 144 Credit Hours (CH) program consisting of eight semesters. The curriculum includes both compulsory and elective courses, allowing students to tailor their education to their interests. The program incorporates five educational modules:

* University requirements module of 12 CH, including 6 CH Compulsory course (3 courses) and 6 CH elective course (3 courses)
* Faculty requirements module of 30 CH, including 28 CH Compulsory course (12 courses) and 2 CH elective course (1 course).
* Specialty requirements module of 75 CH, including Compulsory course (25 courses)
* Sub-specialty requirements module of 27 CH, including 12 CH Compulsory course (4 courses) and 15 CH elective course (5 courses)
* The practical training of 150 training hours divided into 2 training modules each 75 hours without credit hours.

It is expected to be enrolled starting from fall 2025.