International Academy for Engineering and Media Science

Engineering Division

Communications and Electronics Engineering Department

Program Specification

For

Communications and Electronics Engineering Program

Bylaw2012

Program Specification

International Academy for Engineering and Media Science

Engineering Division

A-Basic Information

1	**Program title**	:	Communications and Electronics Engineering
2	**Program type**	:	Single
3	**Department**	:	Communications and Electronics Engineering
4	**Program coordinator**	:	Dr. Ehab ElRafai
5	**External Evaluators**	:	Prof. Dr. EL-Sayed Mahmoud Abdel-Hamid El-Rabeay
6	**Internal Evaluators**	:	Prof. Dr. Said Mohamed El-Halafawy
7	**Date of program Bylaw approval:**		Ministerial decision No. 4266 dated 17/9/2012
8	**Date of program specification approval :**		10/2021

B-Professional Information

1. Communications and Electronics Electrical Engineering Program Mission

In the Framework of the Media Engineering Division Mission of the International Academy of Engineering and Media Science, the Communications and Electrical Electronics Engineering program contributes in preparing distinguished graduates capable of innovation and development, competition and scientific research, which meets the needs of the labor market locally and regionally and keep up technological, and applied techniques according to the national academic reference standards to meet the goals of sustainable development within a framework of societal and ethical values.

2. Program Amis

The graduate from Communications and Electrical Electronics Program will be able to:

Obj1. Employ the knowledge of the principles of mathematical and engineering sciences to identify, formulate, and solve real communication and electrical electronics engineering problems in a systematic scientific thinking manner.

Obj2. Participate in the development of society by creating a strong relationship with the local and regional industry.
Obj3. Communicate effectively and work in a multidisciplinary team of engineers and technicians in different specialties, and display professional leadership, business administration, ethical responsibility and entrepreneurial skills.
Obj4. Master self- and long-life learning strategies using various techniques, languages, and software through participation in communications and electrical electronics engineering projects.
Obj5. Demonstrate creative and effective research to develop, promote, and face the challenges in the contemporary engineering issues with high quality and technical excellency.
Obj6. Design and conduct experiments using computer-aided tools and available simulation software to solve problems in Electrical communication systems, as well as ability to formulate, analyze and interpret results through preparing technical reports.
Obj7. Design, operate and maintain digital and analog communication, mobile communication, satellite communication, microwave systems, signal processing systems, coding, and decoding systems.
Obj8. Deal with electronic circuits, from discrete component level, circuit analysis and design, to troubleshooting with a focus on electronic circuits and devices.
Obj9. Apply the new emerging techniques in the design, management, and maintenance of computer networks, wireless communication, Antennas, optical communication and digital signal processing systems.

3. Graduate Attributes of Communications and Electronics Electrical Program

The Communications and Electrical Electronics Engineering program aims for preparing distinguished and capable graduates with skills of scientific research, and development, which satisfies labor market requirements at the local and international levels while keep framework of societal and ethical values.

The graduate of Communications and Electrical Electronics Engineering program will be able to:

GA1. Master a wide spectrum of engineering knowledge and specialized skills and can apply acquired knowledge using theories and abstract thinking in real life situations.
GA2. Apply analytic critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variation.

GA3. Behave professionally and adhere to engineering ethics and standards.

GA4. Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.

GA5. Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community.

GA6. Value the importance of the environment, both physical and natural, and work to promote sustainability principles.

GA7. Use techniques, skills, and modern engineering tools necessary for engineering practice.

GA8. 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.

GA9. Communicate effectively using different modes, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.

GA10. Demonstrate leadership qualities, business administration and entrepreneurial skills.

GA11. Understand and adopt the new technologies in design, management, and maintenance networks, wireless and mobile communications, antennas, microwave systems, optical communication and digital signal processing systems.

GA12. Apply the principles of mathematical and engineering sciences to identify, formulate, and solve real electronics and electrical communication engineering problems in a systematic scientific thinking with a wide range of complexity and variation.

GA13. Manage projects related to electrical communication systems in wide range of applications subjected to industrial, economic, environmental, and social developments.

GA14. Implement and integrate the new technologies of electronic and electrical communication systems for emerging engineering applications.

4. Relationship of Graduate Attributes with Program Aims

Table (1) shows the relationship between the program aims and graduate attributes.

Table (1): The Relationship between Program Aims and Graduate Attributes

		Graduate Attribute 1	Graduate Attribute 2	Graduate Attribute 3	Graduate Attribute 4	Graduate Attribute 5	Graduate Attribute 6	Graduate Attribute 7	Graduate Attribute 8	Graduate Attribute 9	Graduate Attribute 10	Graduate Attribute 11	Graduate Attribute 12	Graduate Attribute 13	Graduate Attribute 14
Program Aims	Program Aim #1	*						*							
	Program Aim #2		*					*							
	Program Aim #3			*	*				*	*	*				
	Program Aim #4			*		*			*						
	Program Aim #5						*							*	
	Program Aim #6										*			*	*
	Program Aim #7											*		*	*
	Program Aim #8												*		*
	Program Aim #9											*	*		

5. The Academic Reference for the Program

In the Framework of the National Academic Reference Standards for the Engineering Sector 2018 (NARS 2018), the program competencies are classified into three levels:

- Level A: This level reflects the general competencies that any graduate from the College of Engineering should have gained.
- Level B: This level reflects the general specialized competencies that any graduate in the field of electrical engineering should possess.
- Level C: This level reflects the specialized competencies that a graduate of the communication and electronics electrical engineering program should acquire.

5.1 Competencies of Engineering Graduate (Level A)

The Engineering Graduate must be able to:

A1.	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
A2.	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.
A3.	Apply engineering design processes to produce cost-effective solutions that meet specified needs with consideration for global, cultural, social, economic, environmental, ethical and other aspect appropriate to the discipline and within the principles and contexts of sustainable design and development.
A4.	Utilize contemporary technologies, codes of practice and standards, quality guide lines, health and safety requirements, environmental issues and risk management principles.
A5.	Practice research techniques and methods of investigation as an inherent part of learning.
A6.	Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.
A7.	Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.

A8.	Communicate effectively–graphically, verbally and in writing–with arrange of audiences using contemporary tools.
A9.	Use creative, innovative and flexible thinking and acquirement repreneurial and leader ship skills to anticipate and respond to new situations.
A10.	Acquire and apply new knowledge; and practice self, life long and other learning strategies.

5.2 Competencies of Electrical Engineering Graduate (Level B)

In addition to the Competencies for All Engineering Programs the basic Electrical Engineering graduate must be able to:

B1.	Select, model and analyze electrical power systems applicable to the specific discipline by applying the concepts of :generation, transmission and distribution of electrical power systems.
B2.	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
B3.	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
B4.	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.
B5.	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.

5.3 Competencies of Communications and Electronics Electrical Engineering Graduate (Level C)

In addition to the competences for all Engineering Programs (A-Level) and the competencies for the Electrical Engineering Discipline (B-Level), the Communications and Electronics Electrical Engineering Program graduate must be able to:

C1. Understand the underlying physical phenomena and performance limitations of various electronic and electrical communication systems; synthesize different electronic and electrical communication systems, measure their performance using the appropriate lab equipment and analyze the obtained results using mathematical methods.
C2. Demonstrate the knowledge about state-of-the-art designs of components and systems; and develop innovative solutions for practical industrial problems in electronics and electrical communications engineering.
C3. Design, analyze and measure the performance of communication systems: wireless and wired networks, encoding and decoding systems; microwave systems with identifying software tools and mathematical methods required to optimize their performance.
C4. Implement and integrate electronic and electrical communication systems for different engineering applications.

6. Benchmarks and Academic Reference Standards

The external references for standards considered in the development of this program were the National Academic Reference Standards for Engineering (NARS2018) and for Electrical Engineering graduate.

7. The Academic Reference and ProgramAims

Table (2) explain show the competencies of the current program achieve the program aims:

Table (2): The Relation Between Program Aims and Academic Reference

		Academic Reference																	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3	C4
Program Aims	Program Aim #1	*	*																	
	Program Aim #2	*								*							*			
	Program Aim #3						*	*	*											
	Program Aim #4					*					*								*	
	Program Aim #5				*									*						*
	Program Aim #6			*									*	*		*				
	Program Aim #7											*						*		*
	Program Aim #8														*				*	
	Program Aim #9												*	*		*		*		

8. Learning Outcomes:

The program learning outcomes are divided into three domains cognitive, psychomotor and affective:

1. Cognitive Domain:

A1.1	Identify and formulate complex engineering problems by applying engineering fundamentals, basic science and mathematics.
A2.1	Analyze and interpret data, assess and evaluate findings to draw conclusions
A3.1	Formulate a design process to meet specified needs.
A4.1	Identify technologies, codes of practice and standards related to the discipline.
A5.1	Investigate research techniques and methods of investigation.
A6.1	Plan the implementation of engineering projects taking into consideration other trades requirements.
A7.1	Identify his/her role as an individual and as a member of multi-disciplinary and multi-cultural teams.
A8.1	Recognize methods of communications (verbally/written) with a range of audiences using contemporary tools.
A9.1	Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations
A10.1	Acquire new knowledge using and self-practice lifelong and other learning strategies.
B1.1	Choose and analyze electrical power systems applicable to the specific discipline by applying the concepts of: generation, transmission and distribution of electrical power systems.
B2.1	Design and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
B3.1	Design elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
B4.1	Estimate the performance of an electrical/electronic/digital system and circuit under specific input excitation, and evaluate its suitability for a specific application.
B5.1	Choose suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.
C1.1	Define/Identify/Explain the underlying physical phenomena and performance limitations of various electronic and electrical communication systems.
C2.1	Demonstrate the knowledge about state-of-the-art designs of components and systems; and identify industrial problems in electronics and electrical communications engineering.
C3.1	Estimate the performance of communication systems: wireless and wired networks, encoding and decoding systems; microwave systems with identifying software tools and mathematical methods required to optimize their performance.
C4.1	Plan the implementation and integration of electronic and electrical communication systems for different engineering applications.

2. **Psychomotor Domain:**

A1.2	Solve complex engineering problems by applying engineering fundamentals, basic science, and mathematics and on basis of limited or contradicting information.
A2.2	Develop and conduct appropriate experimentation and/or simulation and use statistical analyses and objective engineering judgment to draw conclusions.
A3.2	Apply engineering design processes and knowledge of mathematics, science, information technology, to produce cost-effective solutions that meet specified needs and to solve engineering problems.
A4.2	Utilize and incorporate contemporary technologies, codes of practice and standards related to the discipline economic, societal, environmental dimensions and risk management in design.
A5.2	Practice research techniques and methods of investigation.
A6.2	Supervise, monitor and Judge engineering decisions, implementation of engineering projects taking into consideration other trades requirements, costs, benefits, safety, quality, reliability, and environmental impact.
A7.2	Perform efficiently as an individual and as a member of multi-disciplinary and multi-cultural teams.
A8.2	Communicate (verbally/written) and Exchange knowledge and skills with a range of audiences using contemporary tools with engineering community and industry.
A9.2	Apply entrepreneurial and leadership skills to anticipate and respond to new situations.
A10.2	Apply new knowledge; and practice self, lifelong and other learning strategies.
B 1.2	Model electrical power systems by applying the concepts of generation, transmission, and distribution of electrical power systems.
B2.2	Model an electrical/electronic/digital system and develop the tools to optimize this design.
B3.2	Implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.
B4.2	Measure the performance of an electrical/electronic/digital system and circuit under specific input excitation and show its suitability for a specific application.
B5.2	Build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services following suitable national and international standards and codes.
C1.2	Synthesize different electronic and electrical communication systems, measure their performance using the appropriate lab equipment and analyze the obtained results using mathematical methods.
C2.2	Develop innovative solutions for practical industrial problems in electronics and electrical communications engineering based on state-of-the-art designs of components and systems.

C3.2	Analyze and measure the performance of communication systems: wireless and wired networks, encoding and decoding systems; microwave systems with using software tools and mathematical methods required to optimize their performance.
C4.2	Design and integrate electronic and electrical communication systems for different engineering applications.

3. Affective Domain:

A1.3	Acknowledge the importance of engineering fundamentals, basic science and mathematics in solving complex engineering Problems.
A2.3	Praise critical thinking to draw conclusions.
A3.3	Consider social, environmental, ethical and other aspects while applying a design process to achieve solutions.
A4.3	Follow quality guidelines, health and safety requirements, environmental issues and risk management principles.
A5.3	Adopt researching techniques and methods of investigation as an inherent part of learning.
A6.3	Encourage the staff and facilitate the required needs
A7.3	Express appreciation for the contributions of all team members
A8.3	Follow communications ethics guided by community morals and values.
A9.3	Act effectively under difficult and new situation.
A10.3	Adopt learning strategies as an effective lifelong learning strategy.
B1.3	Respect and follow adopted national/international specifications to select the suitable electrical powers system.
B2.3	Seek optimization techniques in the design process electrical/electronic/digital system or component.
B3.3	Recommend using technological and professional tools in the design and implementation of electrical/electronic/digital engineering.
B4.3	Empathize the important of measuring, testing and commissioning any electrical equipment before usage.
B5.3	Adopt suitable national and international standards and codes while design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems.
C1.3	Enhance synthesizing different electronic and electrical communication systems.
C2.3	Offer the knowledge about state-of-the-art designs of components and systems; and develop innovative solutions for practical industrial problems in electronics and electrical communications engineering.

C3.3	Seek the performance of communication systems: wireless and wired networks, encoding and decoding systems; microwave systems with identifying software tools and mathematical methods required to optimize their performance.
C4.3	Facilitate an implementation and integration of electronic and electrical communication systems for different engineering applications.

9. ProgramStructure

Program Duration: 5 years.

Program Structure:

Program Hours: 165 Hrs.

Compulsory hours: 137 Hrs.

Elective hours: 28 Hrs.

Table 3: Courses Classification According to NARS

Course Contents According toNARS	A	B	C	D	E	F	G
NARS%	8-12 %	2-4 %	18-22 %	4-6 %	25-30 %	25-30 %	4-6 %
Hours	18	6	33	9	49	42	8
Catalogue	10.9 %	3.6 %	20 %	5.5 %	29.7 %	25.5 %	4.8 %
Matching	*Matched*	*Matched*	*Matched*	*Matched*	*Matched*	*Matched*	*Matched*

A. Humanities and Social Science, University Requirements.
B. Business Administration
C. Mathematics and Basic sciences
D. Engineering Culture.
E. Basic Engineering Sciences
F. Engineering and design applications
G. Project and field training

1- Social sciences and humanities (18 hours): 10 Hrs. compulsory + 8 Hrs. Selective

A- Compulsory: 10 Hrs.

Code	Course Title	Cr. Hrs	Lec.	Ex.	Lab
HUM 011	Arabic Language	2	2		
HUM 012	English Language 1	2	1	2	
HUM 013	English Language 2	2	1	2	
HUM 352	Human Rights	1	1		
HUM 351	Professional Ethics	1	1		
HUM 381	Principles of Negotiation	2	2		

B- Selective: Select 8 Hrs. from the following Table:

Code	Course Title	Cr. Hrs	Lec.	Ex.	Lab
HUM x62	Music Appreciation	2	2		
HUM x71	Introduction to the History of Civilizations	2	2		
HUM x72	Trends in Contemporary Arts	2	2		
HUM x73	Recent Egypt's History	2	2		
HUM x74	Heritage of Egyptian Literature	2	2		
HUM x75	Arab & Islamic Civilization	2	2		
HUM x76	Literary Appreciation	2	2		

2- Business Administration & Management: (6 Hrs.) = (4 Hrs. compulsory + 2 Hrs. Selective)

A-Compulsory (4 Hrs.)

Code	Course Title	Cr. Hrs.	Lec.	Ex.	Lab
IEN 351	Engineering Economics	2	2	1	
IEN 314	Project Management	2	2	1	

B-Selective: (2 Hrs.)

Code	Course Title	Cr. Hrs.	Lec.	Ex.	Lab
HUM 121	Introduction to Accounting	2	2		
HUM 221	Business Administration	2	2		

3- Mathematics and basic sciences (33 Hrs.)

Code	Course Title	Cr. Hrs	Lec.	Ex.	Lab
BAS 011	Mathematics 1	3	2	2	
BAS 012	Mathematics 2	3	2	2	
BAS 111	Mathematics 3	3	2	2	
BAS 211	Mathematics 4	3	2	2	
BAS 212	Statistics & Probability Theory	3	2	2	
BAS 031	Mechanics	4	3	2	

BAS 041	Engineering Chemistry	3	2	1	2
BAS 021	Physics 1	3	2	1	2
BAS 022	Physics 2	3	2	1	2
MED 011	Engineering Drawing & Projection	3	1	3	3
MED 022	Principles of Manufacturing Engineering	2	2	1	1

4- Engineering culture (9 Hrs.)

Code	Course Title	Cr. Hrs	Lec.	Ex.	Lab
MED 021	History of Engineering & Technology	1	1		
HUM 111	Technical Report Writing	2	1	2	
HUM 182	Analysis & Research Skills	2	1	2	
HUM 181	Communication & Presentation Skills	2	1	2	
HUM 081	Computer Skills	0	1		4
CIW 331	Environmental Impact of Projects	1	1		
IEN 131	Monitoring & Quality Control Systems	1	1		

5- Basic Engineering Sciences (43 Hrs. compulsory + 6 Hrs. Selective) =49 Hrs.

A- Compulsory (43 Hrs.)

Code	Course Title	Cr. Hrs	Lec.	Ex.	Lab
ELP 112	Electrical Circuits 1	2	1	1	1
ELP 113	Electrical Circuits 2	2	1	1	1
ELP 114	Electrical Measurements & Testing	3	2	1	2
ELP 115	Electrical Materials	3	2	2	
ELP 321	Electrical Power	3	2	2	1
ELP 141	Electromagnetic Fields	3	2	2	
ELP 241	Electrical Machines & Transformers	3	2	2	1
ELP 181	Energy Conversion	3	2	2	
ELE 221	Digital & Logic Circuits	3	2	1	2
ELE 222	Electronic Devices	3	2	1	1
ELE 241	Microprocessors & Applications	3	2	1	2
ELE 361	Electrical Communications	3	2	2	1
ELE 271	Signal Analysis	3	2	2	1
ELC 221	Computer Programming	3	2	1	1
ELC 251	Modeling & Simulation of Engineering Systems	3	2	2	1

B- Selective (6 Hrs.):

Code	Course Title	Cr. Hrs	Lec.	Ex.	Lab
ELP 111	Principles of Electrical Engineering	2	2	1	
ELE 121	Principles of Electronic Engineering	2	2	1	
MEP 111	Principles of Mechanical Power Engineering	2	2	1	
MED 111	Principles of Design & Manufacturing Engineering	2	2	1	
CIS 111	Principles of Construction & Building Engineering	2	2	1	
ARC 111	Art & Architecture	2	2	1	

6- Engineering and design Applications 42 Hrs. (36 Hrs. compulsory + 6 Hrs. Selective)

A- Compulsory: (30 Hrs.)

Code	Course Title	Cr. Hrs	Lec.	Ex.	Lab
BAS 311	Mathematics 5	3	2	2	
ELE 411	Integrated Circuits Design	3	2	2	1
ELE 321	Electronic Circuits	3	2	2	1
ELE 461	Antenna & Wave Propagation	3	2	2	1
ELE 462	Digital Communication Systems	3	2	2	1
ELE463	Mobile Communications	3	2	1	1
ELE 471	Digital Signal Processing	3	2	2	1
ELC 331	Computer networks	3	2	2	
ELC 361	Automatic Control	3	2	2	1
ELC 311	Computer organization & Architecture	3	2	2	
ELP 361	Power Electronics	3	2	2	
ELE 322	Electronic Engineering	3	2	2	1

A- Selective (a) select 6 Hrs. from the following table:

Code	Course Title	Cr. Hrs	Lec.	Ex.	Lab
ELE 413	Embedded Systems	3	2	2	
ELE 421	Optoelectronics	3	2	2	1
ELE 422	Medical Electronics	3	2	1	1
ELE 423	Automotive Electronics	3	2	1	
ELE 431	VLSI Technology	3	2	2	
ELE 442	Microcontroller & Application	3	2	1	2
ELE 453	Microwave Engineering	3	2	2	
ELE 454	RADAR Systems	3	2	2	
ELE 455	Acoustics	3	2	2	
ELE 464	Information & Coding Theory	3	2	2	
ELE 465	Optical Communication	3	2	2	1
ELE 466	Telephone Systems	3	2	2	
ELE 467	Satellite Communications	3	2	2	
ELC 432	Information Security	3	2	2	

7- Project and field training (8 Hrs.)

Code	Course Title	Cr. Hrs	Lec.	Ex.	Lab
ELP 491	Project 1	2	1	2	
ELP 492	Project 2	4		4	4
ELP 291	Field Training 1	1			6
ELP 391	Field Training 2	1			6

10. Suggested Study Plan for Electrical Power and Machines Engineering Program

Preparatory (1st Semester)

CourseCode	CourseTitle	WeeklyHours				Grading(Marks)				FinalExamTime
		Lecture	Tutorial	PracticalApplication (Lab)	Cr.Hr	ClassWork	OralorPracticalTest	FinalExam	Total	
BAS 011	Mathematics(1)	2	2	-	3	60	-	90	150	3
BAS 031	Mechanics	3	2	-	4	80	-	120	200	3
BAS 021	Physics(1)	2	1	2	3	52.5	22.5	75	150	3
MED 011	Engineering Drawing and Projection	1	3	3	3	52.5	22.5	75	150	3
HUM 012	EnglishLanguage 1	1	2	-	2	40	-	60	100	2
MED 021	History of Engineering & Technology	1	-	-	1	20	-	30	50	2
Total		10	10	5	16				800	

Preparatory (2nd Semester)

CourseCode	CourseTitle	WeeklyHours				Grading(Marks)				FinalExamTime
		Lecture	Tutorial	PracticalApplication (Lab)	Cr.Hr	ClassWork	OralorPracticalTest	FinalExam	Total	
BAS 012	Mathematics(2)	2	2	-	3	60	-	90	150	3
BAS 041	Engineering Chemistry	2	1	2	3	52.5	22.5	75	150	3
BAS 022	Physics(2)	2	1	2	3	52.5	22.5	75	150	3
HUM 081	Computer Skills	1	-	4	0	-	-	100	100	2
MED 022	Principles of Manufacturing Engineering	2	1	1	2	60	1	75	100	2
HUM 013	EnglishLanguage (2)	1	2	-	2	40	-	60	100	2
HUM 011	Arabic Language	2	-	-	2	40	-	60	100	2
Total		12	7	9	15				750	

First Year (1st Semester)

CourseCode	CourseTitle	WeeklyHours				Grading(Marks)				FinalExamTime
		Lecture	Tutorial	PracticalApplication (Lab)	Cr.Hr	ClassWork	OralorPracticalTest	FinalExam	Total	
--- -A1	Institute Elective A	2	1	-	2	40	-	60	100	2
BAS 111	Mathematics 3	2	2	-	3	60	-	90	150	3
ELP 112	Electrical circuits 1	1	1	1	2	40	10	50	100	2
ELP 114	Electrical measurements &testing	2	1	2	3	52.5	22.5	75	150	3
ELP 141	Electromagnetic fields	2	2	-	3	60	-	90	150	3
HUM 111	Technical report writing	1	2	-	2	40	-	60	100	2
HUM 181	Communications & Presentation skills	1	2	-	2	40	-	60	100	2
Total		**11**	**11**	**3**	**17**				**850**	

First Year (2nd Semester)

CourseCode	CourseTitle	WeeklyHours				Grading(Marks)				FinalExamTime
		Lecture	Tutorial	PracticalApplication (Lab)	Cr.Hr	ClassWork	OralorPracticalTest	FinalExam	Total	
--- -A2	Institute Elective A	2	1	-	2	40	-	60	100	2
ELP 113	Electrical circuits 2	1	1	1	2	40	10	50	100	2
ELP 115	Electrical Materials	2	2	-	3	60	-	90	150	3
ELP 181	Energy Conversion	**2**	**2**	**-**	**3**	**60**	**-**	**90**	**150**	3
HUM 182	Analysis & research skills	2	1	-	3	40	-	60	100	2
IEN 351	Engineering Economics	2	1	-	2	40	-	60	100	2
HUM 381	Principles of Negotation	2	1	-	2	40	-	60	100	2
HUM -A1	General Elective A	2	-	-	2	40	-	60	100	2
HUM -B1	General Elective B	2	-	-	2	40	-	60	100	2
Total		**15**	**7**	**1**	**18**				**900**	

Second Year (1st Semester)

CourseCode	CourseTitle	WeeklyHours				Grading(Marks)				FinalExamTime
		Lecture	Tutorial	PracticalApplication (Lab)	Cr.Hr	ClassWork	OralorPracticalTest	FinalExam	Total	
--- -A3	Institute Elective A	2	1	-	2	40	-	60	100	2
HUM 352	Human Rights	1	-	-	1	20	-	30	50	1
BAS 211	Mathematics 4	2	2	-	3	60	-	90	150	3
ELP 241	Electrical machines &transformers	2	2	1	3	60	15	75	150	3
ELE 221	Digital &logic circuits	2	1	2	3	52.5	22.5	75	150	3
ELC 221	Computer Programming	2	1	1	3	52.5	22.5	75	150	3
HUM–A2	General elective A	2	-	-	2	40	-	60	100	2
Total		13	7	4	17				850	

Second Year (2nd Semester)

CourseCode	CourseTitle	WeeklyHours				Grading(Marks)				FinalExamTime
		Lecture	Tutorial	PracticalApplication (Lab)	Cr.Hr	ClassWork	OralorPracticalTest	FinalExam	Total	
--- 291	Field training 1	-	-	6	1				50	
BAS 212	Statistics & probability theory	2	2	-	3	60	-	90	150	3
ELE 222	Electronic devices	2	1	1	3	52.5	22.5	75	150	3
ELE 241	Microprocessors &applications	2	1	2	3	52.5	22.5	75	150	3
ELE 271	Signal analysis	2	2	1	3	60	15	75	150	3
HUM 182	Analysis &research skills	1	2		2	40	-	60	100	2
ELC 251	Modeling& simulation of engineering systems	2	2	1	3	60	15	75	150	3
Total		11	10	11	18				900	

Third Year (1st Semester)

CourseCode	CourseTitle	WeeklyHours				Grading(Marks)				FinalExamTime
		Lecture	Tutorial	PracticalApplication (Lab)	Total	ClassWork	OralorPracticalTest	FinalExam	Total	
CIW 331	Environmental Impact of Projects	1	-	-	1	20	-	30	50	1
ELP 321	Electrical Power	2	2	1	3	60	15	75	150	3
BAS 311	Math 5	2	2	-	3	75		75	150	3
ELE 321	Electronic Circuits	2	2	1	3	60	15	75	150	3
ELC 331	Computer Networks	2	2	-	3	60	-	90	150	3
ELC 361	Automatic Control	2	2	1	3	60	15	75	150	3
Total		11	10	3	16				800	

Third Year (2nd Semester)

CourseCode	CourseTitle	WeeklyHours				Grading(Marks)				FinalExamTime
		Lecture	Tutorial	PracticalApplication (Lab)	Cr.Hr	ClassWork	OralorPracticalTest	FinalExam	Total	
--- 391	Field Training 2	-	-	6	1				50	
ELP 361	Power Electronics	2	1	1	3	60	15	75	150	3
ELE 322	Electronics Engineering	2	2	1	3	60	15	75	150	3
ELE 361	Electrical Communications	2	2	1	3	60	15	75	150	3
ELC 311	Computer Organization & Architecture	2	2	-	3	60	15	75	150	3
HUM 351	Professional Ethics	1	1		1	20	-	30	50	2
HUM -A3	General Elective A	1	-	-	2	20	-	30	100	2
Total		12	9	10	16				800	

Fourth Year (1st Semester)

CourseCode	CourseTitle	WeeklyHours				Grading(Marks)				FinalExamTime
		Lecture	Tutorial	PracticalApplication (Lab)	Cr.Hr	ClassWork	OralorPracticalTest	FinalExam	Total	
ELE 461	Antenna & Wave Propagation	2	2	1	3	60	15	75	150	3
ELE 462	Digital Communications systems	2	2	1	3	60	15	75	150	3
ELE 471	Digital Signal Processing	2	2	1	3	60	15	75	150	3
ELE 491	Project 1	1	2	-	2	50	50	-	100	-
ELE-A1	Com. & electronics Elective A	2	2	-	3	60	-	90	150	3
IEN 131	Monitring & Quality Control Systems	1	-	-	2	20	-	30	50	2
Total		10	10	3	15				750	

Fourth Year (2nd Semester)

CourseCode	CourseTitle	WeeklyHours				Grading(Marks)				FinalExamTime
		Lecture	Tutorial	PracticalApplication (Lab)	Total	ClassWork	OralorPracticalTest	FinalExam	Total	
ELE 411	Integrated circuit Design	2	2	1	3	60	15	75	150	3
ELE 463	Mobile communications	2	2	-	3	75	-	75	150	3
ELE 492	Project 2	-	4	4	4	100	100	-	200	-
ELE-A1	Com. & electronics Elective A	2	2	-	3	60	-	90	150	3
IEN 314	Project Management	2	2	-	2	40	-	60	100	2
HUM -A1	General Elective A	2	-	-	2	40	-	60	100	2
Total		10	11	5	17				850	

11.Program Admission Requirements:

Having Egyptian Secondary education or equivalent certificate with major in Mathematics, then after passing the preparatory year and fulfilling the admission requirements the students will be able to attend the department.

12.Regulations for progression and program completion:

- The student will be in the first level when he joined the academy. Then, he moves to the second level after the completion of the study of 36 credit hours. In this level, the student must choose the department that he wants to join. After that, he moves to the third level after the completion of the study of 72 credit hours, and moving to the fourth level at the completion of the study of 108 credit hours. Finally, the student moves to the fifth level.
- Courses registration policy is based on the average GPA of the student as follows: The maximum number of hours of teaching (36) credit hours spread over two semesters, and according to the following rules: -
    1. Registration of 18 credit hours for students with an average GPA of 2 or more
    2. Registration of 15 credit hours for students with an average GPA of less than 2 and even 1.5
    3. Registration of 12 credit hours for students with an average GPA of less than 1.5 to 1
    4. Registration of 9 credit hours for students with an average GPA of less than 1
    5. Registration priority will be given in the decisions of the repetition and the decisions of the lower level.

- **The Grades of Success:**

  Table (4) shows the program grades of success

Table (4): The Grades of Success

Symbol	Points	Percentage
A	4.0	%95 more than
A-	3.7	More than 90% and less than 95%
B+	3.3	More than 85% and less than 90%
B	3.0	More than 80% and less than 85%
B-	2.7	More than 75% and less than 80%
C+	2.3	More than 70% and less than 75%
C	2.0	More than 65% and less than 70%
C-	1.7	More than 60% and less than 65%
D+	1.3	More than 55% and less than 60%
D	1.0	More than 50% and less than 55%
F	0.0	Less than 50%

13. Assessment Methods:

Table (5) illustrates how the program assessment methods achieve the program competencies.

		Assessment Methods							
		Written Exam	Oral Exam	Quizzes	Lab Exam	Research Assignments	Reporting Assignments	Project Assignment	In-Class Questions
Program Competencies	A1	*		*		*	*		*
	A2		*		*	*	*		*
	A3	*		*			*	*	
	A4	*		*			*		
	A5					*			*
	A6				*	*	*	*	*
	A7					*	*	*	
	A8		*			*	*	*	
	A9		*			*	*		
	A10						*	*	*
	B1	*	*	*		*	*		
	B2	*		*	*	*	*		
	B3	*	*	*		*	*		
	B4	*		*	*	*	*		
	B5	*		*		*	*		
	C1	*		*			*		
	C2	*		*	*		*		
	C3		*		*		*	*	
	C4	*		*		*	*		

14. Teaching and Learning Methods:

Table (6) clarify the relation between program teaching & learning methods and the program competencies

Table (6): The Relation Between Program Competencies and Teaching & Learning Methods

		Teaching and Learning Methods									
		Face-to-face Lecture	Online Education	Tutorial / Exercise	Group Discussions	Laboratory	Site Visit	Presentation	Mini Project	Research and Reporting	Brain Storming
Program Competencies	A1	*	*	*							
	A2				*	*			*	*	
	A3	*	*	*							*
	A4	*	*	*			*				
	A5									*	*
	A6				*	*	*		*		
	A7							*		*	*
	A8				*			*			
	A9				*			*		*	
	A10				*					*	*
	B1	*	*	*						*	*
	B2	*	*	*					*		
	B3	*	*	*		*		*			
	B4	*	*	*					*		
	B5	*	*	*			*				
	C1	*	*	*						*	
	C2	*	*	*		*			*		*
	C3	*	*	*		*		*	*		*
	C4	*		*		*		*	*		*

15.Evaluation of program learning outcomes

Evaluator	Tool	Sample
1- Senior students	Meeting+ questioner	20%
2- Alumni	questioner	20%
3- Stakeholders (Employers)	Site visits	NA
4-External Evaluator, and/or, External Examiner(s)	External members	NA
5- Others		NA

Program Coordinator:
DR.\Ehab Khaled El-Rafai
signature:
Date

Division Dean:
Prof. Dr\ Saied Elhalfawi
signature:
Date