



Electronica and communication engineering & technology PROGRAM SPECTIFICATION

2022-2023

PRGRAM COORDINATOR: DR. VIVIAN HANNA



1. Basic Information:

- A. **Program Title:** Electronics and communication engineering & technology
- B. **Program type:** Single
- C. **Departments responsible of the program:**
 - a. Department of Electrical Engineering
- D. **Date of approval of Program specification by the Institute Council:**
Approved on 9/9/2004 .
- E. **Coordinator:** Dr. Vivian Hanna, Head of Electrical Engineering department.
- F. **Year of operation:** 2022/2023
- G. **Date of program regulation approval:**9/9/2004

1.1 External Evaluators:

The most recent program external evaluation has been conducted by: (**Appendix 1**) shows the external evaluators' reports:

External Evaluators	Date of review	Action
Prof. Dr.		All comments were covered

1.2-Professional Information:

1.2.1 Program Mission and Aims

1.2.1.1 Program mission

The mission of Electrical Engineering Department(Electronica and communication engineering & technology) is to provide education that is driven by a professional and technology-oriented focus and highly committed to sustainability. The department is devoted to educating and inspiring future generations of designers who are both technically skilled and ethically professional.



1.2.1.2 Program Aims

The program electronics and communication engineering & technology aims at enriching the Egyptian electronics and communication engineering sector and Society with capable and skilled. The following are the aimed graduate attributes:

1. Preparing distinguished cadres of engineers Demonstrate the scientific principles relevant to the elements and components of Civil & water different systems.
2. Holding scientific conferences to follow up the scientific development in the field of electrical engineering
3. Encouraging faculty members and their assistants to conduct scientific research

1.2.1.3 The attributes of construction engineering & technology program engineers

The graduates of the engineering programs should be able to:

- 1) Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations;
- 2) Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation;
- 3) Behave professionally and adhere to engineering ethics and standards;
- 4) Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance;
- 5) Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community;
- 6) Value the importance of the environment, both physical and natural, and work to promote sustainability principles;
- 7) Use techniques, skills and modern engineering tools necessary for engineering practice;
- 8) Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capacity to engage in post- graduate and research studies;
- 9) Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner;
- 10) Demonstrate leadership qualities, business administration and entrepreneurial skills. Engage in self- and life- long learning.



- 11) Participate in and lead quality improvement projects.
- 12) Manipulate with the electronic circuits, all the way from the discrete components level, circuits' analysis and design, to the troubleshooting with emphasis on electronic power devices.
- 13) Apply control theory and measurement principals for industrial variables, signal conversion, conditioning and processing.
- 14) Deal with the computer's hardware, software, operating systems and interfacing.
- 15) Design, operate and maintain digital and analog communication, mobile communication, coding, and decoding systems.

2. Learning outcomes (LO's) for program

A-General Engineering:

- LO1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
- LO2. Develop and conduct appropriate experimentation and/or simulation, analyze and interpret data, assess and evaluate findings, and use statistical analyses and objective engineering judgment to draw conclusions.
- LO3. Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspects as appropriate to the discipline and within the principles and contexts of sustainable design and development.
- LO4. Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
- LO5. Practice research techniques and methods of investigation as an inherent part of learning.
- LO6. Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.
- LO7. Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.
- LO8. Communicate effectively – graphically, verbally and in writing – with a range of audiences using contemporary tools.
- LO9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
- LO10. Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.

B- Electronics and Communication Engineering

- LO11. Select, model and analyze Electronics and Communication systems applicable to the specific discipline by applying the concepts of: generation, transmission of Electronics and Communication systems.
- LO12. Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
- LO13. Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.



LO14. Estimate and measure the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.

LO15. Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.

3-Academic Standards:

Academic References Standards of the construction engineering & technology program was referenced by the National Academic References Standards (NARS 2009). NARS 2009 was set by National Authority for Quality Assurance and Accreditation of Education in Egypt (<http://naqaae.eg/wp-content/uploads/2014/PDF/21.pdf>). It was enhanced and adopted as academic standards to be suitable for the program (Institute council No. 1) on 8/2003, Program ILOs vs. NARS, Program ILOs vs. Program aims and Program ILOs vs. Program courses association matrices were constructed (Appendices 1 and 2).

4- External Reference Standards and bench marks :

Not present

5-Program Structure and components:

- a. Program duration: **Five academic years.**
- b. Curriculum structure:
 - Credit hours: 300 contact hours
 - Theoretical and practical hours distribution

Theoretical hours:		Tutorial / Lab/ Workshop hours:		Total	300
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- Mandatory and elective credit hours distribution

Mandatory hours:	284	Elective hours:	16	Total	300
Institute	60	Department	240	Total	300

c. Program structure:

		Contact hours	%	NARS %
1	Humanities and Social Sciences	18	0.05	9-12
2	Basics Sciences	29	0.09	20-26



3	Basic Engineering Sciences (Institute/Spec. Req.)	25	0.08	20-23
4	Applied Engineering and Design	370	1.2	20-22
5	Computer Applications and ICT*	20	0.06	9-11
6	Projects* and Practice	8	0.026	8-10
7	Discretionary (Institution character- identifying) subjects	10	0.032	6-8

d. Program Levels:

Study level	Student level	Percentage of the earned credit hours	
		Elective	Mandatory
1	Freshman	0 %	20 %
2	Sophomore	0 %	20 %
3	Junior	0 %	20 %
4	Senior 1	0 %	20 %
5	Senior 2	5.34 %	14.66 %

e. Program courses

e.1 Institute Requirements (General Engineering)

e.2 Program Requirements

First year – General Engineering

الفرقة الأولى – هندسة

عامّة

Total Hrs/week

Total Hrs/week

Total Marks

Course Code	Course Name	First Semester						Second Semester						Total Marks	اسم المقرر
		Hrs/Week		Maximum Marks			Exam Period	Hrs/Week		Maximum Marks			Exam period		
		Lect	Ex./ Lab	Final Exam	Year work	Oral		Lect	Ex./ Lab	Final Exam	Year Work	Oral			
BAS 111	Mathematics (1)	4	2	100	50		3							150	رياضيات (1)
BAS 121	Physics (1)	3	2	90	30	30	3							150	فيزياء (1)
BAS 151	Drawing & Projection Engineering		4	70	30		3							100	الرسم والإسقاط الهندسي
ELE 131	An Introduction to computers & Information	2	3	60	20	20	3							100	مقدمة الحاسبات ومعالجة المعلومات
MEO 141	Production Engineering & Manufacturing	4	2	90	30	30	3							150	هندسة الإنتاج والتصنيع
HUM 171	English Language (1)	2	2	30	20		3							50	لغة إنجليزية (1)
BAS 112	Mathematics (2)							4	2	100	50		3	150	رياضيات (2)
BAS 122	Physics (2)							3	2	90	30	30	3	150	فيزياء (2)
BAS 131	Mechanics							3	2	100	50		3	150	ميكانيكا
BAS 141	Chemistry							2	2	60	20	20	3	100	كيمياء
BAS 152	Engineering Drawing								4	70	30		3	100	الرسم الهندسي
ELE 141	Computer Programming (1)							2	2		60	40	3	100	برمجة الحاسب
HUM 151	Technology & society							2		30	20		2	50	التكنولوجيا والمجتمع
		15	15					16	14					1500	
		30						30							

Second year – Electrical Engineering

الفرقة الثانية – هندسة كهربية

Course Code	Total	First Semester						Second Semester						Total Marks	اسم المقرر
		Hrs/Week		Maximum Marks			Exam Period	Hrs/Week		Maximum Marks			Exam period		
		Lect	Ex./ Lab	Final Exam	Year work	Oral		Lect	Ex./ Lab	Final Exam	Year Work	Oral			
BAS 211	Mathematics (3)	4	2	100	50		3							150	رياضيات (3)
BAS 221	Physics (3)	4	2	90	30	30	3							150	فيزياء (3)
ELE 211	Electric Circuits	4	3	90	30	30	3							150	دوائر كهربية
ELE 212	Electrical Power Engineering	3	2	70	30		3							100	هندسة قوى كهربية
ELE 241	Computer Programming (2)	2	2		100	50	3							150	برمجة الحاسب (2)
HUM 211	English Language (2)	2		30	20		2							50	لغة إنجليزية (2)
BAS 212	Mathematics (4)							4	2	100	50		3	150	رياضيات (4)
BAS 222	Physics (4)	19	11					4	2	100	50		3	150	فيزياء (4)
ELE 221	Electronic Circuits	30						4	2	90	30	30	3	150	دوائر الكترونية
ELE 222	Computer-Aided Circuit Analysis & Sch							2	3		70	30	3	100	برمجيات رسم وتحليل الدوائر
ELE 231	Logical Design							3	2	90	30	30	3	150	تصميم منطقي
HUM 221	Industrial Psychology							2		30	20		2	50	علم النفس الصناعي
		19	11					19	11					1500	
		30						30							



Third year – Electrical Engineering- Electronics and Communication

الفرقة الثالثة – هندسة كهربائية – هندسة كهربية – هندسة وتكنولوجيا الإلكترونيات والاتصالات

Course Code	Course Name	First Semester						Second Semester						Total Marks	اسم المقرر
		Hrs/Week		Maximum Marks			Exam Period	Hrs/Week		Maximum Marks			Exam period		
		Lect	Ex./ Lab	Final Exam	Year work	Oral		Lect	Ex/ Lab	Final Exam	Year Work	Oral			
BAS 311	Mathematics (5)	3	2	100	50		3							150	رياضيات (5)
ELE 311	Electrical Measurements	3	1	60	20	20	3							100	قياسات كهربائية
ELE 321	Electronics (1)	19	11	90	30	30	3	18	12					150	الإلكترونيات (1)
ELE 322	Electronic Analog Circuits	2	3	90	30	30	3	30						100	دوائر إلكترونية تناظرية
ELE 324	Electronic Digital Circuit(1)	3	2	60	20	20	3							150	دوائر إلكترونية رقمية(1)
ELE 351	Communication(1)	2	2	90	30	30	3							100	اتصالات(1)
HUM 311	English Language (3)			30	20		2							50	لغة إنجليزية(3)
ELE 323	Electronics(2)							4	2	90	30	30	3	150	الإلكترونيات(2)
ELE 325	Electronic Digital Circuits(2)							2	3	60	20	20	3	150	دوائر الإلكترونيات رقمية(2)
ELE 352	Communication (2)							4	2	90	30	30	3	150	اتصالات (2)
ELE 361	Automatic control							4	4	90	30	30	3	100	تحكم آلي
MEC 311	Mechanical Engineering							2	1	20	15	30	3	100	هندسة ميكانيكية
HUM 331	Industrial Organization							2		30	20	15	2	100	تنظيم صناعي

Total

Total

Total

1500

Fourth year – Electrical Engineering- Electronics and Communication

	Course Name	First Semester						Second Semester						Total Marks	اسم المقرر
		Hrs/Week		Maximum Marks			Exam Period	Hrs/Week		Maximum Marks			Exam period		
		Lect	Ex./ Lab	Final Exam	Year work	Oral		Lect	Ex/ Lab	Final Exam	Year Work	Oral			
ELE 411	Fields Theory	3	1	70	30		3							100	نظريه مجالات
ELE 421	Electronics(3)	4	2	90	30	30	3							150	الإلكترونيات(3)
ELE 422	Electronics Measurements(1)	2	3	60	20	20	3							100	قياسات الإلكترونيات(1)
ELE 431	Microprocessor & Applications	3	1	60	20	20	3							100	المعالج الدقيق وتطبيقاته
ELE 451	Communication Systems	3	2	60	20	20	3							100	نظم الاتصالات



ELE 471	Signal Processing	2	2	60	20	20	2							100	معالجة الاشارات
HUM 431	Projects Management	2		30	20		3							50	إدارة المشروعات
ELE 423	Electronic(4)							4	2	90	30	30	3	150	الالكترونيات(4)
ELE 424	Electronic Measurements(2)							2	1	60	20	20	3	100	قياسات الكتروني(2)
ELE 425	Digital Integrated Circuit Design							3	1	60	20	20	3	100	تصميم الدوائر الرقمية
ELE 432	System& Networks							3	1	70	30		3	100	النظم والشبكات
ELE 452	Microwave Circuits							4	1	90	30	30	3	150	دوائر الموجات الدقيقة
ELE 462	Digital Control System							4	2	90	30	30	2	150	نظم التحكم الرقمية
HUM 441	Engineering Economics &Laws							2		30	20		3	50	اقتصاديات وتشريعات هندسيه

الفرقة الرابعة – هندسة كهربية – هندسة وتكنولوجيا الإلكترونيات والاتصالات

Fifth year – Electrical Engineering- Electronics and Communication

Total	19	11	30	Total	22	8	30	Total	1500
الفرقة الخامسة – هندسة				كهربية – هندسة وتكنولوجيا				الإلكترونيات والاتصالات	

Course Code	Course Name	First Semester						Second Semester					Total Marks	اسم المقرر	
		Hrs/Week		Maximum Marks			Exam Period	Hrs/Week		Maximum Marks					Exam period
		Lect	Ex./ Lab	Final Exam	Year work	Oral		Lect	Ex/ Lab	Final Exam	Year Work	Oral			
ELE 591	Project	2	4					2	6				300	300	المشروع
ELE 521	Electronic(5)	3	1	60	20	20	3							100	الالكترونيات (5)
ELE 522	Analog Integrated Circuit Design	4	2	90	30	30	3							100	تصميم الدوائر المتكاملة التناظرية
ELE 551	Optical Communications	4	2	90	30	20	3							100	اتصالات ضوئية
ELE 5x1	Elective Course(1)	3	1	70	30		3							100	مقرر اختياري(1)
ELE 5x2	Elective Course(2)	3	1	70	30		3							100	مقرر اختياري (2)
ELE 524	Application Specific Integrated Circuits							4	3	120	40	40	3	200	الدوائر المتكاملة للتطبيقات الخاصة
ELE 525	Integrated Circuits Testing Design							4	3	120	40	40	3	200	الدوائر المتكاملة التناظرية
ELE 5x3	Elective Course (3)							4	1	70	30		3	100	مقرر اختياري (3)
ELE 5x4	Elective Course (4)							2	2	70	30		3	100	مقرر اختياري (4)
Total		19	11					16	14					30	1500

المقررات الاختيارية للفصل الدراسي الاول 1st Semester Elective Course

ELE 523	Integrated circuit technology	تكنولوجيا الدوائر المتكاملة
ELE 532	Computer interface circuit design	تصميم الدوائر الموائمة للحاسبات
ELE 552	Telephone communication systems	أنظمة الاتصالات التلفونية
ELE 581	Industrial electronics	الإلكترونيات الصناعية

المقررات الاختيارية للفصل الدراسي الثاني 2nd Semester Elective Course

ELE 526	TV & Video Systems	أنظمة التلفزيون والفيديو
ELE 527	Computer Aided Electronic Design & Manufacture	التصميم الإلكتروني والتصنيع بمساعدة الحاسب
ELE 553	Advanced Communication System & Networks	نظم الاتصالات والشبكات المتقدمة
ELE 572	Analog Artificial Neural Networks	الشبكات العصبية الاصطناعية التناظرية



e.3. Elective courses

1st Semester Elective Course المقررات الاختيارية للفصل الدراسي الاول

CIV 513	Computer Analysis of Structures	تحليل منشآت بالحاسب الالى
CIV 514	Wall Bearing Structure	المنشآت ذات الحوائط الحاملة
CIV 515	Reinforced Concrete Shell Roofs	أسقف الخرسانة المسلحة القشرية
CIV 521	Quality Control & Assurance	ضبط الجودة والتأكد
CIV 522	Inspection & Non Distractive Testing	الفحص والاختبارات غير المتلفة
CIV 532	Ground Improvement	تحسين التربة
CIV 543	In site testing & Construction Technologies of foundation	تكنولوجيا الصب والتشييد في الاساسات

2nd Semester Elective Course المقررات الاختيارية للفصل الدراسي

CIV 516	Reliability & fire safety of R.C Structures	الامان ضد الحريق في المنشآت الخرسانية
CIV 517	High Rise Building & R.C Towers	المباني العالية والأبراج الخرسانية
CIV 533	Tunnels & Unground Structures	الانفاق والمنشآت تحت الارض
CIV 551	Construction Technology of Highway and Airports	تكنولوجيا انشاء الطرق والمطارات
CIV 561	Photogrammetry & Remote Sensing	الاستشعار عن بعد وتطبيقاته
CIV 562	Geographic Information System GIS	نظم المعلومات الجغرافية

Contact Hours

Total contact hours 360

f. Courses Contents:

As mentioned in courses specifications and bylaw.



6. Program Admission Requirements

- a. Secondary Egyptian Schools Graduates.
- b. Secondary School Certificate Graduates of other countries are eligible to join this program if they met the minimum grades set by Admission Office of the Ministry of Higher Education.
- c. The study begins with a preparatory year for all students before specialization in Civil Engineering. Students' departmental allocation is in accordance with the institute Council regulations.

4. Graduation requirements (Completion of program):

- a- The student is considered successful if he passes the examinations in all courses of his class.
- b- The student is promoted to the next higher level if he fails in not more than two subjects of his class or from lower classes,
- c- In addition to the two subjects mentioned in the previous item, the student who fails in two subjects in humanities and social sciences, whether from his class or from lower classes, is admitted to the transfer to the consecutive higher level. Passing successfully in all courses before obtaining the B.Sc. degree is a prerequisite.
- d- The referred student has to sit the examination in the courses in which he has failed together with the students studying the same courses. The student gets a pass grade when he passes the examination successfully. In case the student was considered absent with acceptable excuse in a course, he gets the actual grade
- f- The grades of the successful student in a course and in the general grade are evaluated as follows:
 1. Distinction: from 85% of the total mark and upwards
 2. . Very good: from 75% to less than 85% of the total mark.
 3. Good from: 65% to less than 75% of the total mark
 4. Pass: from: 50% to less than 65% of the total mark



g- The grades of a failing student in a course are estimated in one of the following grades: Weak: from 30% to less than 50% of the total mark Very weak: less than 30% of the total mark.

h- The B.Sc. general grade for students is based on the cumulative marks obtained during all the years of study. The students are then arranged serially according to their cumulative sum

i - The student is awarded an honor degree in his cumulative sum is distinction or very good provided that he gets a grade not less than very good in any class of study other than the preparatory year. Moreover, he should have not failed in any examination he has sat in any class other than the preparatory year.

8- Graduation Minimum contact Hours Required

The minimum number of credit hours required for graduation as specified in the bylaw is 300 contact hours.

9- Academic degree Requirements

The curriculum of all academic programs in the institute includes the following group of courses:

(a) institute requirements (Mandatory general engineering): Is a group of 60 contact hours courses to develop the personality of students. They must be completed by all students as part of the graduation requirements for the chosen field of specialization.

(b) Program requirements (Mandatory Civil engineering): are 224 contact hours group courses to develop the specialty of students according to Civil Engineering discipline

(b) Program requirements (Elective Civil engineering): are 16 contact hours group courses to develop the specialty of students according to Civil Engineering discipline .

10-Student Assessment (Methods and rules for student assessment)

Intended Learning Outcomes	Assessment methods								
	Written exam	Online exam	Oral Exam	Mid Term Exam	Attendance	Project	Report and sheet	Laboratory exam	Quiz
A-Knowledge and Understanding	√	√	√	√		√	√	√	√
B- Intellectual Skills	√	√	√	√		√	√	√	√



C-Practical and Professional Skills	√	√	√	√		√	√	√	√
D-General and Transferable Skills			√		√	√	√		

11. Program Evaluation Methods:

	Evaluator	Method	Sample
1	Senior Students	Questionnaire and brain storming	40 %
2	Alumni	Questionnaire	20 -30
3	Stakeholders	Questionnaire, meetings and discussions	Representative sample
4	External evaluator	Provide reports after site visit and document examination	1
5	Internal evaluators for courses	Provide reports after document examination	1

Program Coordinator and

Institute Dean

Assoc.Prof. Dr. Tamer Elgohary

Prof. Dr. Esam Khalifa

Signature:

Signature:

Date: 1/ 9/2021

Prepared concerning NAQAAE form No. 13