Program Catalogue | 2024-2025 |

Electromechanical Engineering Department

First Cycle — Bachelor degree (B.Sc.) – Electromechanical Engineering

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1. *Mission & Vision Statement:*

- ***Mission:***

Electromechanical Engineering Department is considering modern engineering disciplines that combine specialized Electrical and Mechanical Engineering, where Electromechanical Engineer deals with electrical equipment and systems for the operation of mechanical devices and these disciplines is an urgent need in the different industrial sectors. The mission of the department is to prepare specialists in the field of electromechanical engineering on a distinct level of knowledge and keep abreast of developments in the rapid development in this field and a commitment to professional ethics in work and society field.

- ***Vision:***

To be internationally recognized for the quality of the education offered, the relevance of its research, and the strength of its ethical values, yet one that serves the needs of the region and the Iraq in particular.

2. Program Specification:

Programme -code:	BSc-EME	**ECTS**	240
Duration:	4 levels, 8 Semesters	**Method of Attendance**	Full Time

The aim of the program is to graduate students capable to work as mechanical and electrical engineer in energy and renewable energies field. The engineering topics are divided into four parts; preliminary joint courses, mechanical courses, electrical courses and final joint courses.The program is offered in the day mode only. The program is comprised of on-campus, traditional lecture/laboratory courses. Almost all courses are delivered in the classroom or laboratory with the exception of two: (i) the Professional Experience course in which students are required to work during the summer of the third year at a company that offers professional engineering practice in their field of specialization. The work period covers a minimum of four weeks of full-time work, and (ii) the Project courses

where students are required to work independently, under the supervision of a faculty member in the program, on a final year project in their field of specialization.

Level 1 exposes students to the fundamentals of Engineering, suitable for progression to all programs within the Electromechanical Engineering programs group. Program-specific core topics are covered at Level 2 preparing for research-led subject specialist modules at Levels 3 and 4.

At Levels 2, 3 and 4 students are free to choose more than half of their module credits with the proviso a range of modules are selected that reflect the mechanical and electrical engineering to allows them to develop wide-ranging interests in the application of engineering through their education. students capable to work as mechanical and electrical engineer in energy and renewable energies field. The engineering topics are divided into four parts; preliminary joint courses, mechanical courses, electrical courses and final joint courses

3.Program Goals:

Objectives

The program offers only bachelor's degree in Electromechanical Engineering to satisfy the following educational objectives:

- Preparing engineers efficiently specialist in the field of Electromechanical Engineering and able to develop their skills in the fields of engineering knowledge.
- Apply engineering knowledge and skills to make positive impact on society through employment in industry, advanced study, and/or public services.
- Electromechanical Engineering graduates as professionals in the various fields of electromechanical engineering and known professional and ethical responsibilities in implementing sustainable engineering solutions.

4. Student Learning Outcomes:

The graduate of this department has the ability to use the integrated scientific principles that are shared with the other graduates from different engineering departments such as the use of scientific and technical hunch at the level of idea, production, mechanism, costs and the efficiency by using technology of information and materials, so he can do his role in design, researching, production, developing, planning and architectural details. He has the ability to keep up with new technologies that relate with his work, also has the ability to work with a group and to communicate with the other engineers from different fields.

Outcome 1

Math. And Physical science

The engineering science fundamentals and engineering design skills are built upon the basic mathematics and physical sciences. In the mathematics work our students have necessary tools for applications in analysis and design, Engineering Physics, the aims which can be achieved during teaching this program are concept of materials science, classification of materials, atomic structure and the type of bonding forces, types of materials and their applications and the mechanical material properties.

Outcome 2

Computer Science

Application of Advance Computer (MATLAB languages), Stress analysis with ANSYS& Electromechanical design with REVIT MEP.

Outcome 3

Engineering Drawing

Appling manual drafting and dimensioning of views, explains the principles of orthographic views, multi view projection and sectional view drawing.

Outcome 4

Engineering Mechanics, vibration

The aims to provide theoretical knowledge and principles of statics and Dynamics, vibration, illustration and discussion the principles of free & forced vibrations and definition, proceeding to the Student free & forced vibrations of single degree of freedom, illustration.

Outcome 5

Air conditioning, Thermodynamics

illustration and discussion the Main Theoretical Principles of Air conditioning and understanding of using different systems, Fundamental thermodynamic concepts including system, state, state postulate, equilibrium, process and cycle, Heat, work, 1st Law of Thermodynamics, Properties of a substance, Energy balances for idealized closed systems, Energy and mass balances for idealized control volumes, 2nd Law of Thermodynamics, Carnot cycles, thermal efficiencies, Entropy, isentropic processes, isentropic efficiencies, idealized power cycles.

Outcome 6

Fluid Mechanics, Heat Transfer, combustion

It provides a working knowledge of Fluid Mechanics and Illustration and discussion the principles of Principle of fluid motional flow classification, Heat Transfer teach theoretical basics of the conduction, convection and radiation heat transfer Coincided with a laboratory experiment, combustion to explain concept of various forms combustion process.

Outcome 7

strength of materials, machine elements, properties of engineering materials

The study of strength of materials often refers to various methods of calculating the stresses and strains in structural members, such as beams, columns, and shafts, machine elements: is aimed at integrating and applying prior knowledge in fundamental design, materials sciences, statics and dynamics coupled with design strategies and knowledge of machine elements to design various machines. These skills and knowledge help engineers to design, analyse, synthesize and deliver robust engineering solutions, engineering materials: engineers should have the knowledge of properties of engineering materials. The mechanical properties of a material are those which affect the mechanical strength and ability of material to be molded in suitable shape. Some of the typical mechanical properties of a material are included in this subject.

Outcome 8

Fundamentals of Electrical Engineering, More advanced electrical circuits, power systems

Illustration and discussion the fundamentals of electric engineering and definition for the DC/AC electrical circuits, series, parallel, series-parallel and identify the equations of voltages &current), advanced electrical circuits; we are often interested in communicating and transferring energy from one point to another which requires an interconnection of electrical devices. The course also includes the fundamentals of transient circuits, filters, three-phase circuits, and multi-port circuits, power systems, Giving Knowledge about the generation, transmission, and distribution systems. It also gives analysis about faults in power systems,

Outcome 9

Power Electronics, Electronics

Theoretical and practical experiments in the field of power electronics and electrical drives such as AC to DC converters (Rectifiers), DC to AC converters (invertors), DC to DC converters (DC choppers), AC to AC converters (AC voltage regulator and cyclo-converter), speed control of DC motors, and speed control of AC motors (inductions and synchronous motors), Electronics: Introduction to the basics of Electronics including diodes, principles of transistors, analysis of transistor circuits, multi-stage transistors, and applications of transistor circuits.

Outcome 10

Communications

Includes basics of signal analysis, fundamental analogue communications systems, analogue and digital modulation techniques, fundamental digital communications, coding/decoding.

5. Academic Staff:

Oras F. Khalaf | M. Sc. in Computer Engineering | Lecturer
Email: oras.fadil@uosamarra.edu.iq
Mobile no.: 07723447565

Ahmed M. Sana | M. Sc. in Electrical Engineering | Lecturer
Email: ahmed.sana@uosamarra.edu.iq
Mobile no.: 07706530330

Amjad Saleh Mahmoud | Ph.D. in Mechanical Engineering | Assistant Prof.
Email: dr.amjed.mahmood@uosamarra.edu.iq
Mobile no.:07732130096

Ehsan Ali Mustafa | Ph.D. in Mechanical Engineering | Lecturer
Email: ehsan.ali@uosamarra.edu.iq
Mobile no.: 07729056122

Eman Adel Mahmood | M.Sc. in Electrical Engineering | Assistant Lecturer
Email: eman.a.m@uosamarra.edu.iq
Mobile no.: 07813575148

Bakr Saeed Shehab | M.Sc. in Electrical Engineering | Assistant Lecturer

Email: bakrs1991@uosamarra.edu.iq
Mobile no.: 07708560910
Baraa A. Jassim | M.Sc. in Chemical Engineering | Assistant Lecturer
Email: baraa.a.jassim@uosamarra.edu.iq
Mobile no.: 07736722776

Reyad Azzawi Badr | Ph.D. in Mechanical Engineering | Assistant Prof.
Email: reyadh.azawi@uosamarra.edu.iq
Mobile no.: 07724826557

Zainab Abdul Majeed Khalaf | Ph.D. in Chemical Engineering | Lecturer
Email: Zainab.abd@uosamarra.edu.iq
Mobile no.: 07708357683

Sayf Waleed Majeed | M.Sc. in Electrical Engineering | Assistant Lecturer
Email: sayfwaleed93@gmail.com
Mobile no.: 07701021907

Shaymaa Husham AbdllMalek | Ph.D. in Mechanical Engineering | Lecturer
Email: shaymaa.h.ab@uosamarra.edu.iq
Mobile no.: 07717254981

Omar Mohamed Ahmed | M. Sc. in Mechanical Engineering | Lecturer
Email: omar.alzayat@uosamarra.edu.iq
Mobile no.: 07719998402

Mohammed Awaid atteaa | M. Sc. in Mechanical Engineering | Lecturer
Email: mohammedatteaa@uosamarra.edu.iq
Mobile no.: 07702951576

Muhammad Ismail Aliwi | Ph.D. in Mechanical Engineering | Prof.
Email: dr.muhammad@uosamarra.edu.iq
Mobile no.: 07703963354

Marwa Majeed Juma | M. Sc. in Chemical Engineering | Assistant Lecturer
Email: marwa.majeed@uosamarra.edu.iq
Mobile no.: 07709590503

Hadeel Abdulhadi Ibraheem | M. Sc. in Chemical Engineering | Assistant Lecturer
Email: hadeel.abdulhadi@uosamarra.edu.iq
Mobile no.: 07700672771

Waleed Khaled Ahmed | M. Sc. in Electrical Engineering | Assistant Lecturer
Email: Waleed.k.ah@uosamarra.edu.iq

Mobile no.: 07725059566

Younes Saud Alwan | M. Sc. in Electrical Engineering | Lecturer
Email: Younes.s.al@uosamarra.edu.iq
Mobile no.: 07733781520

Yahya Tariq Hussein | Ph.D. in Electrical Engineering | Lecturer
Email: yahya.t.hussein@uosamarra.edu.iq
Mobile no.:07702672301

Talha Jasim Ali | M.Sc. oil and gas Engineering | Assistant Lecturer
Email: talha.ja.a@uosamarra.edu.iq
Mobile no.: 07709236688

6. Credits, Grading and GPA:

Credits

Samarra University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree program number of ECTS is 240, 30 ECTS per semester. 1ECTS is equivalent to 25 hr student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the

GRADING SCHEME			
Group	**Grade**	**Marks الدرجة (%)**	**Definition**
Success Group (50 – 100)	A - Excellent	**(90 - 100)**	Outstanding Performance
	B - Very Good	**(80 - 89)**	Above average with some errors
	C - Good	**(70 - 79)**	Sound work with notable error
	D - Satisfactory	**(60 - 69)**	Fair but with major shortcoming
	E - Sufficient	**(50 - 59)**	Work meets minimum criteria
Fail Group (0 — 49)	FX -Fail	**(45 - 49)**	More work required but credit awarded
	F –Fail	**(0 - 40)**	Considerable amount of work required
Note			
Marks with decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above			

results a are independent of the students who failed a course. The grading system is defined as follows:

- Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by it ECTS, all are divided by the program total ECTS.
CGPA of a 4-year B.Sc. degrees:
CGPA = [(1st module score x ECTS) + (2nd module score x ECTS) + ……] / 240

7. Curriculum/Modules:

Semester* 1 | 30 *ECST* | 1 *ECST* = 25 *hr							
NO.	**Code**	**Module Title**	**SSWL**	**USSWL**	**ECTS**	**Type**	**Pre-request**
1	EME111	Thermodynamics	138	87	9	C	-
2	EME112	Mathematics	123	102	9	S	-
3	EME113	Computer Science	63	37	4	B	-
4	EME114	Engineering Physics	78	47	5	S	-
5	EME115	Mechanical workshop	48	27	3	S	-
TOTAL			**450**	**300**	**30**		
Semester* 2 | 30 *ECST* | 1 *ECST* = 25 *hr							
NO.	**Code**	**Module Title**	**SSWL**	**USSWL**	**ECTS**	**Type**	**Pre-request**
1	EME121	Fundamentals of Electrical Engineering	123	102	9	C	-
2	EME122	Engineering Mechanics	108	92	8	C	-
3	EME123	Engineering Drawing and Auto CAD	93	57	6	S	-
4	EME124	Electric workshop	63	37	4	S	-
5	EME125	English Language I	48	27	3	B	-
TOTAL			**435**	**315**	**30**		

Semester 3 | 30 ECST | 1 ECST = 25 hr							
NO.	**Code**	**Module Title**	**SSWL**	**USSWL**	**ECTS**	**Type**	**Pre-request**
1	EME 211	Electronics	108	92	8	C	-
2	EME212	Fluid Mechanics	108	92	8	C	-
3	EME213	Strength of Materials	78	47	5	C	-
4	EME214	C++ Language	48	52	4	S	-
5	EME215	English Language II	48	27	3	B	-
6	EME216	Crimes of Al Ba'ath Regime in Iraq	33	17	2	B	-
TOTAL			423	327	30		

Semester 4 | 30 ECST | 1 ECST = 25 hr							
NO.	**Code**	**Module Title**	**SSWL**	**USSWL**	**ECTS**	**Type**	**Pre-request**
1	EME221	Electric Circuits	123	77	8	C	-
2	EME222	Theory of Machines	78	97	7	C	-
3	EME223	Engineering Mathematics	93	57	6	S	-
4	EME224	Programming (MATLAB)	48	52	4	S	-
5	EME225	Arabic Language	33	42	3	B	-
6	EME226	Human Rights and Democracy	33	17	2	B	-
TOTAL			408	342	30		

8. Contact

Program Manager:
Lect. Oras Fadhil Khalaf
Email: oras.fadil@uosamarra.edu.iq
Mobile no.: 07723447565
Program Coordinator:
Dr.Eahea Tarik Huseen
Email: yahya.t.hussein@uosamarra.edu.iq
Mobile no.: 07702672301