Ministry of Higher Education and Scientific Research
Scientific Supervision and Evaluation Authority
Department of Quality Assurance and Academic Accreditation

Guide Academic Program and Course Description

Introduction:

Based on the need to align educational outcomes with labor market requirements, this educational program was developed to effectively hone students' skills, while ensuring its quality through annual audits.

The academic description is the cornerstone of this program, defining its objectives, content, and acquired skills. It is an essential document for program accreditation. Faculty members prepare this description under the supervision of departmental academic committees.

This edition of the guide keeps pace with the latest developments in the Iraqi education sector, providing a detailed description of traditional programs and adopting new standards for describing academic programs, as stated in the Department of Studies circular dated May 3, 2023. We emphasize that accuracy in describing programs and courses is key to improving the quality of education.

Concepts and terms:

Academic program description: It is a comprehensive summary that accurately describes the program, its components, basic methods, and the objectives it seeks to achieve. This description also includes a detailed breakdown of the expected learning outcomes and how they will be achieved through specific educational strategies.

Course Description: It is a statement that outlines the key characteristics and outcomes a student should achieve upon successful completion of the course. This description aims to demonstrate the extent to which the student will benefit from the available learning opportunities and is directly linked to the academic program's vision, taking into account the program's future aspirations, focus, practical reality, and the applicability of what they have learned.

Program message: It clarifies the main objectives the program seeks to achieve, and the activities and procedures required to achieve these objectives. The mission also outlines the paths through which the program will be developed and its future directions.

Program objectives: These are specific statements that describe the results the program aims to achieve. These objectives must be measurable and observable, allowing for evaluation of the program's effectiveness.

Curriculum structure: It is the comprehensive organization of the courses included in the academic program according to the approved education system (whether semester, annual, or track-specific). This includes specifying the number of academic units (credit hours) for each course.

Learning outcomes: These are the knowledge, skills, and competencies a student acquires after successfully completing an academic program. Learning outcomes for each course must be defined to align with the overall program objectives.

Teaching and learning strategies: These are the methods and techniques used to develop student learning. These strategies encompass all classroom activities (inside the classroom) and extracurricular activities (outside the classroom) that aim to achieve specific educational objectives**.**

Academic Program Description Form

University name: Samarra University

College/Institute: College of Engineering

Scientific Department: Department of Electromechanical Engineering

Name of academic or professional program: Bachelor of Science in Electromechanical Engineering

Final certificate name: Bachelor of Electromechanical Engineering

Academic system: Bologna (1st ،2nd and 3rd), Semester (3rd and 4th)

Description preparation date: 1/9/2025

Date of filling out the file: 1/6/2026

signature:

Head of Department name:

Lect. Omar Mohammed Ahmed

date: 2026/6/7

signature:

Scientific Associate name:

Prof. Dr. Mohammed Asmail Eleiwi

Date: 7/6/2026

The file is checked by:

Division of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Division:

Date: 7/6/2026

Signature:

Approval of the Dean

Asst. Prof. Dr. Amjed Saleh Mahmood

/6/2026

1. Program vision

To emerge as a leading department in the field of electromechanical engineering, meeting the growing needs in its field of specialization, in order to be distinguished among reputable universities.

2. Program message

Preparing engineers and researchers in the field of electromechanical engineering at a distinguished level of knowledge, keeping pace with the rapid developments in this field, and adhering to professional ethics.

3. Program objectives

Graduating distinguished engineers with an understanding of various aspects of the electromechanical engineering sector and a sound foundation in the basic principles of design and engineering analysis of electromechanical systems.

4. Program accreditation

The program has no reliability.

5. Other external influences

Deanship of the College of Engineering

6. Program structure

Program structure	Number of courses	Study unit	percentage	comments
Institutional requirements	6	12	10%	There are two study systems in the department (Bologna and semester)
College requirements	8	16	13%	
Department requirements	34	92	74%	
Summer training	1	Not counted	2%	
Other (Graduation project)	1	4	1%	

7. Program description

Year/Level	Course code	Course name	Credit hours			Units
			theoretical	applied	practical	
First year / First semester Bologna	EME111	Thermodynamics	7		2	9
	EME112	Mathematics	8			9
	EME113	Computer Science	2		2	4
	EME 114	Engineering Physics	5			5
	EME115	Mechanical workshop	1		2	3
Total hours and units			23		6	30
First year / Second semester Bologna	EME121	Fundamentals of Electrical Engineering	6		2	9
	EME122	Engineering Mechanics	5		2	8
	EME123	Engineering Drawing and Auto CAD	3		3	6
	EME124	Electric workshop	1		3	4
	EME125	English Language I	3			3
Total hours and units			18		10	30

Second year / First semester Bologna	EME 211	Electronics	5		2	8
	EME212	Fluid Mechanics	5		2	8
	EME213	Strength of Materials	3		2	5
	EME214	C++ Language	1		2	4
	EME215	English Language II	3			3
	EME216	Crimes of Al Ba'ath Regime in Iraq	2			2
Total hours and units			19		8	30
Second year / Second semester Bologna	EME221	Electric circuits	5		2	8
	EME222	Theory of Machines	3		2	7
	EME223	Engineering Mathematics	6			6
	EME224	Programming (MATLAB)	1		2	4
	EME225	Arabic Language	2			3
	EME226	Human Rights and Democracy	2			2
Total hours and units			19		6	30
Third year / First semester Bologna	EME 311	Heat Transfer	4		1	4
	EME312	Electrical Machines DC & AC	4		2	5
	EME313	Vibration	3		1	4
	EME314	Air Conditioning	3		0	4
	EME315	Engineering Analysis	3		0	4
	EME 316	Analog Communications	3		1	4
	EME315	Turbomachinery	3		1	5
Total hours and units			24		6	30
	EME321	Digital communications	2			4

Third year / Second semester Bologna	EME322	Numerical Analysis	2		1	4
	EME323	English Language III	2		0	4
	EME324	Measurements and Devices	2		0	4
	EME325	Combustion	2		0	4
	EME326	Power and Protection Systems	3		1	6
	EME327	Microcontroller	3		2	4
Total hours and units			19		3	30
Third year / First semester	EME 311	Heat Transfer I	3		1	2.5
	EME 312	Electrical Machines (DC)	3		1	2.5
	EME 313	Vibration	3		1	2.5
	EME 314	Combustion	3		1	2.5
	EME 315	Fluid Machinery	3			2
	EME 316	Communications I	3		2	3
	EME 317	Engineering Analysis	3			2
	EME 318	Power Systems	3			2
Total hours and units						
Third year / Second semester	EME 321	Heat Transfer II	3		1	2.5
	EME 322	Electrical Machines (AC)	3		1	2.5
	EME 323	Air conditioning	3			2
	EME 324	Measurements and Devices	2			2
	C 325	English Language III	2			2
	EME 326	Communications II	3		2	3
	EME 327	Numerical Analysis	3			2
	EME 328	Protection Systems	3			2

Total hours and units						
Fourth year / First semester	EME 411	Power plants	3			2
	EME 412	Design of Machine Elements	3			2
	EME 413	Control I	3		2	3
	EME 414	Properties of engineering materials	3			2
	EME 415	High Voltage Engineering	3			2
	EME 416	Power Electronics	3			2
	EME 417	Communication Network	3			2
	C 408	Engineering Project	3			2
Total hours and units						
Fourth year / second semester	EME 421	EM Systems	2		2	3
	C 422	English Language VI	2			2
	EME 423	Control II	3		2	3
	EME 424	Manufacturing process	2			2
	EME 425	Renewable Energy	3		2	3
	EME 426	Power plants Operation and Maintenance	3			2
	EME 427	Industrial Engineering	**3**			**2**
	C 408	Engineering Project			4	4
Total hours and units						

8. Expected learning outcomes of the program
knowledge
Graduates will acknowledge the importance of continuous learning, demonstrate the ability to acquire and apply new knowledge as needed, and adopt appropriate learning strategies effectively member and leader in a team environment, establishing goals, planning tasks, and fostering a collaborative and inclusive working atmosphere.
Skills
Graduates will be capable of applying the engineering design process to develop solutions that address specific needs while considering public health and safety, as well as global, cultural, social, environmental, and economic factors relevant to the engineering discipline. and will possess the ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
values
Graduates will recognize their ethical and professional responsibilities in engineering practice and will make informed decisions that consider the broader implications of engineering solutions in global, economic, environmental, and societal contexts.

9. Teaching and learning strategies
General strategies and methods adopted to implement the program in general: 1 - Giving theoretical lectures using PowerPoint. 2 - Conduct laboratory experiments to apply concepts practically. 3 - Use of computer labs for training on programs and applications. 4 - Display video lectures to support educational content.

5 - Assign students group assignments to promote collaborative work.

10. Evaluation methods
1 - Midterm and final exams
2 - Daily short exams
3 - Reports and assignments

11. Faculty

Faculty members

Academic rank	Specialization		Special requirements/skills (if applicable)	Number of the Faculty Staff	
	general	Special		staff	lecturer
professor	Mechanical Eng.	thermal		1	
	Mechanical Eng.	applied		1	
Prof. Assistance	Mechanical Eng.	applied		1	
	Chemical Eng.	Chemical		1	
	Electrical Engineering	Communication Engineering		2	
Lecturer	Electrical Engineering	Network and Communication Engineering		1	
	Mechanical Eng.	Power		1	
	Mechanical Eng.	applied		2	
	Mechanical Eng.	Solar Energy		1	
	Civil Engineering	Construction		1	
	Computer Information Systems	Computer Information Systems		1	
Lect. Assistance	Electrical Engineering	Electrical Engineering		1	
	Electrical Engineering	Electronics and Communications Engineering		1	1
	Chemical Eng.	Chemical Eng.		3	

Professional development

Orientation of new faculty members

Professional development for faculty members

12. Acceptance criteria

I. **Determine the** capacity:

- The department first determines its "capacity" (the number of students that can be accommodated) based on its admissions plan and available staff (faculty and resources).
- This energy is then sent to the college deanship.
- From the deanship, you move to the university.
- Finally, it is sent to the Ministry of Higher Education and Scientific Research for official approval.

II. Central Student Admission:

- The Ministry of Higher Education and Scientific Research issues central admission decisions for students.
- Students are accepted based on their GPA and preferred choices.

II. College registration and student distribution:

- Once accepted, a student registers at the college. This is done through the Registration Division of the Deanship of the College of Engineering.
- Students must submit all required official documents during registration.
- Students are then distributed among the college's various departments. This distribution is based on:
  - Department capacity.
  - Student's desire.
- There is a provision that allows students to transfer from other departments to this specific department (here meaning the Department of Environmental Engineering, as will be mentioned later).

V. Registration in the Environmental Engineering Department:

- After the student's acceptance into the Environmental Engineering Department (specifically mentioned) is confirmed, he/she begins registration and begins attendance in this department.

13. The most important sources of information about the program
University Guide WebsiteFor the department: https://uosamarra.edu.iq/colleges-departments/Department-of-Electromechanical-Engineering/ University website: https://uosamarra.edu.iq

14. Program Development Plan
To Enhancing the quality of educationVanThe department has adopted the Bologna Process with the aim of achieving three main objectives: * Enhancing the quality of education: improving the level and quality of the educational process. * Raising graduate outcomes: improving the level of educational outcomes and the outcomes of graduating students. * Meeting the required competencies: ensuring that graduates possess the skills and knowledge (competencies) required by the labor market or subsequent academic fields. The Bologna system includes the European Credit Transfer and Accumulation System (ECTS).

15. Program Skills Map

Required learning outcomes of the program															
				knowledge				Skills				values			
year/Level	**Course code**	**Course name**	**Essential or optional ?**	**A1**	**A2**	**A3**	**A4**	**B1**	**B2**	**B3**	**B4**	**C 1**	**C 2**	**C 3**	**C 4**
First year / First semester	**EME111**	Thermodynamics		*											
	EME112	Mathematics		*											
	EME113	Computer Science		*											
	EME 114	Engineering Physics		*											
	EME115	Mechanical workshop		*											
First year / Second semester	**EME121**	Fundamentals of Electrical Engineering				*									
	EME122	Engineering Mechanics		*											
	EME123	Engineering Drawing and Auto CAD			*										
	EME124	Electric workshop				*									
	EME125	English Language I					*								
Second year / First semester	**EME 211**	Electronics				*									
	EME212	Fluid Mechanics		*											
	EME213	Strength of Materials		*											
	EME214	C++ Language			*										
	EME215	English Language II					*								
	EME216	Crimes of Al Ba'ath Regime in Iraq					*								
	EME221	Electric circuits				*									
	EME222	Theory of Machines		*											

Second year / Second semester	**EME223**	Engineering Mathematics		*											
	EME224	Programming (MATLAB)			*										
	EME225	Arabic Language				*									
	EME226	Human Rights and Democracy				*									
Third year / First semester	**EME 311**	Heat Transfer I			*										
	EME 312	Electrical Machines (DC)					*								
	EME 313	Vibration		*											
	EME 314	Combustion			*										
	EME 315	Fluid Machinery		*											
	EME 316	Communications I			*										
	EME 317	Engineering Analysis		*											
	EME 318	Power Systems				*									
Third year / Second semester	**EME 321**	Heat Transfer II		*											
	EME 322	Electrical Machines (AC)					*								
	EME 323	Air conditioning			*										
	EME 324	Measurements and Devices		*											
	C 325	English Language III					*								
	EME 326	Communications II				*									
	EME 327	Numerical Analysis		*											
	EME 328	Protection Systems					*								
Fourth year / First semester	**EME 411**	Power plants			*										
	EME 412	Design of Machine Elements		*											
	EME 413	Control I					*								
	EME 414	Properties of engineering materials				*									
	EME 415	High Voltage Engineering					*								
	EME 416	Power Electronics			*										
	EME 417	Communication Network					*								

	C 408	Engineering Project													
Fourth year / second semester	**EME 421**	EM Systems (REVIT MEP)		*											
	C 422	English Language VI					*								
	EME 423	Control II					*								
	EME 424	Manufacturing process													
	EME 425	Renewable Energy			*										
	EME 426	Power plants Operation and Maintenance					*								
	EME 427	Industrial Engineering													
	C 408	Engineering Project					*	*							