Program Specification

(2025-2026)

1. Basic Information

ProgramTitle:	Communications and Electronics Engineering Program
Total number of hours of the program:	269
Number of academic levels (expected program duration):	5 Years
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 hours	Percentage from the total number of hours
University Requirements		9	21	7.81%
Faculty/College Requirements (if applicable)		19	78	28.99%
Program Requirements		39	160	59.48%
Requirements of the majors/ divisions/ tracks/ specializations in the final year (if any)		-	-	-
Other requirements	Field Training	1	0	0%
	Graduation Project	2	10	3.72%
	Mandatory training year	1	0	0%
	Other (Vocational Training)	-	-	-
Total Compulsory Courses		64	249	92.57%
Elective Courses		5	20	7.43%
Total		69	269	100%

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

Academic Year	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of hours	Number of Weekly Hours		
							Theoretical	Exercises	Practical
Preparatory Year	1st Semester	BAS 0111	Engineering Mathematics 1	Compulsory	Institute	6	4	2	0
Preparatory Year	1st Semester	BAS 0112	Engineering Physics 1	Compulsory	Institute	7	4	2	1
Preparatory Year	1st Semester	BAS 0113	Engineering Mechanics 1	Compulsory	Institute	4	2	2	0
Preparatory Year	1st Semester	BAS 0114	Engineering Chemistry	Compulsory	Institute	4	2	1	1
Preparatory Year	1st Semester	MED 0115	Engineering Drawing & Projection	Compulsory	Institute	4	1	3	0
Preparatory Year	1st Semester	HUM 0116	Computer Skills	Compulsory	University	3	1	-	2
Preparatory Year	2nd Semester	BAS 0121	Engineering Mathematics 2	Compulsory	Institute	6	4	2	0
Preparatory Year	2nd Semester	BAS 0122	Engineering Physics 2	Compulsory	Institute	6	4	1	1
Preparatory Year	2nd Semester	BAS 0123	Engineering Mechanics 2	Compulsory	Institute	4	2	2	0
Preparatory Year	2nd Semester	MED 0124	Principles of Manufacturing Engineering	Compulsory	Institute	4	2	0	2
Preparatory Year	2nd Semester	MED 0125	Engineering Drawing & Projection	Compulsory	Institute	4	1	3	0
Preparatory Year	2nd Semester	HUM 0126	History of Engineering & Technology	Compulsory	University	2	2	0	0
Preparatory Year	2nd Semester	HUM 0127	English Language	Compulsory	University	2	0	2	0
1st Year	1st Semester	BAS 1411	Engineering Mathematics (3)	Compulsory	Major	6	4	2	-
1st Year	1st Semester	ELE 1412	Solid States	Compulsory	Institute	4	2	2	-
1st Year	1st Semester	ELP 1413	Electrical Circuits (1)	Compulsory	Institute	4	2	2	-
1st Year	1st Semester	ELC 1414	Computer Programming (1)	Compulsory	Major	4	2	-	2
1st Year	1st Semester	CIV/MEC 1415	Civil and Mechanical Engineering	Compulsory	Institute	4	2	2	-
1st Year	1st Semester	HUM 1416	Technical Report Writing	Compulsory	Institute	2	-	2	-

Academic Year	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of hours	Number of Weekly Hours		
							Theoretical	Exercises	Practical
1st Year	1st Semester	HUM 1227	Communication & Presentation Skills	Compulsory	University	4	2	-	2
1st Year	2nd Semester	BAS 1421	Engineering Mathematics (4)	Compulsory	Major	6	4	2	-
1st Year	2nd Semester	ELE 1422	Basic Electronics	Compulsory	Major	4	2	2	-
1st Year	2nd Semester	ELP 1423	Electrical Circuits (2)	Compulsory	Institute	4	2	2	-
1st Year	2nd Semester	ELP 1424	Electrical Measurements (1)	Compulsory	Major	4	2	1	1
1st Year	2nd Semester	ELE 1425	Logic Circuits (1)	Compulsory	Major	4	2	1	1
1st Year	2nd Semester	ELC 1426	Computer Applications	Compulsory	Major	4	2	-	2
1st Year	2nd Semester	HUM 1427	Energy, water and climate change issues	Compulsory	University	2	2	-	-
2nd Year	1st Semester	BAS 2411	Engineering (5Mathematics)	Compulsory	Major	4	2	2	-
2nd Year	1st Semester	ELP 2412	Electromagnetic fields	Compulsory	Major	4	2	2	-
2nd Year	1st Semester	ELE 2413	Logic Circuits (2)	Compulsory	Major	4	2	1	1
2nd Year	1st Semester	ELC 2414	Computer Programming (2)	Compulsory	Major	4	2	-	2
2nd Year	1st Semester	ELE 2415	Electronics Engineering	Compulsory	Major	4	2	2	-
2nd Year	1st Semester	ELP 2416	Electrical Measurements(2)	Compulsory	Major	4	2	1	1
2nd Year	1st Semester	HUM 2417	Principles of Negotiation	Compulsory	University	2	2	-	-
2nd Year	1st Semester	BAS 2421	Engineering (6Mathematics)	Compulsory	Major	4	2	2	-
2nd Year	2nd Semester	ELE 2422	Signal Analysis	Compulsory	Major	4	2	2	-
2nd Year	2nd Semester	ELC 2423	Computer Organization & Architecture (1)	Compulsory	Major	4	2	2	-
2nd Year	2nd Semester	ELE 2424	Electronic Testing (1)	Compulsory	Major	4	1	-	3
2nd Year	2nd Semester	ELC 2425	Automatic Control	Compulsory	Major	4	2	1	1

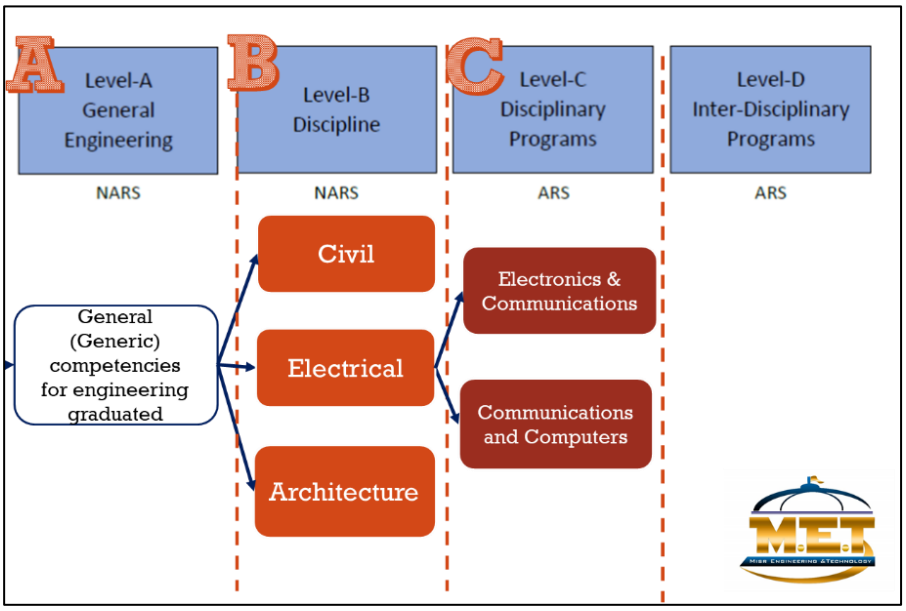
Academic Year	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of hours	Number of Weekly Hours		
							Theoretical	Exercises	Practical
2nd Year	2nd Semester	BAS 2426	Statistics& Probability Theory	Compulsory	Major	2	1	1	-
2nd Year	2nd Semester	HUM 2427	Introduction to Accounting	Compulsory	Institute	3	2	1	-
3rd Year	1st Semester	ELE 3411	Communication Systems (1)	Compulsory	Major	4	2	2	-
3rd Year	1st Semester	ELE 3412	Electromagnetic Waves	Compulsory	Minor	4	2	2	-
3rd Year	1st Semester	ELE 3413	Electronic Circuits	Compulsory	Major	4	2	2	-
3rd Year	1st Semester	ELC 3414	Microprocessors & Applications	Compulsory	Minor	4	2	2	-
3rd Year	1st Semester	ELP 3415	Energy Conversion	Compulsory	University	4	2	2	-
3rd Year	1st Semester	ELE 3416	Elective course (1)	Elective	Minor	4	2	2	-
3rd Year	1st Semester	HUM 3417	Engineering Economic	Compulsory	University	2	2	-	-
3rd Year	2nd Semester	ELE 3421	Communication Systems (2)	Compulsory	Minor	4	2	2	-
3rd Year	2nd Semester	ELC 3422	Computer Networks	Compulsory	Major	4	2	2	-
3rd Year	2nd Semester	ELP 3423	Electric Power and Machines	Compulsory	Institute	4	2	2	-
3rd Year	2nd Semester	ELE 3424	Integrated Circuits Design	Compulsory	Minor	4	2	-	2
3rd Year	2nd Semester	ELE 3425	Electronic Testing (2)	Compulsory	Major	4	1	-	3
3rd Year	2nd Semester	ELE 3426	Elective course (2)	Elective	Minor	4	2	2	-
3rd Year	2nd Semester	HUM 3427	Business Administration	Compulsory	Institute	2	2	-	-
4th Year	1st Semester	ELE 4411	Antenna & Wave Propagation	Compulsory	Minor	4	2	2	-
4th Year	1st Semester	ELE 4412	Optical Communications	Compulsory	Minor	4	2	2	-
4th Year	1st Semester	ELE 4413	Digital Signal Processing	Compulsory	Minor	4	2	2	-
4th Year	1st Semester	ELE 4414	Elective course (3)	Elective	Minor	4	2	2	-
4th Year	1st Semester	ELE 4415	Elective course(4)	Elective	Minor	4	2	2	-

Academic Year	Semester	Course Code	Course Title	Course Type (Compulsory / Elective)	Requirement Category/ Type	Number of hours	Number of Weekly Hours		
							Theoretical	Exercises	Practical
4th Year	1st Semester	ELE 4416	Project (1)	Compulsory	Minor	5	1	4	-
4th Year	1st Semester	HUM 4417	Human Rights	Compulsory	University	2	2	-	-
4th Year	2nd Semester	ELE 4421	Digital Communication Systems	Compulsory	Minor	4	2	2	-
4th Year	2nd Semester	ELE 4422	Electronic Testing (3)	Compulsory	Minor	4	1	-	3
4th Year	2nd Semester	ELE 4423	RADAR Systems	Compulsory	Minor	4	2	2	-
4th Year	2nd Semester	ELE 4424	Satellite Communications	Compulsory	Minor	4	2	2	-
4th Year	2nd Semester	ELE 4425	Elective course(5)	Elective	Minor	4	2	2	-
4th Year	2nd Semester	ELE 4426	Project (2)	Compulsory	Minor	5	1	-	4
4th Year	2nd Semester	HUM 4327	Professional Ethics	Compulsory	University	2	2	-	-

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	**B.3**	Design and implement: elements, modules, sub-systems or systems in electrical/electronic/digital

National Academic Reference Standards (NARS)		Academic Reference Standards (ARS)	
Code	**Text**	**Code**	**Text**
	electrical/electronic/digital engineering using technological and professional tools.		engineering using technological and professional tools.
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
BAS 0111	Engineering Mathematics 1	•																		
BAS 0112	Engineering Physics 1	•	•																	
BAS 0113	Engineering Mechanics 1	•																		
BAS 0114	Engineering Chemistry	•	•																	
MED 0115	Engineering Drawing & Projection 1	•																		
HUM 0116	Computer Skills								•		•									
BAS 0121	Engineering Mathematics 2	•																		
BAS 0122	Engineering Physics 2	•	•																	
BAS 0123	Engineering Mechanics 2	•																		
MED 0124	Principles of Manufacturing Engineering	•	•																	
MED 0125	Engineering Drawing & Projection 2	•																		
HUM 0126	History of Engineering & Technology				•			•			•									
HUM 0127	English Language								•											
BAS 1411	Engineering Mathematics 3	•																		
ELE 1412	Solid States	•											•	•						
ELP 1413	Electrical Circuits (1)	•	•									•	•							
ELC 1414	Computers Programming (1)	•												•						

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
CIV/MEC 1415	Civil and Mechanical Engineering	•		•	•															
HUM 1416	Technical Report Writing								•											
HUM 1227	Communication & Presentation Skills							•	•	•										
BAS 1421	Engineering Mathematics 4	•	•	•																
ELE 1422	Basic Electronics	•											•							
ELP 1423	Electrical Circuits (2)	•	•									•	•							
ELP 1424	Electrical Measurements (1)	•	•										•		•					
ELE 1425	Logic Circuits (1)	•											•			•				
ELC 1426	Computer Applications	•		•										•						
HUM 1427	قضايا الطاقة والمياه وتغير المناخ			•	•		•					•								
BAS 2411	Engineering Mathematics 5	•	•	•																
ELP 2412	Electromagnetic fields	•											•	•						
ELE 2413	Logic Circuits (2)	•					•						•			•				
ELC 2414	Computer Programming (2)	•		•										•						
ELE 2415	Electronics Engineering	•	•										•	•						
ELP 2416	Electrical Measurements (2)	•	•												•					
HUM2417	Principles of Negotiation							•	•	•	•									
BAS 2421	Engineering Mathematics 6	•	•											•						
ELE 2422	Signal Analysis	•		•									•							
ELC 2423	Computer Organization & Architecture (1)	•											•	•						

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
ELE 2424	Electronic Testing (1)		•		•										•	•				
ELC 2425	Automatic Control	•		•			•							•						
BAS 2426	Statistics& Probability Theory	•	•						•						•					
HUM 2427	Introduction to accounting									•										
ELE 3411	Communication Systems (1)	•	•										•				•			
ELE 3412	Electromagnetic Waves	•												•			•			
ELE 3413	Electronic Circuits													•	•			•		•
ELC 3414	Microprocessors & Applications			•										•						
ELP 3415	Energy Conversion	•		•	•							•								
HUM 3417	Engineering Economic			•	•					•										
ELE 3421	Communication Systems (2)	•	•											•			•			
ELC 3422	Computer Networks													•		•	•		•	
ELP 3423	Electric Power and Machines	•			•							•								
ELE 3424	Integrated Circuits Design			•										•					•	•
ELE 3425	Electronic Testing (2)		•			•									•			•	•	
HUM 3427	Business Administration						•			•	•									
ELE 4411	Antenna & Wave Propagation	•				•							•				•			
ELE 4412	Optical Communications	•		•									•				•			
ELE 4413	Digital Signal Processing	•		•										•		•	•		•	
ELE 4416	Project (1)		•	•			•	•			•						•			

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
HUM 4417	Human rights				•			•												
ELE 4421	Digital Communication Systems	•	•										•				•			
ELE 4422	Electronic Testing (3)		•	•											•			•		
ELE 4423	RADAR Systems	•	•										•				•			
ELE 4424	Satellite Communications	•			•								•				•			
ELE 4426	Project (2)		•		•		•			•				•			•	•		
HUM 4327	Professional Ethics						•	•												

- **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
ELE 3416	Elective course 1						•							•				•		
ELE 3426	Elective course 2			•									•				•			
ELE 4414	Elective course 3			•	•		•													
ELE 4415	Elective course 4					•											•	•		
ELE 4425	Elective course 5				•	•								•			•			

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	≥87%	Student satisfaction survey	End-of-year survey analysis
4.	Graduates' level of satisfaction with the academic program	≥85%	Graduates' Satisfaction Survey	Graduate follow-up survey reports

No.	Performance Indicator	Target Level	Method	Measurement
5.	Employers' satisfaction with graduates' competencies	≥83%	Employer Surveys	Labor market feedback survey analysis
6.	Faculty satisfaction with the program	≥90%	Faculty Members Surveys	Faculty evaluation survey reports

Program Coordinator

Dr/ Ibrahim Elmetwally Ramadan

Vice Dean for Education and Student Affairs

Prof. Dr/ Bishri Abdelmoamen