Identification	**Subject**	ENGR 205, Engineering Mechanics – 6 ECTS
	Department	Mechanical Engineering
	Program	Undergraduate
	Term	Fall 2024
	Instructor	Khalig Mammadov
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	Phone:	
	Classroom/hours	
	Office hours	
Prerequisites	Mathematics, Physics I	
Language	English	
Compulsory/Elective	Compulsory	
Required textbooks and course materials	Engineering Mechanics: Statics, 9th *edition J.L. Meriam, L.G. Kraige and J.N. Bolton, 2018*	
Course website		
Course outline	Engineering Mechanics, a branch of physical science, focuses on studying the effects of forces on objects, playing an essential role in both engineering analysis and industrial applications. In engineering, applying mechanical principles is critical for assessing how forces and other factors influence various systems and structures. Advancements and innovations across multiple disciplines are deeply rooted in these foundational principles, which serve as the backbone for research in areas such as vibrations, fluid dynamics, engine performance, and more. A comprehensive understanding of Engineering Mechanics is crucial for professionals in these fields and beyond. Additionally, mastering this subject not only equips individuals with the necessary skills but also provides a solid foundation for deeper exploration of material sciences and related topics, preparing students for more advanced studies.	
Course objectives	Engineering Mechanics is regarded as a cornerstone for numerous evolving fields. Many disciplines, including civil, mechanical, and agricultural engineering, heavily depend on statics and dynamics, which form the core of engineering mechanics. Even in areas that may not directly involve mechanical aspects, such as the electrical components of robotic systems or various manufacturing processes, principles of engineering mechanics are still applied in some form. As a result, Engineering Mechanics plays a crucial role in the engineering curriculum, providing a framework for solving complex problems in future key subjects like applied mathematics, physics, and material sciences. Moreover, it enhances students' problem-solving abilities in their current studies and fosters the development of solution-oriented thinking skills.	
Learning outcomes	Upon successfully completing this course, students will develop the following competencies: 1. Apply Newton's laws of motion to solve real-world problems. 2. Utilize vectors and their applications in both 2D and 3D coordinate systems. 3. Identify the moment of a force, calculate its value about a given axis, and define the moment of a couple. 4. Determine the application of forces at various points. 5. Create "Free Body Diagrams" for real-world scenarios, using Newton's laws and vector operations to evaluate equilibrium in particles and rigid bodies. 6. Apply the principles of equilibrium to analyze forces in planar truss members. 7. Gain an understanding of structural analysis in beam construction. which will be widely delivered in next course during strength of materials	

<table>
<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>25</td></tr>
<tr><td>Class Participation</td><td></td><td>5</td></tr>
<tr><td>Assignment / delivery of presentations</td><td></td><td>10</td></tr>
<tr><td>Quizzes</td><td></td><td>20</td></tr>
<tr><td>Project</td><td></td><td>-</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 another student's work is strictly prohibited. Each student must complete their assignments independently in accordance with university policies. Violations of this rule will result in disciplinary action.

Preparation for Class
This course requires significant individual effort outside of class for practice on problems from the textbook. After each class, students are expected to dedicate time to complete assignments by the specified deadlines. There will be four assignments in the Engineering Mechanics course, aimed at reinforcing theoretical and practical knowledge. Late submissions will incur a 10% penalty for each day past the deadline. To assess students' understanding of recent lectures, six quizzes will be conducted as self-assessment tools. Make-up quizzes will only be allowed in cases of documented emergencies or with prior arrangements. The final grade will be based on assignments, quizzes, and a comprehensive final exam, with detailed grading criteria provided. Academic integrity is paramount; plagiarism or cheating will not be tolerated. For any questions or clarification, students are encouraged to contact the instructor.

Withdrawal (Pass/Fail)
This course adheres to the School of Engineering's grading policy, requiring a minimum score of 60% for a passing grade. Failure to meet this requirement will result in the need to retake the course in the following term or year.

Cheating/Plagiarism
Any instance of cheating or plagiarism on assignments, midterms, or the final exam will result in automatic failure of the course. The student will receive a grade of zero (0) with no exceptions or considerations.

Professional Behavior Guidelines
Students are expected to maintain professional conduct and contribute to a positive academic environment during class. Unapproved discussions and unethical behavior are strictly discouraged.
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<tr><td colspan="4">Tentative Schedule</td></tr>
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Week	Date/Day (tentative)	Topics	Textbook/Assignments
1	21/09/2024	Syllabus & Introduction	Chap 1
2	28/09/2024	Force Systems (Two-Dimensional Force Systems): -Rectangular Components -Moment -Couple -Resultants	Chap 2
3	05/10/2024	Force Systems (Three-Dimensional Force Systems): -Rectangular Components -Moment and Couple -Resultants	Chap 2
4	12/10/2024	Equilibrium (Equilibrium in Two Dimensions): -System Isolation and the Free-Body Diagram -Equilibrium Conditions	Chap 3
5	19/10/2024	Equilibrium (Equilibrium in Three Dimensions): -Equilibrium Conditions -Review	Chap 3
6	26/10/2024	Structures: -Plane Trusses -Method of Joints -Method of Sections	Chap 4
7	02/11/2024	Structures: -Space Trusses -Frames and Machines -Review	Chap 4
8	09/11/2024	**Solve problems – Review - Delivery of assignments. Midterm**	
9	16/11/2024	Distributed Forces - Introduction Centers of Mass and Centroids: -Center of Mass -Centroids of Lines, Areas, and Volumes	Chap 5
10	23/11/2024	Distributed Forces - Introduction Centers of Mass and Centroids: -Composite Bodies and Figures; Approximations -Theorems of Pappus	Chap 5
11	30/11/2024	Special Topics -Beams - External Effects -Beams - Internal Effects -Flexible Cables -Fluid Statics	Chap 5
12	07/12/2024	Friction (Frictional Phenomena) Friction (Applications of Friction in Machines)	Chap 6
13	14/12/2024	Area Moments of Inertia	Appendix A
14	21/12/2024	Mass Moments of Inertia	Appendix B
15	28/12/2024	Review – Solve problems - Delivery of assignments	
		Final Exam	