



كلية الهندسة - جامعة قناة السويس

برنامج هندسة القوى والآلات الكهربائية

Electrical Power and Machines Engineering program

Program report
(2024-2025)



كلية الهندسة - جامعة قناة السويس

برنامج هندسة القوى والآلات الكهربائية

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Basic Information

▪ Program title: Electrical Power and Machines Engineering
▪ Program type: Single
▪ Department offering the program: Electrical Engineering department
▪ Co-coordinator: Dr. Ahmed M. Ismaiel
▪ External evaluators:
▪ Year of operation: 2024/2025

1. Professional Information

2.1. Statistics

- Our graduate students at 2024/2025 were specialized in Electrical Power and Machines program after the third level according to the faculty regulation 2008. The first level is a preparatory year for all students admitted to the faculty. The second and third level are for the general courses of electrical engineering department. No. of students starting the program at the fourth level (admitted at 2023-2024) is: 91

Table (1): No. and percentage of students passing in each year/level/semester

Year		Number of students	No of passing Students	Percentage of passing students
Level 4	2023-2024	91	91	100%
Level 5	2024-2025	80	80	100%

- No. of students completing the program and as a percentage of those who started: 80/ 91
- Grading: No. and percentage in each grade

Academic year	Number
students joining the program on Sept 2023	54
students completing the program in Jan 2025	3
students completing the program in May 2025	72
students completing the program in Sep 2025	5
Total Number of students completing the program at 2024-2025	80

No. and percentage of students passing in each grade -5th level

Year	Excellent (A, A-)		V.good (B+, B, B-)		Good (C+, C, C-)		Pass (D+, D)		Failed (F, Fr)	
	No.	%	No.	%	No.	%	No.	%	No.	%
5 th level 2025-2026 (80)	4	5%	40	50%	34	42.5%	2	2.5%	0	0%

2.2. Academic Standards

2.2.1. Achievement of program intended learning outcomes, LO's

1st level

Course Code	Course Name	Engineering Competencies (2018)										"Department" Electrical Engineering Competencies (NARS)					"Disipline" Electrical Power and Machines Competencies (ARS)		
		A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	B 1	B 2	B 3	B 4	B 5	C 1	C 2	C3
BSM 011	Physics (1)	X	X						X										
BSM 012	General chemistry	X	X						X										
BSM 013	Mathematics (1)	X		X		X													
BSM 014	Mechanics (1)	X		X					X		X								
BSM 015	production technology	X		X	X														
BSM 022	Computer applications in engineering		X		X					X									
BSM 021	Physics (2)	X	X		X														
BSM 023	Mathematics (2)	X		X		X													
BSM 024	Mechanics (2)			X			X				X								
BSM 025	Engineering drawing and projection			X	X		X			X									

2nd level Electrical Engineering

Course Code	Course Name	Engineering Competencies (2018)										"Department" Electrical Engineering Competencies (NARS)					"Displine" Electrical Power and Machines Competencies (ARS)		
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3
ELC 101	Mathematics (3)	X		X		X													
ELC 102	Physics (3)		X					X			X								
ELC 103	Electric Circuits (1)						X	X			X								
ELC 104	Logic Circuits (1)						X						X	X					
ELC 105	Computers and Programming				X			X					X			X			
ELC 106	Mathematics (4)	X		X		X													
ELC 107	Electric Materials						X					X	X						
ELC 108	Electric Circuits (2)		X					X					X						
ELC 109	Energy Conversion Basics		X									X		X	X				
ELC 110	Civil Engineering		X							X	X								

3rd level Electrical Engineering

Course Code	Course Name	Engineering Competencies (2018)										"Department" Electrical Engineering Competencies (NARS)					"Displine" Electrical Power and Machines Competencies (ARS)		
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3
ELC 211	Mathematics (5)	X		X		X													
ELC 212	Electronic Engineering												X	X	X				
ELC 213	Electrical Instrumentations Measurements							X	X					X	X	X			
ELC 214	Electromagnetic Fields						X					X	X		X				
ELC 215	Electric Power (1)											X	X		X				
ELC 216	Mathematics (6)	X		X		X													
ELC 217	Computer Architecture				X									X	X				
ELC 218	Electrical Machines (1)											X	X		X				
ELC 219	Electronic Circuits (1)		X										X	X	X				
ELC 220	Mechanical Engineering		X						X	X									

4th level Electrical Power and Machines engineering

Course Code	Course Name	Engineering Competencies (2018)										"Department" Electrical Engineering Competencies (NARS)					"Displine" Electrical Power and Machines Competencies (ARS)		
		A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A 10	B 1	B 2	B 3	B 4	B 5	C 1	C 2	C 3
EPM 321	Signal processing												X	X		X			
EPM 322	Electrical Machines (2)													X		X		X	
EPM 323	High Voltage Engineering												X			X		X	X
EPM 324	Automatic Control													X	X		X		
EPM 325	Power Electronics													X	X		X		
EPM 328	Electric Power 2														X			X	X
EPM 329	Protection and Switchgear Engineering 1													X		X		X	X
	Elective course 1														X		X	X	
	Elective course 2														X		X	X	
	Elective course 3														X		X	X	

5th level Electrical Power and Machines engineering

Course Code	Course Name	Engineering Competencies (2018)										"Department" Electrical Engineering Competencies (NARS)					"Disipline" Electrical Power and Machines Competencies (ARS)		
		A 1	A 2	A 3	A 4	A 5	A 6	A 7	A 8	A 9	A10	B 1	B 2	B 3	B 4	B 5	C 1	C 2	C3
EPM 326	Electric Tests 1														X	X	X		X
EPM 327	Electric Tests 2															X		X	X
EPM 330	Electric Power 3													X				X	X
EPM 331	Control of Electrical Machines														X	X		X	X
	Elective course 4														X		X	X	
	Elective course 5														X		X	X	
	Elective course 6														X		X	X	
	Elective course 7														X		X	X	

Course Code	Course Name	Engineering Competencies (2018)										"Department" Electrical Engineering Competencies (NARS)					"Displine" Electrical Power and Machines Competencies (ARS)		
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	C1	C2	C3
EPM 438	Graduation Project																X	X	X

Regarding the previous table we observe the achievement of the program intended learning outcomes to be covered by all courses taught:

- **Comments of external evaluator and other stakeholders**

- a. **Comments of stakeholders**

The courses of the Electrical Power and Machines engineering program are sufficient to enhance the skills of the graduates to cope with the job market requirements.

2.3. Achievement of program aims

The programs aim as stated in the program's objectives has been achieved with Contribute the society needs from Electrical Power and Machines engineering by graduating engineerings have applicable and basic sciences and practical skills, by training, alumina questionnaire, elective courses and graduation projects we observed totally achievement of program aims which are:

1. Work efficiently and effectively in many areas of Electrical Power and Machine Engineering Practice (PEO1).
2. Advance to a leadership and management position in their profession (PEO2).
3. Follow the professional development through self-learning and qualification for advanced professional and scientific degrees (PEO3).
4. Identify, analyze, and solve practical problems, making use of appropriate engineering tools and techniques (PEO4).
5. Work with contemporary laboratory instrumentation, design and perform experiments, and analyze and interpret the results (PEO5).
6. Communicate effectively through speaking, writing, and using graphics, functioning collaboratively within multi-disciplinary problem-solving teams (PEO6).
7. Adapt successfully to changing technologies and apply their skills in new contexts to meet the demands of society (PEO7).

Commentary (quoting evaluations from the external evaluator and other stakeholders)

The assessment methods used in the program courses were as following:

1. Written Exams (class exams, mid-term, and final exam)
2. Practical exams especially for Lab courses

3. Oral exams for the project, Lab courses, and some other courses
4. Written reports
5. Project applied on a practical field problem

The current assessment methods of the program courses are considered quite appropriate. These methods measure the program ILO's with reasonable accuracy.

2.4. Student achievement

Graduated Students achievement through the program

Students passing percentage	
Year	Percentage
4 th level (2022- 2023)	100%
5 th level (2023- 2024)	100%

The percentage of students completing the programs and graduating this year as referred to the admitted students is around 100 %, which is considered a good achievement.

The destinations of the program's graduates are, however, not now yet. However, it seems that market demand nowadays is high for engineers. Most of them are attracting to the private sector for a good payment.

2.5. Quality of teaching and learning

Most of the teaching methods are still traditional since it depends mainly on the whiteboard. This may suit the nature of many courses that are highly dependent on analysis. However, for other courses that demonstrate descriptive information electronic learning techniques should be applied.

Self-learning methods related to the search of information, which can be achieved through library search, internet search, and field training, are still limited due to some reasons, which are attributed to limited access to the internet in computer labs.

Moreover, the limitation of using such learning tools can be attributed to several factors among them no access to the EULC website and to some extent to the weak interest of students due to lack of motivation.

2.6. Effectiveness of student support systems

Commentary on both academic and pastoral/personal support for all students

The department is interested in the students' support through the following:

- A system was developed to solve the problems of students through the distribution of the responsibility on the faculty members to quickly resolve the problem and follow-up the complaints and to respond in a specific period.



- The periodic meeting with students' representatives to quickly solve the problems of students.
- Students are helped in the case of special circumstances such as cases of the disease, the death of a parent, injuries during an incident, by taking into account the circumstances of each case in providing the requirements of this year, especially in materials that rely on semester marks and attendance.
- Encouraging high-grade (excellent and very good) students by giving them financial rewards.

2.7. Learning resources

A. No. and ratio of faculty members and their assistants to students

No. of students $54+121+111+57+69=412$

No. of program faculty members = 19

No. of program Faculty out posted members = 5

Total No of program members = 21.5

No. of program faculty member assistants = 5

No. of faculty members/No. of students = $21.5/412$ (about one faculty member for 19 students)

No. of faculty members and assistants/No. of students = $26.5/412$ (about one faculty member for 15.5 students)

B. Matching of faculty members' specialization to program needs

The faculty member's specialization matches the courses offered in the program.

C. Availability and adequacy of the program handbook

There is a handbook for all B.Sc. programs offered by the faculty, including study plans and courses' short description.

D. Adequacy of library facilities

The faculty library is adequate, due to adequate lighting, adequate ventilation, computerized search, stuffed in scientific periodic and journals, with enough recent textbook copies.

E. Adequacy of laboratories

- The department has Eight laboratories, which are:
 - Electrical circuits and measurements Lab.
 - Electrical machines Lab.
 - Solar energy Lab.
 - Electrical Power Lab.
 - Protection and Switchgear Lab.
 - Electrical installation Lab.
 - Renewable energy lab
 - Electrical power basic



F. Adequacy of computer facilities

The available computer labs are adequate. Internet access is now available for faculty staff and for students through a wireless network covering the building where the department rooms exist.

G. Adequacy of field/practical training resources

The field training is beneficial for students as there are scheduled visits training for several stations and factories.

H. Adequacy of any other program needs

Most of the lecture rooms are now equipped with data show.

2.8. Quality management

A. Availability of regular evaluation and revision system for the program

There are an evaluation and revision system for the program that is carried out through the update of the curriculum of the program every 5 years. This is based on the evaluation undertaken by the external evaluator.

B. Effectiveness of the system

There was no adequate and effective tool to evaluate the program.

The internal and external evaluator has newly adapted the evaluation system.

C. Effectiveness of Faculty and University laws and regulations for progression and completion

These laws and regulations are relatively effective from the perspective of program students.

D. Effectiveness of program external evaluation system

I. External evaluators

The External evaluator gives valuable notes.

II. Students

The students' evaluation was to some extent adequate and effective since this approach is relatively recent. However, there is no uniform methodology for distributing the evaluation forms. Moreover, the structure of the evaluation form needs enhancements .

III. Other stakeholders

The stakeholders give valuable evaluation and suggestions. However, the number and specialty of the considered stockholders are not sufficient to get a more practical and realistic evaluation.



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3. Proposals for program development

A. Program structure (units/credit-hours)

The program structure must contain the National Academy reference standards (NARS) as:

University requirements of 8% at least.

Faculty requirements of 20% at least.

General courses of 30% at least.

Specialized courses of 35% at most.

We need to justify the percentage of courses in each category to achieve the NARS rules.

B. Staff development requirements

The staff development is based on developing 3 main pillars , pedagogical skills training and development , technical skills training and development , research skills training and development .

For enriching research skills some main courses and aspects have to be considered such as :

1. **Scientific Writing:** Writing and publishing high-impact research papers.
2. **Grant Writing:** Securing funding for research projects.
3. **Data Analysis:** Advanced statistical methods and tools (e.g., SPSS, R, or Python).
4. **Research Ethics:** Conducting ethical research and understanding plagiarism policies.

4. Progress of previous year's action plan

Action	responsible person	Status
<ul style="list-style-type: none"> Using technical Videos in explanations. 	Faculty staff	Done Done Done Done

5. Action plan

Action	Completion Date	Person	Comment
IT support entity to offer technical guidance and help for students and staff members	2025-2026	IT members	
Adding more presentation videos to the content of the lectures		Faculty staff	
Inserting more animated videos to explain the physical attributes of the difficult topics		Faculty staff	
Inserting explanatory videos		Faculty staff	
Increasing virtual lap classes		Faculty staff	
Replacing audio systems		General secretary of the faculty	

Program Coordinator: Dr. Ahmed M. Ismaiel

Signature:

Ahmed Ismaiel