Identification	**Subject**	ME201, Introduction to mechanical engineering, 6 ECTS
	Department	Mechanical Engineering
	Program	Undergraduate
	Term	Spring 2026
	Instructor	Tarlan Farajov
	E-mail:	tarlan.farajov@khazar.org
	Phone:	
	Classroom/hours	
	Office hours	
Prerequisites	General knowledge in Mathematics, Physics and Chemistry	
Language	English	
Compulsory/ Elective	Compulsory	
Required textbooks and course materials	1. Introduction To Mechanical Engineering by J. Paulo Davim, Springer, 2018 2. An introduction to mechanical engineering by Jonathan Wickert, Kemper Lewis, 3rd edition, 2013.	
Course website		
Course outline	This course aims to familiarize students with the realm of mechanical engineering, exploring the interconnections between physics, mathematics, communications, and sciences that underpin the analysis, design, and production of mechanical products and systems. It serves as a foundational introduction to key mechanical engineering subjects that will be further explored in subsequent years, including Statics, Strength of Materials, Fluid Mechanics, and Heat Transfer. In addition to theoretical concepts, students will gain insights into the operational principles of commonly encountered equipment, intriguing manufacturing processes, engineering communities, industrial standards, and international unit systems. The course also encompasses the development of technical communication skills, the definition of problems, and an understanding of engineering ethics.	
Course objectives	This course is designed to provide mechanical engineering students with a foundational understanding of this branch of engineering. The key objectives of the introduction to mechanical engineering course include: • Tailoring the course content to align with the background, maturity, and interests of students early in their engineering studies. • Introducing students to the importance of mechanical design principles in creating innovative solutions to global technical challenges. • Developing critical thinking and problem-solving skills, with a focus on formulating sound assumptions, making order-of-magnitude approximations, performing double-checks, and maintaining proper unit consistency. • Communicating fundamental aspects of mechanical engineering science and empiricism applicable at the freshman and sophomore levels.	

<table>
<tr><td></td><td colspan="3">Exposing students to a diverse array of hardware, inventive designs, engineering technology, and the hands-on aspects of mechanical engineering.
Instilling excitement through real-world applications in urban infrastructure development, nanomachines, aircraft, space flight, robotics, engines, consumer products, transmissions, renewable energy generation, and more.
Demonstrating and explaining the basic working principles of commonly encountered equipment and automotive parts.</td></tr>
<tr><td>Learning outcomes</td><td colspan="3">Upon successful completion of this course, students will acquire the following skills and knowledge:
Articulate a comprehensive definition of mechanical engineering.
Provide an overview of various subfields within mechanical engineering.
Differentiate mechanical engineering from other engineering disciplines.
Explain key elements of engineering design and project management.
Apply engineering measurements, units, and conversions effectively.
Demonstrate a clear understanding of engineering ethics and the ability to navigate ethical dilemmas.
Exhibit proficiency in both oral and written technical communication, adhering to accepted standards within the mechanical engineering community.
Execute basic computations for common problems encountered in mechanical engineering.
Describe the fundamental principles of key mechanical equipment such as pumps, compressors, internal combustion engines, and more.</td></tr>
<tr><td rowspan="7">Teaching methods</td><td colspan="2">Lecture</td><td>x</td></tr>
<tr><td colspan="2">Group discussion</td><td>x</td></tr>
<tr><td colspan="2">Experiential exercise</td><td>--</td></tr>
<tr><td colspan="2">Tutorials once a month on weekends</td><td>--</td></tr>
<tr><td colspan="2">Case analysis and assignments</td><td>x</td></tr>
<tr><td colspan="2">Course paper</td><td>--</td></tr>
<tr><td colspan="2">Others</td><td>--</td></tr>
<tr><td rowspan="8">Evaluation</td><td>Methods</td><td>Date/deadlines</td><td>Percentage (%)</td></tr>
<tr><td>Midterm Exam</td><td></td><td>30</td></tr>
<tr><td>Attendance & Activity</td><td></td><td>5</td></tr>
<tr><td>Quiz (2 quizzes)</td><td></td><td>10</td></tr>
<tr><td>Assignment</td><td></td><td>10</td></tr>
<tr><td>Seminar</td><td></td><td>5</td></tr>
<tr><td>Final Exam</td><td></td><td>40</td></tr>
<tr><td>Total</td><td></td><td>100</td></tr>
<tr><td>Policy</td><td colspan="3">▪ Ethics
Copying other students' work is highly discouraged. All assignments</td></tr>
</table>

	must be handled by the student himself. This is a university policy and violators will be reprimanded accordingly. ▪ **Preparation for class** The structure of this course demands your individual effort outside the classroom for extra practice of many problems within the textbook. After each session, every student needs to put sufficient time to practice and finish the assignments by the predetermined date. • **Withdrawal (pass/fail)** This course strictly follows the grading policy of the School of Science and Engineering. Thus, a student is expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year. ▪ **Cheating/plagiarism** Cheating or other plagiarism in handling the assignments, Mid-term and Final Examinations will lead to course failure. In this case, the student will automatically get zero (0), without any considerations. ▪ **Professional behavior guidelines** The students shall behave in a way to create a favorable academic and professional environment during the class hours. ▪ **Attendance & Activity** Attendance and in-class activity constitute 5 marks out of the total 100 marks for this course. Students who attend and actively participate in class activities will receive these marks. For each unexcused absence, 1 mark will be deducted from the attendance and activity score. ▪ **Quiz** Quizzes constitute 10 marks out of the total 100 marks for this course. Two quizzes will be conducted throughout the semester: one quiz before the midterm examination and one quiz after the midterm examination. Quiz questions will primarily focus on fundamental concepts of mechanical engineering, basic problem-solving, and conceptual understanding. Full credit will be awarded only for clearly explained answers and properly justified final results. ▪ **Assignment** Assignments constitute 10 marks out of the total 100 marks for this course. Students are required to submit assigned homework tasks by the specified deadlines. Assignments may include short analytical questions, conceptual exercises, or introductory problem-solving related to mechanical engineering topics. Full credit will be awarded only for complete, well-structured solutions with clear explanations and properly supported final results. ▪ **Seminar** The seminar constitutes 5 marks out of the total 100 marks for this course. Students are required to prepare and deliver a short presentation on a selected topic related to mechanical engineering. Evaluation will be based on the clarity of presentation, technical understanding of the topic,

	organization, and effective communication skills. ▪ **Exam** The midterm and final examinations will assess the topics covered in the course as outlined in the syllabus, with a focus on students understanding of fundamental mechanical engineering concepts and their ability to apply basic principles to problem-solving situations.

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/ Assignments
1		The Mechanical Engineering Profession	Chap 1, Ref1
2		Introduction to MECHANICAL DESIGN	Chap 2, Ref1,2
3		Manufacturing process	Chap 2, Ref1,2
4		Technical problem-solving	Chap 3, Ref1,2
5		Forces in Structures and Machines	Chap 4, Ref1,2
6		Materials	Chap 5, Ref1,2
7		Stress in Engineering and Factors affect stress creation	Chap 5, Ref1,2
8		Review **Midterm exam**	
9		Fluids Mechanics; Valves - general overview of valves, its parts, and functions. Application in Industry	Chap 6, Ref1,2
10		Thermal and Energy Systems	Will be provided
11		Motion and Power Transmission	Will be provided
12		Introduction to Rotating equipment	Chap 7, Ref1,2
13		Introduction to Static Equipment	Chap 8, Ref1,2
14		Introduce CAD/ CAM	Will be provided
15		Introduction to Subsea, Offshore and Onshore equipment	Will be provided
16		**Final Exam**	

This syllabus is a guide for the course and any modifications to it will be announced in advance.