

Student Guide For The Electronics and Communications Engineering Program



2024/2025



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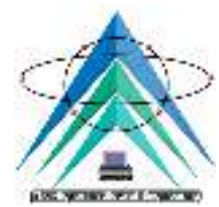
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Ministry of Higher Education and Scientific Research
Higher Institute of Engineering in EL-Shourouk
Communications and Computers Engineering Department
Electronics and Communications Program



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Introduction to the Guide

This guide aims to provide students with essential information and details about the Computer and Control Engineering program. This includes a program overview, its vision, mission, and objectives, as well as unique program features, graduate profiles, and career prospects. Additionally, the guide covers supporting departments and units for the program, and outlines the curriculum for both the 2013 and 2019 syllabi, as per the available academic regulations .

First: Basic information about the program

Name of the institution to which the program is affiliated: Higher Institute of Engineering in EL-Shorouk.

Type of institution: Private higher institute with fees.

Name of the university / academy affiliated to the institution: The institute is affiliated to the Ministry of Higher Education and Scientific Research.

Name of the scientific department to which the program is affiliated: Communications and Computer Engineering

Date of establishment: 1995

Duration of study: Five (5) years

Language of study: English

Geographical location: Cairo Governorate EL- Shorouk City – EL-Nakhil Suburb - P.O. Box 3 - Telephone 19644

Website: www.hie.sha.edu.eg

Second: definition of the program

The Electronics and Communications Engineering program is one of the most prestigious programs in engineering faculties, both locally and regionally, due to the strong and effective impact this specialization has on various aspects of life, as well as its overlap with many other engineering fields such as aerospace engineering, aeronautics, electrical power and energy engineering, biomedical engineering, and other engineering fields.



This program supports two distinct fields: Electronics Engineering and Communications Engineering. The Electronics Engineering field focuses on microelectronics manufacturing, electronic system design, low-power electronics, the applications of electronics in factories, precision sensors, embedded systems, and robotics. The Communications Engineering field includes various wireless communication systems such as mobile communication systems, satellite systems, remote sensing systems, and electromagnetic waves, in addition to computer networks, the internet, and fiber optic networks.

Third: Vision, Mission and Objectives of the Program

(1) Program Vision

Striving for academic and research excellence at the local and regional levels in the field of Electronics and Communications Engineering, with a commitment to supporting sustainable development plans.

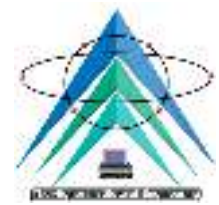
(2) Program Mission

Preparing engineers who are scientifically, professionally, and research-qualified to keep up with developments in the field of Electronics and Communications Engineering, in alignment with the demands of the job market and the enhancement of community services.

(3) Program Objectives

(١-٣) General Objectives of the Program

- 1- Preparing engineers who are scientifically and professionally qualified, with the ability for self-learning, scientific research, and effective communication in the field of Electronics and Communications Engineering and its various applications through:
 - **The educational objectives of the program.**
- 2- Providing an exceptional educational environment for students through:



- Developing the educational program in line with scientific and technological advancements and the demands of the job market.
- Providing distinguished and diverse training opportunities for students at various levels.
- Continuously upgrading laboratories and infrastructure.

3- Continuous qualification and training for faculty members, their assistants, and the administrative staff through:

- Attending training courses at various levels.
- Participating in diverse conferences, seminars, and workshops.

4- Elevating scientific research and community service through::

- Continuously developing the research plan in line with the needs of the job market.
- Contributing to providing diverse support for implementing research and projects to enhance the environment and serve the community.
- Establishing agreements and partnerships with relevant institutions and companies, as well as offering training and consulting services to individuals and community institutions.

(٢-٣)The educational objectives of the program.

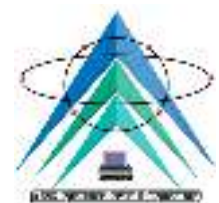
1. Applying basic concepts in fundamental and general engineering sciences, as well as specialized sciences related to the field of Electronics and Communications Engineering.
2. Identifying, analyzing, and solving engineering problems through scientific thinking, as well as employing appropriate techniques, skills, methods, and tools necessary for practicing the engineering profession, with the ability for development and self-learning to meet the needs of the job market.
3. Modeling, designing, implementing, operating, maintaining, and repairing various electronic circuits and systems.



4. Designing and implementing communication systems, networks, microwave systems, and control and measurement systems.
5. Applying knowledge using various programming languages and techniques for signal and image processing and analysis, as well as integrating information technology with modern communication systems.
6. Designing and implementing applied projects and advanced research activities that serve the community and enhance the environment.
7. Exercising good management, making appropriate decisions, effective communication, preparing reports and technical presentations, working within multidisciplinary teams, and adhering to the ethics and standards of the engineering profession.

Fourth: Distinctive Features of the Program.

- 1- The program is distinguished by its historical connection to the institute, as both the institute and the program were established in 1995, granting a Bachelor's degree in engineering after five years of study. Over more than twenty-five years, the Electronics and Communications Engineering program at the Higher Institute of Engineering in El Shorouk has been one of the centers of excellence in engineering education in Egypt, graduating 24 classes with a total of 2,893 engineers by the end of the 2022/2023 academic year.
- 2- Partnerships and agreements with Huawei, including the establishment of a Huawei Academy at the institute, which aids in training students and faculty members on modern technological topics, in addition to linking the curriculum with the job market and providing international exams for students.



- 3- Partnerships and agreements with the Egyptian Space Agency, allowing students to train in space technology and satellite systems, as well as participating with the agency in graduation projects it proposes.
- 4- A research plan for the program that aligns with the national research plan of Egypt.
- 5- Conducting numerous research projects and applied studies to serve the community in collaboration with various state institutions (Military Research Center – Electronics Research Institute – New Cairo Authority – Ain Shams University) to complete these research projects.
- 6- Collaboration with many state institutions for student training and field visits, such as Beni Suef Electronics Industries Company, National Organization for Military Production, Arab Organization for Industrialization, Egyptian Telecommunications Company, Huawei, Egyptian Radio and Television Union, and the Egyptian Space Agency.
- 7- The program features a significant number of faculty members who hold degrees from prestigious universities and distinguished scientific schools.
- 8- Student participation in extracurricular activities by competing in local competitions and achieving advanced positions.
- 9- Existence of student organizations in partnership and cooperation with institutions like the Institute of Electrical and Electronics Engineers (IEEE).
- 10- Availability of a number of international students in the program.
- 11- The program is a specialized professional entity scientifically focused on teaching specialized courses in the field of Electronics and Communications Engineering.

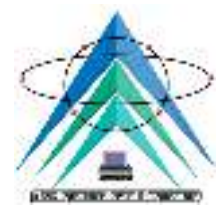
- 12- The program is an interactive entity that operates through students, administrators, and faculty members in a dynamic environment both inside and outside the institute.
- 13- A clear and announced organizational structure that facilitates work organization and integration between the program and the institute's departments and units.
- 14- Continuous development to keep pace with new changes and job market requirements.
- 15- Reliance on technological advancement and communication, utilizing modern teaching and communication methods, contributing to enhancing the efficiency of time management for faculty members, assistants, administrators, and students.

Fifth: Graduate Specifications of the Program.

(5-1) General Specifications for the Graduate

The graduate of the Electronics and Communications Engineering program must be capable of:

1. Master a wide range of engineering knowledge and specialized skills, and be able to apply the acquired knowledge using theories and abstract thinking in real-life situations.
2. Apply analytical and systematic thinking to identify engineering problems in their various forms and degrees of complexity, and provide suitable and innovative solutions.
3. Act professionally and adhere to the ethics and standards of the engineering profession.
4. Lead or work within a diverse team of professionals from various engineering disciplines, demonstrating personal responsibility and teamwork skills.



5. Recognize and distinguish their role in enhancing the engineering field and contributing to the development of the profession and society.
6. Appreciate the importance of both the physical and natural environment, and work to promote sustainability principles.
7. Apply and utilize modern technologies, skills, and tools necessary for practicing the engineering profession.
8. Take full responsibility for self-learning and development, engage in lifelong learning, and demonstrate the ability to participate in graduate and research studies.
9. Communicate effectively using diverse media, tools, and languages with various audiences to address academic and professional challenges in a professional and creative manner.
10. Exhibit leadership qualities, business management skills, and project organization abilities.

(5-2) Specific Specifications for the Graduate

1. Master the application of the technical skills necessary for modeling, designing, implementing, operating, maintaining, and repairing electronic circuits and systems, communication systems, networks, microwave systems, and control and measurement systems.
2. Master the use of various programming languages and integrate information technology with signal and image processing in modern communication systems.

Sixth: Career Fields for Program Graduates.

The field of Electronics and Communications Engineering is broad, with various job opportunities available to graduates, such as:



1. Telecommunications Networks (Site Maintenance Engineer, Testing Engineer, Processing Engineer, Planning Engineer).
2. Networking (Network Engineer, Network Security Engineer).
3. Software Development.
4. Oil, Gas, and Petroleum Companies.
5. Defense and Security Devices.
6. Remote Sensing Agencies and Companies.
7. Aerospace and Aviation.
8. Intelligent Transportation Systems.
9. Fiber Optic Networks.
10. Power Generation, Transmission, and Distribution Stations.
11. Manufacturing Companies of Control Devices and Measurement Equipment.
12. Electrical Panel Manufacturing Companies and Factories.
13. Industrial Control and Automation.
14. Manufacturing and Design of Medical Electrical Devices.
15. Broadcasting and Television.
16. Low Voltage Systems and Building Management.

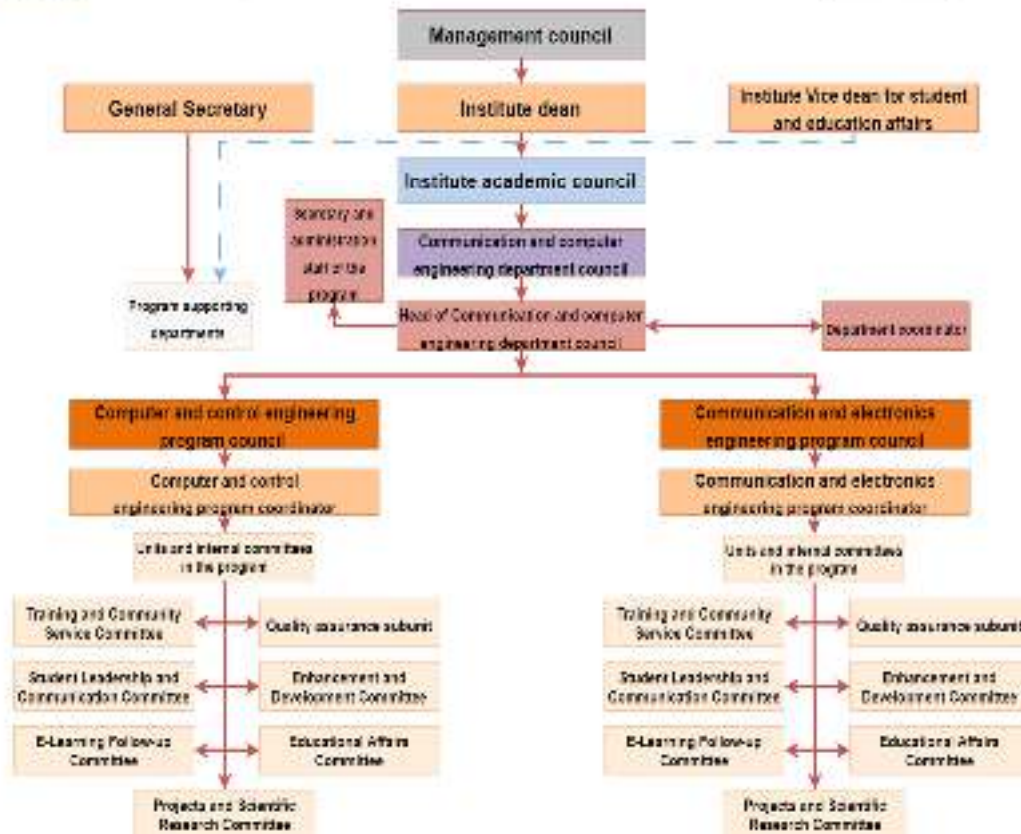
Seventh: Organizational Structure.



**Organizational structure
 of Communication and Computer Engineering department**



Republic of Egypt, Arabic
 Ministry of Higher Education
 The Higher Institute of
 Engineering in EL-Shourouk





Eighth: Definition of the program committees

The program includes seven internal committees as follows:

1- The Enhancement and Development Committee: It is responsible for everything related to the review, enhancement and development of curricula, study regulations and laboratories, as well as the plans and reports of the work of the various committees and other works to achieve the improvement of the level of performance.

2- The Quality Committee: It is responsible for everything related to the quality work in the program and the preparation and processing for the accreditation of the National Authority for Quality Assurance and Accreditation of Education and files of the engineering sector and others, as well as following up and evaluating the level of performance.

3- The Educational Affairs Committee: It is responsible for everything related to the work of educational affairs, from preparing schedules and work of exams and the scientific library and following up the progress of the educational process.

4- The Training and Community Service Committee: It is responsible for everything related to the work and procedures of training, as well as activating cooperation and communication with graduates and community institutions.

5- Student Leadership and Communication Committee: It is responsible for everything related to students, communicating with them, guiding them, following them up and working to overcome any obstacles they face during their study period, and any other work that would provide a distinguished level of services provided to students.

6- E-Learning Follow-up Committee: It is responsible for everything related to the provided electronic services and providing the necessary support to raise the level of electronic services provided.



7- Projects and Scientific Research Committee: It is responsible for everything related to research and applied projects, whether graduation projects for students or others, as well as following up research activity.

Ninth: Departments and units supporting the program

(1) Student Support Unit

▪ **How to announce the unit:**

A. Communication with the Student Union to advertise the unit's services.

▪ **Unit activities**

A- Make special certificates of appreciation for outstanding students and present them in a distinguished ceremony attended by the Chairman of the Board of Directors of the Academy, the Vice Chairman of the Board of Directors of the Academy, the Dean of the Higher Institute of Engineering, the vice dean of the Higher Institute of Engineering, and the heads of departments.

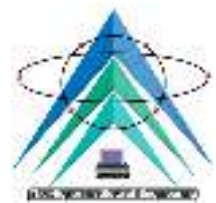
B- Photographing the certificate presentation ceremony for outstanding students to motivate them to study and uploading photos of the celebration on the academy's official website.

C- Conducting make-up lectures for students who recently applied to the institute in the preparatory class in coordination with the Department of Mathematics and Engineering Physics.

D- Conducting make-up lectures for students who have been transferred and are loaded with materials after the issuance of the Clearing Committee's decision in coordination with the Student Affairs Program Department.

E- Providing the necessary moral and social support to students, whether outstanding or struggling.

(2) Education and Student Affairs Department



Supporting student affairs for the program through tuition fee exemptions and the exemption percentage is based on the type of exemption (social - siblings - academic excellence - grants) .

(3) Development and E-Learning Unit

- Preparing students' email and training on the mechanism of use.
- Preparing the e-learning platform (Moodle) with the curricula for faculty members and students to use in the educational process.
- Training students to use the e-learning platform and preparing explanatory videos for that.
- Providing the necessary technical support for students.
- Sending any instructions or correspondence to students.

(4) Scientific Library

- Arranging books and scientific references in the library for easy access by students.
- Providing the necessary loans for books and scientific references in the library for students.
- Purchasing the necessary books and references based on the needs of the courses and the department.
- Making statistics on the average number of students of the program who visit to study and borrow.

(5) Student Care department

- Receiving and welcoming new students.
- Organizing student union elections.
- Holding student activities and participating in various tournaments and competitions.



(6) Examination Management

- Examination preparations including preparing schedules, seating numbers and distributing students.
- Receiving student petitions regarding the grades of the year's work.

(7) Crisis and Disaster Management Unit

- Providing the necessary precautionary measures, especially during the Covid-19 pandemic, in coordination with the institute's administration to limit the spread of the Covid-19 virus.
- Providing procedures and controls that are applied for the safety of workers and students.
- Spreading awareness of safety and security issues through educational seminars and lectures.
- Following up on fire and alarm equipment and devices in buildings and ensuring their safety.
- Following up and reviewing the procedures followed in the event of a fire, God forbid, and reviewing follow up reports on fire extinguishers and alarm devices and their validity.
- Following up cafeterias and visiting them.

(8) Follow-up Department

- Coordination between the program regarding the preparation of study schedules and other programs at the institute, such as providing halls, lecture rooms, etc.
- Following up student attendance on the absence monitoring program and providing reports on student absence rates and notifying them.

(9) Legal Affairs Department



- Settling student disputes by presenting them to the Student Disciplinary Council and imposing appropriate penalties in accordance with the regulations in force in this regard.
- Reviewing the agreements and contracts that are legally implemented, such as the cooperation agreement with the Egyptian Space Agency and the cooperation agreement with Huawei and any other agreements for the benefit of students.

(10) Security Department

- Securing the institute in a way that preserves the safety of all employees, students and facilities.
- Reporting and finding any lost items or financial amounts for students.

(11) Transportation Management

- Providing transportation lines for program employees, including faculty members, support staff, administrative staff, and students.
- Providing any requirements regarding the allocation of cars for the purpose of special missions or errands for the program.

(12) Medical Management

- Providing Covid-19 vaccines for students as part of a cooperation agreement between El- Shorouk Academy and the Ministry of Health and Population.
- Providing medical seminars to raise awareness of Covid-19 and epidemic diseases in coordination with the Crisis and Disaster Management Unit.
- Transferring a number of students to conduct a Covid-19 virus analysis and swab test after the initial symptoms appear on them. Also, transferring students to external hospitals after conducting a medical examination on them.
- Providing medical services and first aid to all students.
- Providing first aid in laboratories and training laboratory specialists on how to use them.



(13) Graduate Affairs Unit

- Preparing, following up, updating and conducting the necessary statistics on graduates' database.
- Preparing a database for institutions and companies related to graduates.
- Documenting communication ties with graduates and relevant institutions by inviting them to scientific and employment forums and any other events that are organized.