University of Diyala

جامعة ديالى

First Cycle – Bachelor's degree (B.Sc.) – Mechanical Engineering

بكالوريوس – هندسة ميكانيكية

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1. Mission & Vision Statement

Vision Statement

The vision is to be a leading institution in producing highly competent mechanical engineers who excel in their careers and make meaningful contributions to society. We strive to be recognized globally for our academic excellence, innovative research, and commitment to the highest ethical standards. By continuously evolving our curriculum to align with industry trends and emerging technologies, we aim to nurture a new generation of engineers who are adaptable, forward-thinking, and capable of driving positive change. Through collaboration with industry leaders and the promotion of interdisciplinary research, we envision being at the forefront of advancements in mechanical engineering, addressing critical societal needs and shaping a sustainable future.

Mission Statement

The mission is to provide an exceptional educational experience that prepares students to become skilled and innovative professionals in the field of mechanical engineering. We are committed to fostering a collaborative and inclusive learning environment where students gain theoretical knowledge, practical skills, and a deep understanding of engineering principles. Through rigorous coursework, hands-on projects, and industry partnerships, we aim to equip our graduates with the tools and mindset necessary to tackle complex engineering challenges and contribute to the advancement of technology and society

2. Programme Specification

Programme code:	BSc-MECH	**ECTS**	300
Duration:	4 levels, 8 Semesters	**Method of Attendance:**	Full Time

Bachelor of Science in Mechanical Engineering is a wonderfully wide-ranging programme, which is very useful field. The programme contains 240 ECTS, (Each 1 ECTS = 25 hours)-5800 SWL, 2408

USSWL and 3392 SSWL distributed over 8 semesters for 4 academic years. The programme provides subjects related to general studies, specialized professional studies, as well as elective courses. Which are delivered to the student through tasks, practical assignments and theoretical materials. The details of the programme and specialized studies (course number, title and number of hours) have been fixed in addition to the elective courses, and the percentage of general subjects and elective studies is clear to the student and the teacher. The emphasis of the Programme is the whole Mechanical engineering to which everything is related. The degree is popular in many universities over the world.

Level 1: Students are introduced to the fundamental concepts and principles of engineering, mathematics, physics, and computer programming. They develop a strong foundation in core subjects like mechanics, thermodynamics, materials science, and engineering design. This level focuses on building analytical and problem-solving skills, as well as cultivating an understanding of engineering ethics and professional responsibility.

Level 2: Students deepen their understanding of mechanical engineering principles and expand their knowledge base. They delve into specialized areas such as fluid mechanics, heat transfer, dynamics, and control systems. Students are exposed to advanced mathematics, numerical methods, and computer-aided design tools to solve complex engineering problems. This level also emphasizes hands-on experience through laboratory work, practical projects, and team-based activities to foster teamwork and communication skills.

Level 3: Students engage in more specialized and advanced topics within mechanical engineering. They explore areas like solid mechanics, vibrations, robotics, mechatronics, and manufacturing processes. The curriculum may include courses on engineering analysis, optimization techniques, sustainable engineering, and product development. Students are encouraged to pursue independent research projects or internships to gain practical experience and apply their knowledge in real-world settings.

Level 4 Students integrate and apply their acquired knowledge and skills to solve complex engineering problems. They undertake a significant capstone project, which involves designing, developing, and implementing a practical solution or system. This level also incorporates professional development aspects, including engineering ethics, project management, and communication skills. Students may have the opportunity to showcase their projects to industry professionals and potential employers.

3. Program Goals

The academic programm in the Department of Mechanical Engineering aims at the need for graduates of the programme to be able to build abstract relationships and understand the impact of ideas based on the study and analysis of multiple theoretical, social, political, economic, cultural and environmental contexts. The programme goals can be listed as bellow:

a. Career Paths

To prepare students for diverse career paths in mechanical engineering, including but not limited to academia, research, industry, and entrepreneurship. Graduates should have the necessary skills to excel in a variety of roles such as design engineers, project managers, researchers, or consultants.

b. Design

To enable students to understand and apply the principles of design in mechanical engineering. This includes an emphasis on problem-solving, innovation, and the practical application of theoretical concepts. Graduates should be able to design systems or components to meet desired needs within realistic constraints such as economic, environmental, social, ethical, health and safety, manufacturability, and sustainability.

c. Ecological Knowledge and Responsibility

To instill in students a deep understanding of the ecological impact of mechanical engineering practices. Graduates should be capable of designing systems that minimize environmental impact and promote sustainability, and they should understand the importance of developing and implementing eco-friendly engineering solutions.

d. History and Theory

To provide students with a solid foundation in both the historical development and theoretical underpinnings of mechanical engineering. This will allow graduates to understand the context in which engineering decisions are made and how previous advancements have shaped current practices.

e. Research and Innovation

To foster a culture of research and innovation. Students should be exposed to cutting-edge research and encouraged to contribute to ongoing developments in the field. Graduates should be able to identify, formulate, and solve complex engineering problems using principles of engineering, science, and mathematics.

f. Leadership and Collaboration

To develop leadership skills and the ability to work effectively in teams. This includes understanding the roles and responsibilities of team members, the importance of communication, and the value of diverse perspectives. Graduates should be prepared to take on leadership roles in their careers and to work collaboratively in multidisciplinary teams.

g. Learning and Teaching Culture

To cultivate a culture of continuous learning. This includes promoting curiosity, encouraging critical thinking, and fostering a desire for lifelong learning. Graduates should recognize the need for, and have the ability to engage in independent and life-long learning in the broadest context of technological change.

h. Social Equity and Inclusion

To promote a culture of inclusivity and social equity. This includes striving to ensure that all students, regardless of background, have the opportunity to succeed. It also involves teaching students to design and implement engineering solutions that are inclusive and take into account the needs of a diverse society.

4. Student Learning Outcomes

The learning outcomes of a BSc in Mechanical Engineering aim to produce graduates who have a robust understanding of fundamental engineering principles, and the ability to apply this knowledge to identify, formulate, and solve complex engineering problems. Students are expected to design and develop systems, components, or processes to meet specific needs, taking into account realistic

constraints such as economic, environmental, social, political, ethical, and manufacturing considerations. They should be capable of conducting experiments, as well as analyzing and interpreting data to draw meaningful conclusions. In addition, students should have familiarity with and the ability to effectively utilize modern engineering tools and software. Finally, graduates are expected to understand the societal impacts of engineering solutions and be able to apply their knowledge ethically and responsibly, demonstrating an awareness of contemporary issues and an ability to engage in lifelong learning.

Outcome 1

Identification of Complex Relationships

Graduates will learn to identify and understand complex relationships in mechanical systems, including those between components and subsystems in larger systems. This involves understanding how changes in one part of a system can influence other parts and the system as a whole.

Outcome 2

Oral and Written Communication

Graduates will develop strong communication skills, allowing them to effectively present their ideas and findings both orally and in writing. They should be able to clearly articulate complex technical concepts to a variety of audiences, including non-engineers.

Outcome 3

Laboratory and Field Studies

Graduates will be gain hands-on experience conducting experiments in labs and in real-world settings. They should understand the principles of experimental design and be able to collect, interpret, and analyze data gathered from these experiments.

Outcome 4

Scientific Knowledge

Graduates will be possessing a strong foundation in the natural sciences, including physics and chemistry, as well as mathematics, and will understand how these fields apply to mechanical engineering. They should be able to use this scientific knowledge to inform their engineering practices.

Outcome 5

Data Analyses

Graduates will become proficient in analyzing and interpreting complex data sets. This includes the ability to use statistical methods, computational tools, and software packages to derive insights from data and apply these insights to engineering problems.

Outcome 6

Critical Thinking

Graduates will be able to develop strong problem-solving and critical thinking skills. They should be able to critically evaluate different approaches to a problem and develop innovative and effective solutions.

Outcome 7

Use of Precedents

Graduates will understand the value of historical engineering solutions and be able to use these precedents to inform their own work. They will appreciate the importance of learning from past successes and failures in engineering.

Outcome 8

History and Global Culture

Graduates will gain an understanding of the global and societal context in which mechanical engineering operates. This includes awareness of the historical development of the discipline, understanding of its impact on society and the environment, and the ability to work effectively in a global and diverse workforce.

5. Academic Staff:

The following list including the faculty of in the mechanical department

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6. Credits, Grading and GPA

Credits

Diyala University is following the Bologna Process with the European Credit Transfer System (ECTS) credit system. The total degree programme 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 5-year B.Sc. degree:
   CGPA = [(1st module score x ECTS) + (2nd module score x ECTS) + ……] / 300

7. Curriculum/Modules

Semester 1 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
E 101	Mathematics I	78	72	6	B	
ME 101	Physics	78	47	5	C	
ME 102	Static mechanic I	63	62	5	C	
ME 103	Electrical engineering	93	57	6	B	
U 101	Human Rights and Democracy	48	2	2	S	
ME 104	Engineering Workshops	48	52	4	B	

Semester 2 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
E 102	Mathematics II	78	72	6	B	E 101
U 103	Computer Skills	64	61	5	B	
ME 105	Static mechanic II	63	62	5	C	

ME 106	Engineering Drawing	108	67	7	B	
U 104	English Language	48	2	2	S	
ME 107	Manufacturing process	79	46	5	C	

Semester 3 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ME 201	Strength of Materials	93	57	6	B	
ME 211	Applied Mathematics I	63	87	6	B	
ME 210	Thermodynamics	93	57	6	S	
ME 204	Engineering of Metallurgy	78	47	5	B	
ME 206	Applied Computer Programming	48	27	3	S	
UD 04	English Language	33	17	2	C	
UD 05	Extinct Ba'ath Party Crimes	33	17	2	C	

Semester 4 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ME 207	Dynamics	78	72	150	6	
ME 212	Electrical Machines	78	47	125	5	
ME 214	Applied Mathematics II	63	87	150	6	
ME 208	Mechanical Drawing by CAD	78	47	125	5	
ME 202	Fluid Mechanics I	93	57	150	6	
UD 06	Arabic Language	33	17	50	2	

Semester 5 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ME 301	Mechanics of Machines	78	72	6	C	
ME 306	Internal Combustion Engines	78	47	5	C	
ME 303	Engineering Analysis	63	37	4	S	
ME 302	Engineering Statistics	48	52	4	S	
ME 304	Fluid Mechanics II	93	32	5	C	
ME 312	Electrical Machines	48	27	3	C	

Semester 6 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ME 307	Engineering Numerical Methods	63	37	4	S	
ME 308	Production Engineering	48	77	5	C	
ME 313	Operations Research	48	52	4	S	
ME 311	Heat Transfer	93	57	6	C	
ME 310	Engineering Materials	63	37	4	C	

Semester 7 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ME 401	Design of Machine Elements I	78	72	6	C	
E 404	Engineering Economy	48	27	3	S	
ME 403	Industrial Engineering	63	87	6	C	
ME 404	Mechanical Vibrations	93	32	5	C	
ME 405	Air Conditioning	93	-43	2	C	
E 402	Eng. Graduation Project I	63	37	4	C	
ME 421	ME Elective Class	48	52	4	C	

Semester 8 | 30 ECTS | 1 ECTS = 25 hrs

Code	Module	SSWL	USSWL	ECTS	Type	Pre-request
ME 409	Design of Machine Elements II	78	72	6	C	
ME 402	Control Engineering	93	57	6	C	
ME 411	CAE	33	67	4	C	
ME 407	Power Plants	48	77	5	C	
ME 422	ME Elective Class	48	77	5	C	
E 403	Eng. Graduation Project II	63	37	4	C	

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