

University of Al-Furat Al-Awsat (ATU)
Technical College/ Al-Mussaib (TCM)



جامعة الفرات الاوسط التقنية

الكلية التقنية / المسيب

*First Cycle – Bachelor's Degree (B.Sc.) – Machines
and Equipment's Engineering Techniques*

بكالوريوس - هندسة تقنيات المكنات والمعدات



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1. **Mission & Vision Statement**

Vision Statement

The Machines and Equipment's Engineering Techniques academic staff of the Technical College/ Al-Mussaib (TCM) at University of Al-Furat Al-Awsat (ATU) believe that students come to understand the discipline of Machines and Equipment's Engineering Techniques program is to empower students to become exceptional professionals. We bridge theory and practice, emphasizing hands-on experience and real-world challenges. Our goal is to foster innovation, entrepreneurship, and global perspectives. We prioritize lifelong learning and engage industry partnerships for relevance and professional growth. Ethics and values are central to our curriculum. We strive for research excellence, advancing knowledge and technology. Ultimately, our vision is to create engineers who make a positive impact on society through their skills and ethical practice in machines and equipment engineering.

Mission Statement

Our mission for the Bachelor's Degree in Machines and Equipment's Engineering Techniques program is to provide high-quality education that develops students into competent professionals. We aim to equip them with the technical skills and knowledge required for successful careers in the field. Fostering critical thinking and problem-solving abilities is integral to our mission, as we encourage students to analyze complex engineering challenges and develop innovative solutions. We strive to cultivate professionalism and ethical conduct, emphasizing integrity, responsibility, and respect. Collaboration and effective communication skills are nurtured through teamwork and communication exercises. Our commitment to continuous learning and professional development ensures that graduates remain updated and adaptable throughout their careers. Engaging industry partnerships ensures the relevance of our curriculum and prepares students for the job market. We encourage research and innovation, contributing to the advancement of knowledge and the development of industry solutions. In a supportive and inclusive learning environment, we promote diversity, equality, and inclusion, while also encouraging community service and sustainable practices.

2. Program Specification

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

The Bachelor's Degree (B.Sc.) in Machines and Equipment's Engineering Techniques program is designed to provide students with a comprehensive education in the field of machines and equipment engineering. The program is structured to be completed in four levels over eight semesters, with a total of 240 European Credit Transfer and Accumulation System (ECTS) credits.

Students enrolled in the program are expected to attend full-time, immersing themselves in the learning experience to maximize their understanding and skill development. The program incorporates a combination of theoretical knowledge, practical training, laboratory work, projects, and industry exposure to ensure a well-rounded educational experience.

Throughout the four levels and eight semesters, students will engage in a range of courses and modules covering topics such as engineering materials, crystal structure, thermal equilibrium diagrams, mechanical properties of metals, heat treatment of steel, and the study of various materials including metals, alloys, plastics, ceramics, glass, and composite materials.

The curriculum is carefully designed to provide a balanced blend of technical knowledge, problem-solving skills, professional ethics, and industry-relevant practices. Students will also have the opportunity to apply their learning through practical applications, internships, and real-world projects.

Upon successful completion of the program, students will be equipped with the necessary competencies and qualifications to pursue careers in the machines and equipment engineering industry. They will have a solid foundation in the fundamental principles of engineering, an understanding of materials and their properties, and the ability to analyze, design, and maintain machines and equipment effectively.

Overall, the B.Sc. in Machines and Equipment's Engineering Techniques program aims to produce graduates who are skilled, knowledgeable, and ready to contribute to the field of machines and equipment engineering, meeting the demands of the industry and driving technological advancements.

3. Program Objectives

- 1- Develop Technical Competence: Provide students with a strong foundation of technical knowledge, practical skills, and theoretical understanding in machines and equipment engineering.
- 2- Foster Problem-Solving Abilities: Cultivate students' critical thinking and problem-solving skills to enable them to analyze complex engineering challenges and develop innovative solutions.
- 3- Promote Professionalism and Ethical Conduct: Instill a strong sense of professionalism, ethical responsibility, and social awareness among students, preparing them to make ethical decisions and contribute positively to society.
- 4- Enhance Communication and Collaboration Skills: Foster effective communication and collaboration abilities in students, enabling them to work efficiently in multidisciplinary teams and effectively convey their ideas and solutions.
- 5- Encourage Lifelong Learning and Professional Development: Promote a culture of continuous learning and professional growth, empowering students to adapt to technological advancements and industry changes throughout their careers.
- 6- Bridge Theory and Practice: Provide students with hands-on experience, practical training, and industry exposure, ensuring the application of theoretical knowledge to real-world machines and equipment engineering challenges.

By achieving these program objectives, graduates of the program will be well-prepared to embark on successful careers in machines and equipment engineering, contribute to the industry's growth, and address the evolving needs of society.

4. Student Learning Outcomes

Upon completion of the Bachelor's Degree (B.Sc.) in Machines and Equipment's Engineering Techniques program, students will demonstrate a comprehensive understanding of machines and equipment engineering principles, theories, and practices. They will apply critical thinking and problem-solving skills to analyze and develop innovative solutions for complex engineering challenges. Students will exhibit professional competence, adhering to ethical standards and industry practices while ensuring the safety, reliability, and efficiency of engineering systems. Effective communication, collaboration, and adaptability in multidisciplinary teams will be demonstrated. Graduates will showcase a commitment to lifelong learning, continuously adapting to emerging technologies and industry trends. They will apply theoretical knowledge and practical skills to design, analyze, and maintain machines and equipment, integrating research, innovation, and sustainable practices. Leadership, management abilities, and a strong sense of professional ethics will be evident in their work.

Outcome 1

Technical Knowledge:

Possess a comprehensive understanding of machines and equipment engineering principles, theories, and practices, applying this knowledge to analyze and solve engineering problems effectively.

Outcome 2

Problem-Solving Skills:

Apply critical thinking and problem-solving techniques to identify, analyze, and develop innovative solutions for complex engineering challenges in the machines and equipment field.

Outcome 3

Professional Competence:

Demonstrate the ability to apply ethical standards and professional practices in machines and equipment engineering, ensuring the safety, reliability, and efficiency of engineering systems.

Outcome 4

Communication and Collaboration:

Effectively communicate engineering concepts, ideas, and solutions through written reports, oral presentations, and technical documentation. Collaborate efficiently in multidisciplinary teams, demonstrating strong interpersonal skills.

Outcome 5

Lifelong Learning:

Exhibit a commitment to continuous learning and professional development, staying abreast of advancements in machines and equipment engineering and adapting to emerging technologies and industry trends.

Outcome 6

Critical Thinking :

Graduates will be able to use critical-thinking and problem-solving skills to develop a research project and/or paper.

5. Academic Staff

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6. Credits, Grading and GPA

Credits

University of Al-Furat Al-Awsat (ATU) 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. 1 ECTS is equivalent to 25 hrs student workload, including structured and unstructured workload.

Grading

Before the evaluation, the results are divided into two subgroups: pass and fail. Therefore, the results are independent of the students who failed a course. The grading system is defined as follows:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	راسب - قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required
Note:				
Number 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.				

Calculation of the Cumulative Grade Point Average (CGPA)

1. The CGPA is calculated by the summation of each module score multiplied by its ECTS, all are divided by the program total ECTS.

CGPA of a 4-year B.Sc. degree:

$$\text{CGPA} = [(1^{\text{st}} \text{ module score} \times \text{ECTS}) + (2^{\text{nd}} \text{ module score} \times \text{ECTS}) + \dots] / 240$$

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU21011	Workshops (I)	93	10	4.00	B	
ATU21012	Engineering materials	93	57	6.00	B	
ATU21013	Mathematics (I)	78	74	6.00	B	
ATU21014	Engineering Mechanics(I)	93	107	8.00	C	
ATU21015	Engineering Drawing	63	37	4.00	B	
ATU21016	English Language (I)	36	14	2.00	S	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU21021	Workshops (II)	90	10	4.00	B	
ATU21022	Computer Aided Drafting (CAD)	78	72	6.00	B	
ATU21023	Mathematics (II)	93	57	6.00	B	ATU21013
ATU21024	Engineering Mechanics (II)	87	63	6.00	C	ATU21014
ATU21025	Computer Programming	63	37	4.00	B	
ATU11	Human Rights and Democracy	33	17	2.00	B	
ATU13	Arabic Language	31	19	2.00	B	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU21031	Strength of materials - Fundamentals	59	66	5.00	C	
ATU21032	Thermodynamics - Fundamentals	59	66	5.00	C	
ATU21033	Fluid Mechanics - Static	59	66	5.00	C	
ATU21034	Mathematics – Third Level	59	41	4.00	B	
ATU21035	Mechanical Engineering Drawing	45	30	3.00	S	

ATU21036	Manufacturing Processes	45	30	3.00	S	
ATU21037	Fundamental of Electricity	45	30	3.00	S	
ATUU211	BAATH CRIMES	31	19	2.00	B	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ATU21041	Strength of Materials - Application	59	66	5.00	C	
ATU21042	Thermodynamics - Applications	59	66	5.00	C	
ATU21043	Fluid Mechanics - Dynamics	59	66	5.00	C	
ATU21044	Industrial Automation	59	66	5.00	B	
ATU21045	Computer Aided Manufacturing (CAM)	59	66	5.00	B	
ATUU15	English Language (II)	17	33	2.00	S	
ATU21046	Computer Applications - Second Level	45	30	3.00	S	

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