Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

Computer and Control Engineering (CCE)

Program Report

2022-2023

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

Content

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

A. Basic Information

1. **Program title:** Computer and Control Engineering (ECE)
2. **Program type:** Single
3. **Department offering the program:** Communication and Computer Engineering
4. **Co-coordinator:** Assoc. Prof. Ahmed Mostafa Elmahalawy
    Dr. Sahar Kamal Hussein
5. **External evaluator:** Prof**.** Osama Elsayed
6. **Year of operation:** 2022-2023

B. Professional Information

1. **Statistics**

- No. of students starting the program (admitted at 2021-2022): 90
- Ratio of students admitted to the program this year (2022-2023) to those of last year (2021-2022):   60:90
- No. and percentage of students passing in each year/level/semester.

Table (1): No. and percentage of students passing in each year/level/semester

Year		Number of students	No of passing Students	Percentage of passing students
Third	2021-2022	90	86	95.56 %
Fourth	2022-2023	88	88	100%

- No. of students completing the program and as a percentage of those who started: 88/90= 97.8%
- Grading: No. and percentage in each grade

Table (2): No. and percentage of students passing in each year/level/semester

Academic year	Number	Percentage
students joining the program on Sept 2021	90	100%
students completing the program at May 2023	83	92.2%
students completing the program at Nov 2023	5	5.56%
Total Number of students completing the program in 2023	88	97.8%

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

Table (3):   Grading: No. and percentage in each grade

Year	Excellent		V. Good		Good		Pass		Failed	
	No.	%	No.	%	No.	%	No.	%	No.	%
4th Year 2022-2023(88)	2	2%	21	24%	44	51%	19	21.59%	0	0%

C. Academic Standards

1. Achievement of program learning outcomes LO's:

Regarding to program matrix of Program Competencies versus courses, we observe the achievement of program learning outcomes to be covered by all courses taught (**Appendix 1 in program specification**).

- **Comments of external evaluator and other stakeholders**

  a- Comments of stakeholders

    The courses of the Computer and Control engineering program are quite sufficient to enhance the skills of the graduates to cope with the job market requirements. However, graduates need to acquire more practical and professional skills. In addition they need to get more presentations skills. (**Appendix 1**)

  b- Comments of external evaluator

    See **Appendix (2) in program specification**.

2. Achievement of program aims

    By reviewing the achievement of program aims covered by the achievement of the different educational aims in the courses, which vary according to the educational purpose of the course we totally observed achievement of program aim which are:

1.   Applying basic engineering sciences, principles of algorithms, and theories of computer science in the modeling and design of computer and control systems.

2.   Analyzing, implementing, modeling, designing, and testing various computer control systems, operating, maintaining, and repairing them, as well as designing and implementing integrated systems, computer-related electronic devices, and modern software systems used in building computer systems.

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

3. Implementing, modeling, and designing database systems, analyzing, and designing computer networks, communication systems, defining specifications and necessary equipment for them, as well as designing websites and mobile applications.

4. Applying the acquired knowledge in the implementation of pattern recognition techniques, signal /image processing and analysis, as well as the design and modeling of various artificial intelligence systems and their control.

5. Apply engineering methods, tools, and skills in the field of computer and control technology to be able to analyze and model engineering problems and choose the optimal solution for them.

6. Developing self-learning skills and focusing on scientific research, effective communication, technical presentations, preparing reports, and providing them with team work ethics.

7. Application and implementation of applied and research projects in response to the needs of society and the development of the environment in accordance with the highest quality standards.

3. Assessment methods

Commentary (quoting evaluations from external evaluator and other stakeholders)

The assessment methods used in the program courses were as following:

1. Written Exams (quizzes, mid-term, and final exam).
2. Practical exams especially for Lab courses.
3. Oral exams for the project, Lab courses and some other courses.
4. Written reports.
5. Presentations and discussions.

The current assessment methods of the program courses are considered quite appropriate due to the number of students enrolled in this program. These methods measure the program competencies (LO's) with reasonable accuracy.

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

4. Student achievement

Graduated Students achievement through the program

Students passing percentage

Year	Percentage
1st Year (2019 - 2020)	96.22%
2nd Year (2020 - 2021)	80.77%
3rd Year (2021 - 2022)	95.56%
4th Year (2022– 2023)	100 %

The percentage of students completing the programs and graduating this year as referred to the admitted students is around 100 % which is considered a good achievement.

The destinations of the program's graduates are, however, not now yet. However, it seems that the market demand nowadays is high for engineers. Most of them are attracted to the privet sector for well payment.

5. Quality of teaching and learning

Comments of external evaluator (appendix 2 in program specification) and other stakeholders (**appendix 4**) including students.

Comments of external evaluator and other stakeholders including students

- Formulation of objectives is clear and some are quantifiable and others qualitatively measurable. There is a matrix showing the relevance of the program's objectives to the graduate specifications.

- Graduate specifications are quantifiable and others qualitatively measurable.

- The Competencies in their entirety are clear and conform to the graduate's specifications and correspond to the scientific development in the field of specialization and the needs of the labor market. There is a matrix of the Program's Competencies with the Program's courses, which shows that the Program's Competencies are verified by the courses. The Competencies were dismantled into learning outcomes and the matrix of compatibility was done.

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

- Academic standards have been prepared to comply with NARS 2018, and the Electronics and Communications Engineering Program's reference academic standards consist of general A-level Competencies, electrical engineering B-level Competencies, and C-level Competencies specializing in electronics engineering and telecommunications. The academic criteria adopted by the program's description are specific and appropriate to the graduate's specifications.

- The structure of the program corresponds significantly to the reference framework for the preparation of bachelor's courses in engineering faculties.

- The methods used in the evaluation are suitable for the nature of the intended learning competencies and learning outcomes.

- Curriculum descriptions include key descriptions: course name, course code, course level, course content, learning outputs, intended Competencies, teaching and learning strategies, learning materials, evaluation methods, teaching hours, university book name, reference names, direct teaching hours and course teacher. However, it was noted in the descriptions of the preparatory team's courses that there was no table showing the relationship of teaching methods with the learning outcomes, and it was noted that the method of writing references in the descriptions of the preparatory team's courses was not uniform in all program courses, and that some of the references mentioned in the descriptions needed a review of the way they were written, in particular the publisher and the year of publication.

- There are reports for the University Year Program and Courses.
  All quality requirements are achieved in the program as well as intended competencies met to graduate a competent engineer and achieve the needs of the labor market.

6. Effectiveness of student support systems
Commentary on both academic and pastoral/personal support for all students

The department is interested in the students' support, despite of the growing numbers of students entering the department through the following:

- Divide the students of the same level into groups and the distribution of the studying schedule to optimize the use of lecture halls, tutorials, laboratories, and drawing rooms.

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

- There is a system of leadership and student communication, whether through the formation of committees for leadership and student communication approved and announced, specialized in presenting and discussing the requirements and suggestions of students, guiding them, and informing them of the developments of the educational process.

- The minutes of leadership and student communication that include the requirements and suggestions of students are presented and discussed to the department council to take the necessary corrective measures in this regard.

- There is a student support unit at the institute, and it has an approved and announced formation and provides many services to students, including the following:

  - Coordination with the leaders of the study teams to identify the problems facing the students.

  - Develop proposals and address students' problems and submit them to Prof. Dr./ Dean of the Institute.

  - Determining the aspects of moral and social support necessary for either outstanding or faltering students.

  - Students' opinion is taken about the order of the courses in the mid- and end-of-semester examination schedules.

- Full support is provided to students in the field of electronic services through the administration of the department and the e-learning development unit at the institute in terms of providing full technical support to students and answering their inquiries in the field of electronic services, in addition to preparing and preparing videos to train students to use the e-learning platform (Moodle) and how to deal with the platform in uploading reports, research and examination performance and follow-up of the scientific content of the courses.

- Students are assisted and encouraged to find cooperation with external bodies such as the Egyptian Space Agency and the Academy of Scientific Research in the field of implementing and supporting graduation projects.

- Training courses and field visits are provided to students at discounted prices to link their courses to the practical aspects of the labor market.

- Provide an email for each student through which instructions and results are sent to students.

- Support students in the case of special circumstances such as cases of the disease,

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

the death of a parent, injuries during an incident, by considering the circumstances of each case in providing the requirements of this year, especially in materials that rely on semester marks and attendance.

7. Learning resources

A. No. and ratio of faculty members and their assistants to students

No. of students 369

No. of program faculty members = 21

No. of program faculty out posted members = 26 (= 13 full time)

Total No. of program members = 21+13 = 34

No. of program faculty member assistants = 16

No. of program faculty members and their assistants = 50

No. of faculty members / No. of students = 34/369 **(1:11)**

No. of faculty members assistants / No. of students = 16/369 **(1:23)**

No. of faculty members and assistants / No. of students =50/369 **(1:8)**

B. Matching of faculty members' specialization to program needs

There are sufficient faculty members in each specialization to satisfy all program needs.

(**Appendix 1 in program specification**)

C. Availability and adequacy of program handbook

There is an updated handbook for all B.Sc. program offered, including study plans and courses' short description, and it is available for students want to join the program.

D. Adequacy of library facilities

The institute library is adequate, due to sufficient number of computers connected to the internet adequate space, adequate lighting, adequate ventilation, computerized search, with enough recent reference's copies.

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

E. Adequacy of laboratories

The department has eleven laboratories

- Digital communication lab.
- Analog communication lab.
- Communication systems lab.
- Software engineering lab.
- Electronic circuit design lab.
- Antennas and waves lab.
- Computer network lab.
- Two Electronics and electrical circuits' lab.
- Projects lab and workshop.
- Circuit printing lab.

There is annual periodic maintenance for all modules and devices in labs.

F. Adequacy of computer facilities

- The available computer labs are adequate compared to the number of students.
- Internet access is available to faculty members in their offices.
- Internet access is available to students through the institute's library, and a wireless network is being installed to cover the building so that they can use the Internet.

G. Adequacy of field/practical training resources

- The regulation includes training courses to cover the required training percentage.
- There is an approved and announced plan for field training to be implemented in cooperation between the department and the training authorities.
- Cooperation agreements were signed with both the Egyptian Space Agency and Huawei, which include the field of training and qualifying students for the labor market.
- The students were trained in many different training Institutions, such as the Egyptian Space Agency, Huawei, Telecom Egypt, and other companies.
- Field visits were carried out for the students, such as a visit to the satellite transmitting and receiving station in Mokattam, affiliated with the Radio and Television Union. And, to the headquarters of the Egyptian Space Agency
- Attachments to this are available at **Appendix 7**.

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

H. Adequacy of any other program needs

None

8. Quality management

A. Availability of regular evaluation and revision system for the program

- There are evaluations and revisions for curriculum. (**Appendix 2 in program specification**)

- Students' questionnaire (**Appendix4**)

- Stakeholders' questionnaire (**Appendix1**)

- Internal evaluation system for the program is set (**Appendix.2 in program specification**)

- Evaluation of exam papers (**Appendix 3**)

- Quality management of the program. (**Appendix 4**)

B. Effectiveness of the system

The quality management system is effective since there are:

- Feedback for the program evaluation.

- Corrective actions for weaknesses in the program.

C. Effectiveness of Faculty and University laws and regulations for progression and completion

- Most of the actions of the last report were applied neatly and were very effective for the system.

D. Availability of regular evaluation and revision system for the program

I- External evaluators

The department program is evaluated by one qualified external evaluator (Prof. Osama Elsayed).

II- Students

The program courses, the teaching methods and the assessment methods are evaluated by the students each semester by questionnaires handed to a percentage of students for each course. As for the alumni there is a questionnaire done to a percentage of them to evaluate the whole program. (**Appendix 4**)

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

III- Other stakeholders

See Appendix 4

All the questionnaires are discussed and used to improve the program as in appendix

E. Faculty response to student and external evaluations

- All the external evaluator's comments were taken in consideration and are stated with the department response in the program specification.
- There is an action plan set to be implemented in the following academic year.

9. Proposals for program development

A. Program structure (units/credit-hours)

The program includes 79 courses of total 320 contact hours (170 credit hours), these courses are classified according to the relevant sector NARS requirements to the following subject areas:

1. Humanities and Social Sciences
2. Mathematics and Basic Sciences
3. Basic Engineering Sciences
4. Applied Engineering and design
5. Computer Application and ICT
6. Projects and Practice
7. Selective Subjects

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

- The following are the subjects taught during this program

Total teaching hours and subjects' distribution over the subject areas

	Course teaching (Contact) hours	Course teaching (Credit) hours	Humanities & Social Sciences	Math & Basic Sciences	Basic Eng.	Applied Eng.& Design	Computer Appl& ICT*	Projects* & Practice	Discretionary
Total Prep year 1st Semester	30	17	3	10	4	-	-	-	-
Total Prep year 2nd Semester	35	17	1	8	6	-	2	-	-
Total 1st year 3rd Semester	28	16	-	5	9	-	2	-	-
Total 1st year 4th Semester	28	16	2	6	4	-	3	1	-
Total 1st year 5th Semester	5	2	-	-	-	-	-	2	-
Total 2nd year 6th Semester	31	17	2	3	6	2	3	1	-
Total 2nd year 7th Semester	27	15	-	2	6	4	3	-	-
Total 2nd year 8th Semester	5	2	-	-	-	-	-	2	-
Total 3rd year 9th Semester	30	17	2	2	2	9	2	-	-
Total 3rd year 10th Semester	31	15	2	-	2	9	2	-	-
Total 3rd year 11th Semester	7	2	-	-	-	-	-	2	-
Total 4th year 12th Semester	32	17	2	-	-	6	-	3	6
Total 4th year 13th Semester	30	17	2	-	-	6	-	3	6
Total of Five Years	320	170	16	36	39	36	17	14	12
% of Five Years	100%		9.40%	21.20%	22.94%	21.18%	10%	8.24%	7.1%
NARS %	**100%**		**9-12%**	**20-26%**	**20-23%**	**20-22%**	**9-11%**	**8-10%**	**6-8%**

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

B. Courses, deletions and additions and modifications

- The program and course specifications, as well as course files, were reviewed by the Internal Audit Committee.

- The report of the Internal Audit Committee and the corrective actions of the Department Council No. 7 for the month of April 2023 was presented and discussed. (**Appendix 2**)

- Avoiding the external evaluator's comments regarding the description and report of the program and courses.

- Linking some of the training courses to the technology of the labor market, and this was activated through the agreements of Huawei and the Egyptian Space Agency.

C. Staff development requirements

- A plan approved by the Academic Council for the development of faculty members and their assistants, through three main axes professional capabilities, scientific capabilities, administrative capacity. According to supporting programs for development of the capabilities of the teaching members and assistants approved form Supreme Council of Universities, and a plan approved by the Academic Council to develop a mechanism for the implementation and evaluation of the adoption of the necessary budget to implement with mechanism for continuous evaluation.

- A plan approved by the Academic Council to encourage the teaching members and assistants by paying a part of the expenses of paper fees under the condition of choosing well known conferences and workshops with high impact factor according to Thomson factor (JCR).

- Training faculty members to use modern methods of teaching in line with the requirements of e-learning.

- Training faculty members on how to deal with the e-learning platform, how to prepare question banks, online exams, and upload scientific content on the e-learning platform (Moodle), in addition to using the Microsoft Teams program to broadcast lectures.

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

- Holding seminars and workshops on program accreditation and its requirements.

- Training a number of faculty members on External Audit in Higher Education Institutions:
  - Assosc. Prof. Ahmed Elmahalawe   - Dr. Emad Abdelaty
  - Dr. Nancy Wadea   - Dr. Saher Kamal

- Training a number of faculty members on credit hour system:
  - Dr. Ahmed Elshafei   - Dr. Mohamed Abdelhamed
  - Dr. Walied Abdelshafy   - Dr. Sameh Fathy

- Training one of the faculty members on leadership skills:
  - Dr. Mohamed Abdelhamed

- Training faculty members and the teaching assistant on the new laboratories that were supplied to the department.

- Training a number of faculty members and the teaching assistant on the Fundamentals of scientific research:
  - Dr.Fathi Nour   - Eng. Amira Elsayed

- Training a number of the teaching assistant on methodology of scientific research:
  - Eng. Eman Samir   - Eng. Hader Mohamed Adel
  - Eng. Mena Allah Nabil   - Eng. Alla Abo Sheasha

- Training a number of the teaching assistant on the Research Scientific Publishing:
  - Eng. Mohamed Magdy   - Eng. Huda Ali
  - Eng. Sama Said   - Eng. Hagar Atif
  - Eng. Alshefaa Atia   - Eng. Aya Moustafa
  - Eng. Eman Mohamed   - Eng. Samar Ahmed
  - Eng. Essra Ahmed   - Eng. Rahma Fathi

Training one of teaching assistants on Interaction Skills. (Eng. Amir Khirt).
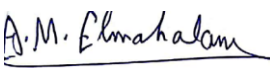
Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

10. Progress of previous year's action plan:

Action	Person	Follow-up	Completion rate%
1. Establishment of a control lab.	Department Council Institute administration	Not yet	0%
2. Increasing the number of modules in communication systems lab. and electronics and electrical circuits lab.	Department Council Institute administration	Not yet	0%
3. Complete the establishment of the graduate database	Department Council Graduate Administration Institute administration	Graduate data base has been updated to include a total of 2914 graduates until now.	100%
4. Increasing the efficiency of computers in computer laboratories.	Department Council Institute administration	Number of memory chips (RAM) and hard disks for computers were purchased at computer engineering lab, electronic circuit design lab and software engineering lab, and 10 screens were purchased for software engineering lab.	100%
5. Renewal of FPGA program license.	Department Council Institute administration	Done	100%
6. Completing the development of the contents of the networking lab (second phase).	Department Council Institute administration	A server and some tools were purchased	100%
7. Training faculty members and the assistant staff on specialized topics to link theoretical studies with market requirements.	Department Council Institute administration	Done	100%

Ministry of Higher Education and Scientific Research
Higher Institute of Engineering, El-Shorouk City
Department of Communication and Computer Engineering
Computer and Control Engineering Program (CCE)

11. Action Plan for Academic year 2023-2024

Action	Person	Completion Date
1. Establishment of a control lab.	Department Council Institute administration	2024/2025-2025/2026
2. Complete the establishment of the graduate database	Department Council Graduate Administration Institute administration	2023/2024
3. Renewal of FPGA program license.	Department Council Institute administration	2023/2024
4. Updating computer screens in Lab 211 C	Department Council Institute administration	2023/2024-2024/2025
5. Buying a server and an OTDR device for the networking lab 102 C	Department Council Institute administration	2023/2024
6. Appointment of new teaching assistants	Department Council Institute administration	2023/2024

In addition to courses action plane for academic year 2023/2024.

Title	Name	Signature
Program Co-coordinator	Dr. Sahar Kamal Hussein	*Sahar Kamal*
Head of program	Assoc. Prof. Ahmed M. Elmahalawy	*A.M. Elmahalawy*
Date of Approval	2022-2023	