



Satellite



Embedded Systems



Network



Antennas



Mobile

Undergraduate Program Specifications

Bachelor Degree in Electronics and Communications Engineering (ECE)

Bylaws 2016 According to NARS 2018

2025-2026

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1- General

1.1 Basic Information

Program Title:	Bachelor Degree of Electronics and Communications Engineering
Program Type:	Single Major
Department:	Electronics and Communications Engineering (ECE)
Sharing Departments:	• Basic Science Department • Electrical Power Engineering and Control • Mechatronics
Head of Department:	Prof. Mahmoud Ibrahim Ali
Coordinator:	Dr. Gamal Ahmed El-Sheikh
Awarding Institution:	Pyramids Higher Institute (PHI) for Engineering and Technology / Electronics and Communications Engineering
Academic Standards:	The Program Applies Academic Reference Standards (NARS-2018).
Program Commencement:	2007-2008
Approval Date for Program Specifications:	

1.2 Faculty Members

Staff Members in the Different Electronics and Communications Engineering Specialties;

• Professors:	Mahmoud Ibrahim Ali
• Associate Professors:	Gamal Ahmed El-Sheikh
• Lecturers:	Hanaa Ezat Abdel-Fatah Walaah Omar Al-Farouk Esraa Al-Refaay Mona Shouman
• Assistant Lecturers:	Asmaa Rady Abdel Gawad Olfat Rady Abdel Gawad
• Demonstrators:	Menah Allah Osama Basant Mohamed Esraa Mohamed

1.3 Program Internal and External Reviewing

Program Reviewing was achieved by:

• Internal Reviewer:	Prof. Mahmoud Ibrahim Ali
• External Reviewer:	----
• Reviewer's Reports:	
• Faculty Response to Internal/External Reviewing Reports:	

1.4 Institute Vision, Mission and Objectives

Vision

The Institute occupies a leadership position and excellence locally, regionally and internationally in the engineering fields to serve the community and the surrounding environment.

Mission

Preparing graduates to be distinguished engineers, who are committed to professional ethics, able to compete locally, regionally and internationally, qualified to meet the needs of the labor market and keep pace with engineering and technological developments, and able to continue learning and involved in scientific research to participate in achieving sustainable development.

Objectives

- 1) Preparing distinguished engineers capable of applying mathematical, scientific and technological knowledge and concepts in identifying, formulating and solving specialized engineering problems.
- 2) Qualifying and refining students' abilities with advanced scientific and practical skills.
- 3) Providing attractive work environment for faculty members and their assistants that allow continuous development.
- 4) Developing teaching and learning systems by creating and providing educational environment that achieves creativity and increases the efficiency of the educational process.
- 5) Encouraging and supporting scientific research in various engineering and academic fields.
- 6) Reinforcing the relationship between the institute and its graduates and communicating with educational, industrial institutions and society.
- 7) Continuing the development of work systems in the scientific departments and the institute's departments.
- 8) Establishing a system of continuous improvement and quality management to achieve the vision, mission and goals of the institute.

2- Program Information

2.1 Program Vision

The Electronics and Communications Engineering program prepares graduates that have the efficiency and the capacity to practice Electronics and Communications as a field of profession. The aim to fulfill the local market needs in governmental and private institutions in addition to developing project leaders that are capable to cope with the ever-increasing developments and requirements.

The Electronics and Communications Engineering program is one of the academic, dynamic and advanced programs that focus on preparing the graduate to excel in the ever-growing field of electronics and communications engineering. With state-of-the-art capabilities and a team of dedicated faculty, the program offers a comprehensive and industry-linked curriculum to provide graduates with a strong scientific foundation and practical skills in the field.

By envisioning these goals and continually working to achieve them, the Electronics and Communications Engineering Program seeks to prepare exceptional graduates who will excel in their careers and contribute significantly to the advancement of this field.

2.2 Program Mission

Preparing specialized and scientifically distinguished engineers in electronics, communications engineering, mobile communications, networks, embedded systems, Artificial Intelligence and satellites;

- Capable of creativity, critical thinking, and problem-solving abilities within the framework of professional ethics.
- Empowered in research and innovation to become competent professionals and innovative leaders in the field of electronics, communications engineering, mobile, networking, network security, embedded and satellite systems, intelligent systems, software development, artificial intelligence and the Internet of Things.
- Committed to keeping pace with the growing technological development to serve society and preserve the environment.
- Able to continue self-learning and scientific and academic research.

The Electronics and Communications program is always committed to provide the graduates with knowledge, database and skills for continuous education and to continue in post graduate programs.

2.3 Program Objectives

- The graduate should be able to apply engineering, mathematical and practical knowledge in the field of electronics and communications engineering and its applications in the real world.
- Has the ability to solve creative engineering problems in application areas.
- The graduate applies strong ethical and professional values and is committed to environmental and social responsibilities.
- Qualified to work with leading industries, research organizations and academia to bridge the gap between theory and practice at the national and international levels.
- Capable of self-learning, working in a team, effective communication and leadership.

2.4 Graduate Attributes of the ECE

The Electronics and Communications Engineering Graduate must:

- 1) Master a wide spectrum of engineering knowledge, basic sciences and specialized skills in addition to the capability of applying acquired knowledge using theories and abstract thinking in real life situations.
- 2) Recognize his/her role in promoting the engineering field and contribute in the development of the profession and the community. Value the importance of both physical and natural environment and work to promote sustainability principles.
- 3) Use techniques, skills and modern engineering tools necessary for engineering practice; Work in and lead a heterogeneous team of professionals from different engineering specialties and assume responsibility for own and team performance.
- 4) Assume full responsibility for own learning and self-development, engage in lifelong learning and demonstrate the capability to engage in post-graduate and research studies.
- 5) Communicate effectively using different modes, tools and languages with various audiences to deal with academic/professional challenges in a critical and creative manner.
- 6) Demonstrate leadership qualities, business administration and entrepreneurial skills with professional behavior and adhere to engineering ethics and standards.
- 7) Design robust ECE projects with creativity in addition to demonstrating investigative skills, attention to details and visualizing conceptualize skills.
- 8) Adopt a holistic problem solving approach for complex, ambiguous, and open-ended challenges and scenarios. Apply analytic, critical and systemic thinking to identify, diagnose and solve engineering problems with a wide range of complexity and variations.
- 9) Demonstrate knowledge of cultural diversity, differences and impact of communication on community character and health. In addition, address urban issues, planning, and community needs through design work.
- 10) Recognize the new role of telecommunication engineering with networking issues as the leader of projects' design who has the ability to understand, assemble, and coordinate all of the disciplines to create a sustainable work.

Appendix-1: Matrix of institute and program mission vs. graduate attributes.

2.5 Program Aims

- 1) Integrate and apply acquired knowledge of fundamental engineering, mathematics, basic science, and skills, using theories and abstract thinking in real life situations of Electronics and Communications Engineering (ECE).
- 2) Utilize analytic critical and systemic thinking to identify, diagnose and solve ECE engineering problems with a wide range of complexity and diversity.
- 3) Work professionally and adhere to engineering ethics and standards.
- 4) Work as a member or leader in an engineering multi-disciplinary team and assume responsibility for own and team performance.
- 5) Show awareness and demonstrative role in promoting the ECE engineering techniques and the society development.
- 6) Identify contemporary ECE engineering knowledge and techniques, work to promote sustainability principles and value the importance of the environment both physical and natural to select the suitable Electronics and Communications constituents.
- 7) Apply different techniques, skills, and modern engineering tools necessary in Electronics and Communications engineering fields.
- 8) Pursue own learning including self- development and life-long learning and demonstrate the capability to engage in post-graduate and research studies.
- 9) Communicate effectively using different technologies, tools and languages with various audiences; to deal with academic/professional challenges in a critical and creative manner.
- 10) Prove leadership qualities, business administration and entrepreneurial skills.
- 11) Design robust ECE projects with creativity and ability to demonstrate investigative skills, attention to details, and visualize conceptualize skills.
- 12) Adopt a holistic problem solving approach for complex, ambiguous, and open-ended challenges and scenarios.
- 13) Demonstrate knowledge of cultural diversity, differences and impact of communication towers on community character and health. In addition, address urban issues, planning, and community needs through design work.
- 14) Recognize the new role of telecommunication engineering as the leader of design projects who has the ability to understand, assemble, and coordinate all of the disciplines to create a sustainable work.

3- Program Learning Outcomes (LOs)

By the end of the program the graduate should be able to:

Level-A (Basic Engineering Information)

- 3.1 Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
- 3.2 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.
- 3.3 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.
- 3.4 Utilize contemporary technologies, codes of practice and standards, quality guidelines, health and safety requirements, environmental issues and risk management principles.
- 3.5 Practice research techniques and methods of investigation as an inherent part of learning.
- 3.6 Plan, supervise and monitor implementation of engineering projects, taking into consideration other trades requirements.
- 3.7 Function efficiently as an individual and as a member of multi-disciplinary and multicultural teams.
- 3.8 Communicate effectively; graphically, verbally and in writing; with a range of audiences using contemporary tools.
- 3.9 Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.
- 3.10 Acquire and apply new knowledge; and practice self, lifelong and other learning strategies.

Level-B: Specialized Information; Program Aims and Program Learning Outcomes (LOs)

- 3.11 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.
- 3.12 Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
- 3.13 Design and implement: elements, modules, sub-systems or systems in electrical/ electronic/ digital engineering using technological and professional tools.
- 3.14 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.
- 3.15 Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.

Level-C

- 3.16 Illustrate and apply** the core mathematical, scientific, and engineering principles, including software tools, to **model and analyze** components and systems in Electronics and Communications Engineering (ECE), and assess their performance limitations.
- 3.17 Design, implement, and test** elements, modules, and full systems in ECE; including analog, digital, and embedded systems; by selecting appropriate components, technologies, and control techniques to meet specific requirements and optimize performance.
- 3.18 Design and compare** various telecommunication and network systems, including satellite communications with GPS and GIS, by applying a range of analytical tools, techniques, and equipment, and integrating multiple technologies to achieve high-quality, cost-effective solutions.
- 3.19 Apply and blend** new and advanced technologies, such as **Artificial Intelligence (AI)**, **Internet of Things (IoT)**, and network security concepts, to model, design, and build **smart systems** and complex ECE systems and networks.
- 3.20 Demonstrate and interpret** the use of measurement devices and experimental techniques to characterize the performance of ECE components and dynamic systems, accurately classifying and evaluating system response under various excitations.
- 3.21 Exercise creative and innovative approaches** to identify, analyze, and solve complex, non-trivial problems in ECE; spanning Electronics, Circuits, and communication systems; and apply advanced analytical and modeling techniques to find optimal solutions.
- 3.22 Identify needs, plan, manage resources**, and effectively **document and communicate** technical solutions for digital and embedded problems, following professional practices like establishing robust development, testing, and release environments (combines software development (Dev) and IT operations (Ops); DevOps principles).

4- Program Academic Reference Standards

The academic standards invoked in this specification are driven based on the Academic Reference Standards competency based education system (A, B, C levels) according to NARS-2018 issued by NAQAAE (attachment-1) and approved by department council on 5-10-2021 (attachment-2) and approved by the Institute Academic Council on 18-10-2021 (attachment-3).

5- Reference Checks (Bench Mark)

- 5.1 Schedule identifies what program competencies achieve in comparison of NARS-2018 & ABET 2021-2022.
- 5.2 Matrix Achieving Courses for program competencies.
- 5.3 Matrix Achieving competencies for program objectives.
- 5.4 Matrix Achieving Graduate Attributes for the program mission.
- 5.5 Strategy of E-Learning and Hybrid learning.
- 5.6 Matrix of learning methods & techniques and its relationships with competencies.
- 5.7 Matrix of assessment tools Achieving program competencies.
- 5.8 Matrix Achieving Graduate Attributes for the Institute Mission.
- 5.9 Matrix of what the program competencies achieve from the Attributes of the graduate.

6- Program Structure and Duration

6.1 Program Duration

The duration of the B.Sc. Electronics and Communications Engineering Department is five years for normal student to complete the program. The following tables indicate the subjects' areas and their percentages in the program.

6.2 Program Structure

The program applies the Semester Course System which is based on contact hours. The students should complete (60+ 2 training) courses, (275+ 6 training) hours=281 contact hours summarized as follows:

Course	Number	Activity	Hours
Compulsory Courses	55	Lectures	131
Elective Courses	5	Tutorials\Exercises	94
Training Courses	2	Laboratory	50
Total Courses	62	Summer Training	6
		Total Contact Hours	281

6.3 Program Courses

Appendix-5

6.4 Contacts' Distribution and Conformity to Requirements According to NARS:

	Freshman إعدادي	Sophomore الفرقة الأولى	Junior الفرقة الثانية	Senior 1 الفرقة الثالثة	Senior 2 الفرقة الرابعة	Total	Total / 275 %	NARS %
Humanities	18	---	2	3	5	28	10.2	9-12
Basic Science	29	18	9	---	---	56	20.4	20-26
Basic Engineering	5	28	23	---	---	56	20.4	20-23
Applied Engineering and Design	---	---	11	39	10	60	21.8	20-22
Computer Applications and ICT	4	9	10	---	5	28	10.2	9-11
Project and Practice	---	---	---	9	16	25	9.1	8-10
Subtotal	56	55	55	51	36	253	92	92-94
Discretionary Subjects	---	---	---	5	17	22	8	6-8
Total	56	55	55	56	53	275	100	100

Course Group	Course Code	Course Name	Lecture	Exercise	Lab	Contact	Total	Total / 275 %	NARS %
A Humanities	HUM-016	Technical English	2			2	28	10.2	9-12
	HUM-017	History of Engineering & Technology	2			2			
	MCH-026	Production Technology and Workshop	2	1	2	5			
	ELC-225	Electric Machines and Drives	2	2	1	5			
	HUM-226	Engineering Safety & Standards	2			2			
	HUM-316	Technical Report Writing & Presentation Skills	2	2		4			
	HUM-416	Engineering Ethics and Legislations	2			2			
	HUM-424	Engineering Economy & Management	2	2		4			
B Basic Science	BAS-011	Mathematics (1)	2	2		4	56	20.4	20-26
	BAS-012	Physics (1)	2	2	1	5			
	BAS-013	Mechanics (1)	2	2		4			
	BAS-014	Industrial Chemistry	2	2	1	5			
	BAS-021	Mathematics (2)	2	2		4			
	BAS-022	Physics (2)	2	2	1	5			
	BAS-023	Mechanics (2)	2	2		4			
	BAS-111	Mathematics (3)	2	2		4			
	BAS-112	Physics (3)	2	2	1	5			
	ELC-115	Acoustics and Optics	2	2	1	5			
	BAS-121	Mathematics (4)	2	2		4			
	ELC-122	Electromagnetic Field Theory	2	2	1	5			
	BAS-211	Mathematics (5)	2	2		4			
	BAS-221	Probability Theory and Statistics	2	2	1	5			
C Basic Engineering	MCH-015	Engineering Drawing & Projection (1)	1	4		5	56	20.4	20-23
	BAS-023	Mechanics (2)	2	2		4			
	MCH-025	Engineering Drawing & Projection (2)	1	3		4			
	ELC-113	Electrical Circuits (1)	2	2	1	5			
	MCH-116	Engineering Materials	2	1		3			
	ELC-122	Measurements & Instrumentations (1)	2	1	2	5			
	ELC-123	Electrical Circuits (2)	2	2	1	5			

		ELC-124	Electronics (1)	2	2	1	5			
		ELC-125	Logic Circuit Design (1)	2	2	1	5			
		ELC-212	Measurements & Instrumentations (2)	2	1	1	4			
		ELC-214	Electronics (2)	2	2	1	5			
		ELC-215	Logic Circuit Design (2)	2	2	1	5			
		ELC-216	Electromagnetic Field Theory	3	2		5			
		ELP-224	Electric Machines	2	1	1	4			
D	Applied Engineering and Design	ELC-222	Signal Analysis	3	2	1	6	60	21.8	20-22
		ELC-223	Microwave Theory	3	2		5			
		ELC-312	Analog Communications	3	2		5			
		ELC-313	Antennas and Wave Propagation	4	2		6			
		ELC-314	Automatic Control (1)	3	2		5			
		ELC-315x	Elective (1)	2	2		4			
		ELC-321	Digital Signal Processing	3	1	1	5			
		ELC-322	Digital Communications	3	1	1	5			
		ELC-323	Telephone Circuits and Switches	2	1	1	4			
		ELC-324	Automatic Control (2)	3	2		5			
		ELC-412	Mobile Communications	3	1	1	5			
		ELC-415x	Elective (4)	2	2	1	5			
E	Computer Applications and ICT	CMP-024	Fundamentals of Programming	2		2	4	28	10.2	9-11
		ELC-114	Advanced Programming	2	1	2	5			
		ELC-115	MATLAB Programming	2		2	4			
		ELC-213	Applied Computer Programming		1	4	5			
		ELC-221	Microprocessors Based Systems	2	1	2	5			
		ELC-414x	Elective (3)	2	2	1	5			
F	Project and Practice	ELC-311	Microcontrollers & Embedded Systems	2	1	2	5	25	9.1	8-10
		ELC-326x	Elective (2)	2	2		4			
		ELC-411	Communication Networks	3	2	1	6			
		ELC-413	Graduation Project (1)	2	1	1	4			
		ELC-423	Graduation Project (2)		2	4	6			
	Subtotal							253	92	92-94
G	Discretionary Subjects	ELC-325	Information Theory and Coding	3	2		5	22	8	6-8
		ELC-421	Optical Communications	3	2	1	6			
		ELC-422	Satellite Communications	3	2	1	6			
		ELC-424x	Elective (5)	2	2	1	5			
	Total							275	100	100

6.5 Detailed Curriculum Contents by Subject Contact Hours

Appendix-6

7- Curriculum Contents for Electronics and Communications Engineering

7.1 Table 1: Indicative Curricula Content by Subject Area

	Subject Area	Total %	NARS %
A	Humanities, Ethical and Social Sciences	10.2	9-12
B	Mathematics and Basic Science	20.4	20-26
C	Basic Engineering	20.4	20-23
D	Applied Engineering and Design	21.8	20-22
E	Computer Applications and ICT	10.2	9-11
F	Project and Practice	9.1	8-10
	Subtotal	92	92-94
G	Discretionary Subjects	8	6-8
	Total	100	100

7.2 Program Courses/Semester/Year:

Description of the Program Courses (Appendix-)

Review the description of courses in the Bachelor of Electronics and Communications Engineering program.

8- Program Enrollment Requirements (Requirements for the Admission in the Program)

Egyptian students with a high school diploma or equivalent and who have a technical high school diploma are accepted annually and the students' nomination to the institute is through the Admissions Coordination Office.

The study begins with the initial year (general\preparatory) followed by four years in the specialization of Electronics and Communications Engineering.

Program Admission Requirements: The student's registration is required to be;

- 1- Holds a high school diploma or its equivalent, and admission to the order of success degrees are also accepted and the graduates of the technical high school's diploma are accepted in some institutes and in accordance with the rules and regulations set by the Ministry of Higher Education and the Supreme Council of Universities.
- 2- It is not permissible to exceed the conditions of the coordination office with regard to students' distribution or transfers.
- 3- The medical examination should prove that he\she is free of infectious diseases and his\her suitability to follow up the study in accordance with the rules set by the Supreme Council for the Affairs of Institutes.
- 4- Be full-time to study at the Institute in accordance with the rules of internal regulations.
- 5- Student should be reputable.

Each student is given a university card for the institute, with his photo stuck on it, signed by the institute-dean, and stamped with the institute's seal. This card must be presented in every academic matter\activity as he\she is not allowed to attend lectures, scientific exercises, labs, or take exams unless he holds his university card.

9- Rules Governing the Progression and Completion of the Program

The program consists of a preparatory year (one year) and four years in the field of Electronics and Communications Engineering.

The duration of the program is five academic years and study in the classroom system and each academic year consists of two semesters divided into:

- Semester-1: 15 weeks
- Semester-2: 15 weeks

It requires that the student be awarded a bachelor's degree in Electronics and Communications Engineering to successfully pass all the following courses:

- Success in all courses in accordance with the study and education plan for this regulation, which is implemented by the Institute distributed in accordance with Article 45.
- Passing the training scheduled in accordance with the assessment provided for in article 35.
- Graduation Classes end by May and September of each school year and after approving of the results from the Ministry of Higher Education.
- The student is allowed to return any course in which he/she fails and repeats a study and examination after paying the prescribed educational service fees.
- The graduation project is divided into two complementary semesters.
- The student must perform practical training inside or outside the institute for 6 weeks (8 hours per day * 6 days per week / each semester) and the student must submit a full report on the topics he/she has been trained and discuss this report before the committee of faculty members of the institute, from outside and from industry in the specialty that has been trained.

The student's performance at the end of the semester is assessed in each course according to the following levels:

Degree	Percentage obtained by the student
Excellent	$\geq 85\%$
Very Good	$\geq 75\%$ and $< 85\%$
Good	$\geq 65\%$ and $< 75\%$
Sufficient	$\geq 50\%$ and $< 65\%$
The failed student is assigned a degree as follows;	
Low	$\geq 30\%$ and $< 50\%$
Very Low	$< 30\%$

- The passing grade for any academic year is calculated as the result of dividing the total final grades obtained by the student in that academic year divided by the total final grades for the courses studied in the year.
- When a student repeats a course exam he has previously failed in, the grade he obtained in the re-sit will be counted with a maximum sufficient score of 64%.

10- Methods and Rules for Evaluating the Program's Enrollees (Means of Evaluating the Targeted Learning Program Outcomes)

No	Method	Measure targeted educational outputs
1	Exercises	Applying knowledge and concepts; thinking about solutions in a creative way; results' analysis.
2	Individual Projects	Solving Electronics and Communications and design problems; information search; self-education practice; time management.
3	Group Projects	Solving Electronics and Communications and design problems; the ability to work in a team; working in a stressful environment and communicate effectively.
4	Research	Analysis of knowledge and concepts and integration of different forms of knowledge; prepares and presents research; search for information; self-learning.
5	Quizzes & Midterm	Student acquisition of knowledge, concepts and skills of the course; solving engineering problems; time management.
6	Practical Examinations	Analytical thinking to choose appropriate solutions to engineering problems; time management.
7	Oral Examinations	Present reports; present Electronics and Communications; design and planning projects; communicate effectively.
8	Attendance	Commitment; Communicating effectively; reporting; projects.
9	Final Exams	Student's acquisition of knowledge, concepts and skills of the course.
10	Graduation Project	To measure the knowledge, concepts and skills of the course.
11	Summer Training	To measure the practical and professional application of different knowledge and skills and acquire general and transferred skills.
12	Achievement File	Complete the student within five years in the different courses to see how much he\she progresses through the years of study.
13	Case Studies and Field Visits	Study of different Electronics and Communications design projects and new technologies with real applications.

11- Methods of Evaluating the Program

Evaluator	Method	Sample
Final year students	Questionnaires	80-100%
Graduates	Questionnaires	Similar sample
Employers	Questionnaires and meetings	Similar sample
External Evaluator	Report	One Evaluator or two
Other ways	Faculty member's satisfaction questionnaire on the program.	All appointed faculty members and associates
Stakeholders	Questionnaires	Representative sample related to specialty 30%

Program description preparation team:

- 1) Dr Gamal El-Sheikh (Coordinator)
- 2) Ass. Lect. Asmaa Rady Abdel Gawad

12- Attachments

- 1) The Academic Reference Standards of the Program (Competency Based Education; levels A, B, C) according to NARS-2018.
- 2) Department Council Minute (5-10-2021).
- 3) The Approval of the Institute Academic Council (18-10-2021).

13- Reference Checks' Documents

14- Teaching and Learning Methods

No	Method	Competencies Addressed		
		Level-A	Level-B	Level-C
1	Interactive lectures	A1, A2, A3, A4, A8		C1, C2
2	Discussions; Class Activity	A3, A6, A7, A8		C3, C4, C6
3	Brain Storming	A9		C5, C6
4	Problem Solving	A1, A2, A6		C1, C6
5	Case Study	A3, A4	B2	C3, C4, C5
6	Practical Training	A2	B3, B4	C2, C5
7	Self-Learning (Individual and Group Research - Assignments -Presentations)	A5, A10	B2	C7
8	Field Training (summer training)	A1, A6	B1	C1, C4
9	Graduation project	A3, A6, A7	B2	C2, C7
10	Demonstration Videos	A8		C1, C5
11	Workshops	A4, A7, A9	B5	C6
12	Field visit	A1, A4, A6	B1	C1, C3
13	Asynchronous learning	A5, A10	B2	C4, C6

15- Assessment Methods of the Students

No	Method	Measure targeted educational outputs	Program LOs
1	Written exam (Quizzes, Midterm, Final exams)	Applying knowledge and concepts - thinking about solutions in a creative way – results' analysis	A1, A2, A3, A6, A10, C1, C2, C6
2	Oral examinations	Solving structural and design problems - information search - self-education practice - time management.	A7, A8, C7
3	Practical examinations	Solving structural and design problems - the ability to work in a team - working in a stressful environment.	A2, B4, C5
4	Self-learning (Research Individual projects Group projects)	Analysis of knowledge and concepts and integration of different forms of knowledge - prepares and presents research - search for information - self-learning.	A5, A10, B2, C3, C4
5	Attendance and participation	Commitment - Communicating effectively - reporting – projects.	A7, A10
6	Graduation Project	To measure the knowledge, concepts and skills acquired by the student during the previous five years	A3, A6, C2, C3, C4, C6, C7
7	Summer training	To measure the practical and professional application of different knowledge and skills and acquire general and transferred skills.	A1, A4, A6, A10
8	Portfolio	A portfolio showcases a student's work and reflections; it demonstrates their understanding, skills, and ability to communicate effectively.	A8, A10, C1, C2, C3

Internal evaluator	Report	1 or 2 evaluator
External evaluator	Report	One evaluator
Other ways	Institute members' satisfaction questionnaire on the program.	All appointed Institute members and assessments
Other ways	Ministry of higher education and research	Annual report

Program Coordinator:

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Prof Gamal Ahmed El-Sheikh

Head of the Department:

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Prof Gamal Ahmed El-Sheikh

16- Appendices:

- Appendix 1: Matrix of institute mission vs. program mission
- Appendix 2: Matrix of program mission vs. graduate attributes
- Appendix 3: NARS 2018
- Appendix 4: matrix program aims vs. graduate attributes
- Appendix 5: matrix program aims vs. program LOs
- Appendix 6: matrix program LOs vs. NARS competences
- Appendix 7: program Los vs. graduate attributes
- Appendix 8: course vs. program LOs
- Appendix 9: course specifications