Program Specification

(2025-2026)

1. Basic Information

ProgramTitle:	Communications and Electronics Engineering Program
Total number of hours of the program:	165
Number of academic levels (expected program duration):	5 Levels
Department (s) Participating (if any) in teaching the program:	▪ Basic Science Department ▪ Electronics & Communications Engineering Department (Electronics & Communications Engineering /Computer Engineering Programs) ▪ Civil Engineering Department
Institute:	Misr Higher Institute for Engineering and Technology
Academy:	Ministry of Higher Education and Scientific Research
Program majors/divisions/tracks/specialties in the final year (if any):	-------
Partnerships with other parties and the nature of each (if any):	-------
Name of the program coordinator (attach the assignment decision):	Dr. Ibrahim Elmetwally Ramadan
Program Specification Approval Date:	18/8/2025 8/9/2025
Council responsible for Program Specification Approval (Attach the Decision / Minutes):	Electronics & Communications Engineering Department Council, Institute Council

2. Program Aims (Brief description of the overall purpose the program)

The Electronics and Communications Engineering Program aims to prepare a competent engineer capable of designing, analyzing, and testing communication networks (wired, wireless, and microwave) as well as digital and embedded electronic circuits. The program develops analytical thinking skills to solve complex industrial and engineering problems innovatively using state-of-the-art software and laboratory measurement equipment. It also focuses on instilling professional ethics, safety principles, and sustainable design, alongside enhancing leadership, teamwork, effective communication, and continuous learning to keep pace with rapid developments in the job market.

3. Program Structure (Curriculum)

- **Program Component**

Requirement Category/Type		Number of Courses	Number of credit hours	Percentage from the total number of hours
University Requirements		8	14	8.48%
Faculty/College Requirements (if applicable)		21	46	27.88%
Program Requirements		33	97	58.79%
Requirements of the majors/ divisions/ tracks/ specializations in the final year (if any)		-	-	-
Other requirements	Field Training	1	0	0%
	Graduation Project	2	6	3.64%
	Mandatory training year	2	2	1.21%
	Other (Vocational Training)	1	0	0%
Total Compulsory Courses		58	145	89.70%
Elective Courses		10	20	10.30%
Total		68	165	100%

- **Program courses according to the expected study plan**

Academic Level	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of Credit Hours	Number of Weekly Hours		
							Theoretical teaching	Tutorial	Practical
000	First	BAS011	Engineering Mathematics (1)	Compulsory	Faculty	4	3	3	0
000	First	BAS021	Engineering Physics (1)	Compulsory	Faculty	3	2	1	1
000	First	BAS031	Engineering Mechanics (1)	Compulsory	Faculty	3	2	2	0
000	First	ENG011	Engineering Manufacturing Principles	Compulsory	Faculty	2	2	0	2
000	First	ENG021	Engineering Drawing	Compulsory	Faculty	3	1	3	0
000	First	GEN011	English Language	Compulsory	University	2	1	2	0
000	Second	BAS012	Engineering Mathematics (2)	Compulsory	Faculty	4	3	3	0
000	Second	BAS022	Engineering Physics (2)	Compulsory	Faculty	3	2	1	1
000	Second	BAS032	Engineering Mechanics (2)	Compulsory	Faculty	3	2	2	0
000	Second	GEN051	Computer Skills	Compulsory	University	2	2	1	1
000	Second	GEN021	Engineering and Technology History	Compulsory	University	1	1	0	0
000	Second	BAS041	Engineering Chemistry	Compulsory	Faculty	3	2	1	1
000	Second	GEN041	Human Rights	Compulsory	University	1	1	0	0
000	Summer	ENG041	Basic Training	Compulsory	Faculty	1			
100	First	BAS111	Engineering Mathematics (3)	Compulsory	Faculty	3	2	2	0
100	First	BAS112	Discrete Mathematics	Compulsory	Major	3	2	2	0
100	First	ELE121	Solid States Electronics	Compulsory	Major	3	2	2	0
100	First	ELP111	Electrical Circuits	Compulsory	Major	3	2	2	0
100	First	ELC121	Programming and systems representation	Compulsory	Faculty	2	1	1	1
100	First	GEN15X	Elective 1 - university	Elective	University	2	2	0	0
100	First	ENG141	Technical Report Writing	Compulsory	Faculty	2	1	2	0
100	Second	BAS113	Differential equations	Compulsory	Major	3	2	2	0
100	Second	ELE111	Electronic Testing (1)	Compulsory	Major	3	1	0	4

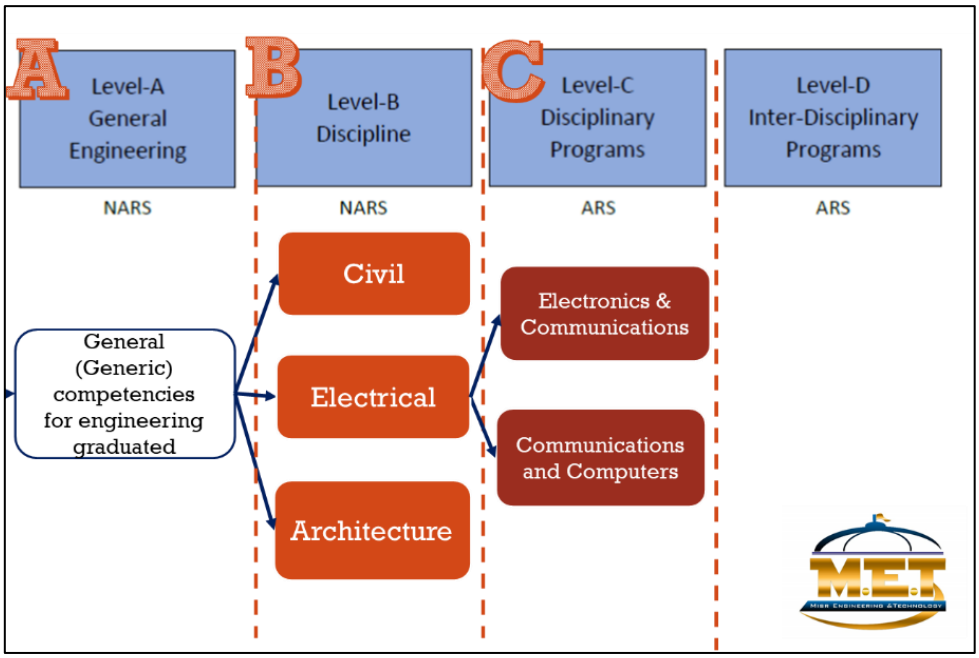
Academic Level	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of Credit Hours	Number of Weekly Hours		
							Theoretical teaching	Tutorial	Practical
100	Second	BAS114	Complex variables	Compulsory	Major	3	2	2	0
100	Second	ELE112	Electrical Measurements and sensors	Compulsory	Major	3	2	1	2
100	Second	ELC111	Digital Design	Compulsory	Major	3	2	1	2
100	Second	GEN15y	Elective Course 2 - university	Elective	University	2	2	0	0
100	Summer	ENG142	Specialized training	Compulsory	Major	1			
200	First	BAS211	Partial differential equations	Compulsory	Major	3	2	2	0
200	First	ELE241	Electromagnetic fields	Compulsory	Major	3	2	2	0
200	First	ELC221	Object Oriented Programming	Compulsory	Major	3	2	1	2
200	First	ELC211	Computer Organization	Compulsory	Major	3	2	1	2
200	First	BAS212	Statistics and Probability Theory	Compulsory	Faculty	2	1	2	0
200	First	ENG231	Contracts and legislation	Compulsory	Faculty	1	1	0	0
200	Second	BAS213	Operations research	Compulsory	Faculty	2	1	2	0
200	Second	BAS214	Numerical Methods	Compulsory	Major	3	2	2	0
200	Second	ELE261	Signal Analysis	Compulsory	Major	3	2	2	0
200	Second	ELE221	Electronic circuits	Compulsory	Major	3	2	2	0
200	Second	ELC261	Automatic Control	Compulsory	Major	3	2	1	2
200	Second	ENG21x	Elective Course 3 – institute	Elective	Faculty	1	1	0	0
200	Second	ENG21y	Elective Course 4 – institute	Elective	Faculty	1	1	0	0
200	Summer	ENG241	Field training	Compulsory	Major	0			
300	First	ELE331	Integrated Circuits Design	Compulsory	Minor	3	2	2	0
300	First	ELE341	Electromagnetic Waves	Compulsory	Minor	3	2	2	0
300	First	ELC311	Microprocessors	Compulsory	Major	3	2	1	2
300	First	ELC331	Computer Networks	Compulsory	Major	3	2	1	2
300	First	ELP311	Energy Conversion	Compulsory	Major	2	1	2	0
300	First	ENG33x	Elective course 5 – institute	Elective	Faculty	1	1	0	0
300	Second	ELE32x	Elective course (7)	Elective	Minor	3	2	2	0

Academic Level	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of Credit Hours	Number of Weekly Hours		
							Theoretical teaching	Tutorial	Practical
300	Second	ELE351	Communication Systems	Compulsory	Minor	3	2	2	0
300	Second	ELE342	Microwave Engineering	Compulsory	Minor	3	2	2	0
300	Second	ELP312	Electric Power and Machines	Compulsory	Major	3	2	2	0
300	Second	ELE312	Electronic Testing (2)	Compulsory	Minor	2	1	0	2
300	Second	GEN351	Research and analysis Skills	Compulsory	University	2	1	0	2
300	Second	ENG33y	Elective course 6 – institute	Elective	Faculty	1	1	0	0
300	Summer	ENG341	Vocational training	Compulsory	Minor	0			
400	First	ELE451	Digital Communications	Compulsory	Minor	3	2	2	0
400	First	ELE461	Digital Signal Processing	Compulsory	Minor	3	2	2	0
400	First	ELE44x	Elective course (8)	Elective	Minor	3	2	2	0
400	First	ELC46x	Elective course (9)	Elective	Minor	3	2	2	0
400	First	ENG411	Environmental Impact of Projects	Compulsory	Institute	1	1	0	0
400	First	ELE471	Project (1)	Compulsory	Minor	2	1	0	2
400	Second	ELE445	Antenna and Wave Propagation	Compulsory	Minor	3	2	2	0
400	Second	ELE45x	Elective Course (10)	Elective	Minor	3	2	2	0
400	Second	ELE456	Wireless and Optical Communications	Compulsory	Minor	3	2	2	0
400	Second	GEN431	Energy, Water and Climate Change Issues	Compulsory	University	2	2	0	0
400	Second	ENG431	Monitoring & Quality Control Systems	Compulsory	Faculty	1	1	0	0
400	Second	ELE472	Project (2)	Compulsory	Minor	4	1	0	6

4. Academic Standards

- **Adopted Academic Standards (NARS/ARS):** Choose an item.

The National Academic Reference Standards (NARS, 2018) for Engineering have been adopted for A and B competencies while a New Academic Reference Standards (ARS) for C Competencies for Electronics and Communications Engineering Program is proposed.



National Academic Reference Standards (NARS)		Academic Reference Standards (ARS)	
Code	**Text**	**Code**	**Text**
General Engineering Competencies			
A.1	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	**A.1**	Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.
A.2	Develop and conduct experiments and / or simulations, analyze and interpret data, evaluate and derive results and use statistical analyzes to arrive at conclusions.	**A.2**	Develop and conduct experiments and / or simulations, analyze and interpret data, evaluate and derive results and use statistical analyzes to arrive at conclusions.
A.3	Application of engineering design to achieve cost-effective solutions that meet specific needs. Taking into account global, cultural, social, economic, environmental and ethical aspects. These applications are within the principles of sustainable design and development.	**A.3**	Application of engineering design to achieve cost-effective solutions that meet specific needs. Taking into account global, cultural, social, economic, environmental and ethical aspects. These applications are within the principles of sustainable design and development.
A.4	Use of contemporary technologies, standards, specifications and codes of practice, principles of quality, health and safety requirements,	**A.4**	Use of contemporary technologies, standards, specifications and codes of practice, principles of quality, health and safety requirements,

National Academic Reference Standards (NARS)		Academic Reference Standards (ARS)	
Code	**Text**	**Code**	**Text**
	environmental issues, principles of risk management.		environmental issues, principles of risk management.
A.5	Practice research and investigation methods as an integral part of learning.	**A.5**	Practice research and investigation methods as an integral part of learning.
A.6	Planning, supervision and monitoring of engineering projects.	**A.6**	Planning, supervision and monitoring of engineering projects.
A.7	Work efficiently as an individual and as a member of a multidisciplinary and multicultural working group.	**A.7**	Work efficiently as an individual and as a member of a multidisciplinary and multicultural working group.
A.8	Communicate effectively - graphically, verbally and in writing - with others using modern tools.	**A.8**	Communicate effectively - graphically, verbally and in writing - with others using modern tools.
A.9	Use creative, innovative, flexible ideas, and gain entrepreneurial and leadership skills to anticipate and react to new circumstances.	**A.9**	Use creative, innovative, flexible ideas, and gain entrepreneurial and leadership skills to anticipate and react to new circumstances.
A.10	Acquisition and application of new knowledge; and pursuit of self-learning, lifelong learning.	**A.10**	Acquisition and application of new knowledge; and pursuit of self-learning, lifelong learning.
Specialization Competencies (Electrical Engineering)			
B.1	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.	**B.1**	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.
B.2	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	**B.2**	Design, model and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.
B.3	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.	**B.3**	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital engineering using technological and professional tools.

National Academic Reference Standards (NARS)		Academic Reference Standards (ARS)	
Code	**Text**	**Code**	**Text**
B.4	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.	**B.4**	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.
B.5	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.	**B.5**	Adopt suitable national and international standards and codes to: design, build, operate, inspect and maintain electrical/electronic/digital equipment, systems and services.
Specialization Competencies (Electronics & Communications Engineering)			
		C.1	Design, analyze and measure the performance of wireless and wired communication, communication networks, coding and decoding and microwave components and systems with identifying the software tools and mathematical methods required to optimize their performance.
		C.2	Develop innovative solutions for practical industrial problems in Electronics and Communications Engineering.
		C.3	Synthesize different electronic and communication systems, measure the performance using the appropriate lab equipment and analyze the obtained results using mathematical methods.
		C.4	Design, implement and integrate specific electronic systems for certain engineering applications.

- **Date of Adoption of Standards in the governing Council: 1/9/2024**
  *** Decision/Minutes of the governing Council to be attached**

5. Matrix of Academic Standards (Program Outcomes POs) with Courses

Compulsory Courses (Name and code)		Academic Standards (Mention code only)																	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3	C4
BAS011	Engineering Mathematics 1	✓			✓					✓										
BAS021	Engineering Physics 1	✓	✓																	
BAS031	Engineering Mechanics 1	✓		✓																
ENG011	Principles of Manufacturing Engineering	✓																		
ENG021	Engineering Drawing & Projection	✓																		
GEN011	English Language								✓											
BAS012	Engineering Mathematics 2	✓	✓								✓		✓							
BAS022	Engineering Physics 2	✓	✓																	
BAS032	Engineering Mechanics 2	✓		✓																
GEN051	Computer Skills								✓		✓									
GEN021	History of Engineering & Technology				✓			✓												
BAS041	Engineering Chemistry	✓	✓																	
GEN041	Human Rights						✓	✓												
ENG041	Basic Training								✓											
BAS111	Engineering Mathematics 3	✓	✓																	
BAS112	Discrete Mathematics	✓	✓	✓																
ELE121	Solid State Electronics	✓											✓	✓						

Compulsory Courses (Name and code)		Academic Standards (Mention code only)																	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3	C4
ELP111	Electrical Circuits	✓	✓									✓	✓							
ELC121	Programming and system representation								✓		✓									
ENG141	Technical Report Writing		✓																	
BAS113	Ordinary Differential equations	✓										✓								
ELE111	Electronic Testing (1)		✓		✓										✓	✓				
BAS114	Complex Analysis	✓	✓																	
ELE112	Electrical Measurements and sensors	✓	✓										✓		✓					
ELC111	Digital Design	✓											✓			✓				
ENG142	Specialized training		✓						✓					✓						
BAS211	Partial differential equations	✓											✓							
ELE241	Electromagnetic fields	✓											✓	✓						
ELC221	Object-Oriented Programming								✓		✓									
ELC211	Computer Organization	✓											✓			✓				
BAS212	Statistics & Probability Theory	✓	✓																	
ENG231	Contracts and legislation						✓													
BAS213	Operational Research	✓	✓	✓			✓													
BAS214	Numerical Methods	✓										✓								
ELE261	Signal Analysis	✓		✓									✓							
ELE221	Electronic circuits	✓	✓										✓	✓						
ELC261	Automatic Control	✓		✓			✓							✓						

Compulsory Courses (Name and code)		Academic Standards (Mention code only)																		
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3	C4
ENG241	Field training						✓	✓												
ELE331	Integrated Circuits Design			✓										✓					✓	✓
ELE341	Electromagnetic Waves	✓												✓			✓			
ELC311	Microprocessors	✓											✓					✓		
ELC331	Computer Networks													✓		✓	✓		✓	
ELP311	Energy Conversion	✓			✓							✓								
ELE351	Communication Systems	✓	✓										✓				✓			
ELE342	Microwave Engineering				✓	✓								✓			✓			
ELP312	Electric Power and Machines	✓			✓							✓								
ELE312	Electronic Testing (2)		✓	✓											✓			✓		
GEN351	Research and Analysis Skills					✓				✓	✓									
ENG341	Vocational training				✓		✓								✓	✓				
ELE451	Digital Communications	✓	✓										✓				✓			
ELE461	Digital Signal Processing	✓		✓										✓		✓	✓		✓	
ENG411	Environmental Impact of Projects				✓		✓							✓						
ELE471	Project (1)		✓	✓			✓	✓			✓						✓			
ELE445	Antennas and Wave Propagation	✓				✓							✓				✓			
ELE456	Wireless and Optical Communications	✓		✓									✓				✓			
GEN431	Energy, Water and Climate Change Issues			✓	✓		✓					✓								
ENG431	Monitoring & Quality Control Systems				✓		✓													

Compulsory Courses (Name and code)		Academic Standards (Mention code only)																	
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3	C4
ELE472	Project (2)		✓		✓		✓			✓				✓			✓	✓		

- **Elective Courses:**

Compulsory Courses (Name and code)		Academic Standards (Mention code only)																		
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3	C4
GEN15X	Elective Course (1)							✓		✓	✓									
GEN15y	Elective Course (2)							✓		✓	✓									
ENG21x	Elective Course (3)	✓						✓						✓						
ENG21y	Elective Course (4)	✓						✓						✓						
ENG33x	Elective course (5)				✓		✓													
ENG33y	Elective course (6)						✓			✓										
ELE32z	Elective course (7)			✓									✓				✓			
ELE44x	Elective course (8)						✓							✓				✓		
ELC47y	Elective course (9)			✓	✓		✓										✓			

6. Teaching and Learning strategies/methods to achieve Program Outcomes:

1. Face to face lectures\tutorials.
2. Blended Learning (Synchronous\Asynchronous sessions)
3. Active Learning (Interactive Discussions - Case studies -Brainstorming – Presentations)
4. Self-learning.
5. Flipped classroom.
6. Problem-based learning
7. Project-based learning
8. Experimental Learning (Practical lab. /Simulation)

7. Student Assessment strategies/methods to verify and ensure students' acquisition of Program Outcomes:

1. Proctored exams: Midterm & Final Exam (Electronic Examination - Written Examination)
2. Oral and Practical Exams
3. Quizzes
4. Assignments and Reports
5. Project applied on a practical field problem
6. Formative Assessment

8. Program Key Performance Indicators (if any)

No.	Performance Indicator	Target Level	Method	Measurement
1.	Graduation /completion rate	≥95%	Student results	End-of-year results report
2.	Overall Student Success Rate	≥95%	Student results	End-of-year results report
3.	Student satisfaction with the program	≥90%	Student satisfaction survey	End-of-year survey analysis
4.	Graduates' level of satisfaction with the academic program	≥90%	Graduates' Satisfaction Survey	Graduate follow-up survey reports

No.	Performance Indicator	Target Level	Method	Measurement
5.	Employers' satisfaction with graduates' competencies	≥85%	Employer Surveys	Labor market feedback survey analysis
6.	Faculty satisfaction with the program	≥95%	Faculty Members Surveys	Faculty evaluation survey reports

Program Coordinator

Dr/ Ibrahim Elmetwally Ramadan

Vice Dean for Education and Student Affairs

Prof. Dr/ Bishri Abdelmoamen