Identification	Subject	ENGR 205, Engineering Mechanics, 6 ECTS
	Department	Mechanical Engineering
	Program	Undergraduate
	Term	Spring 2026
	Instructor	Khalig Mammadov
	E-mail:	khaliq.mammadov@khazar.org
	Phone:	
	Classroom/hours	
	Office hours	
Prerequisites	Calculus I, 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 (main)* *Engineering Mechanics: Statics, R.C. Hibbeler, 13th Edition, Prentice Hall, 2012*	
Course website		
Course outline	Engineering Mechanics is at the heart of physical science, exploring how forces influence the behavior of objects and systems. Its principles form the backbone of engineering analysis and are indispensable across industrial and technological applications. By applying mechanical concepts, engineers can understand how loads, motion, and environmental factors shape the performance of structures and machines. A solid grasp of Engineering Mechanics not only sharpens analytical thinking but also builds the groundwork needed for deeper study in material science and other advanced disciplines. It equips students and professionals with the tools to innovate, solve complex problems, and excel in a wide range of engineering domains.	
Course objectives	• To identify force and couple systems acting on particles or rigid bodies by drawing free body diagrams. • To analyze static equilibrium of particles and rigid bodies. • To analyze internal forces in structures and beams. • To compute the geometric and mass properties of surfaces and solids.	
Learning outcomes	Upon completing this course, students will develop the following competencies: 1. Apply vector concepts to evaluate forces acting within two- and three-dimensional coordinate systems. 2. Use Newton's laws of motion to address real-world engineering challenges. 3. Create and interpret Free Body Diagrams to determine the equilibrium of particles and rigid bodies through Newton's laws and vector analysis. 4. Compute the moment of a force about a specified axis, define a couple moment, and explain their roles in mechanical systems. 5. Identify how forces applied at various points within a structure influences	

	its behavior and performance. 6. Examine the equilibrium of planar truss members using essential engineering principles. 7. Build a foundational understanding of beam structural analysis, preparing for more advanced study in Strength of Materials.	
Teaching methods	**Lecture**	x
	Group discussion	x
	Experiential exercise	--
	Tutorials once a month on weekends	--
	Case analysis and assignments	x
	Course paper	--
	Others	--

Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30
	Attendance & Activity	At each lesson	5
	Quiz (4 quizzes)	During the semester	15
	Assignment	During the semester	10
	Final Exam		40
	Total		100

Policy	
	▪ **Ethics** Copying other students' work is highly discouraged. All assignments 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 15 marks out of the total 100 marks for this course. Four quizzes will be conducted throughout the semester: two quizzes before the midterm examination and two quizzes before the end of the semester. Quiz questions will primarily be problem-solving in nature, and full credit will be awarded only for step-by-step solutions supported by clear explanations 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 problems by the specified deadlines. Full credit will be awarded only for complete, well-structured solutions with clear explanations and properly supported final results.

▪ **Exam**

The midterm and final examinations will assess the statics topics covered during the course as outlined in the syllabus, with a focus on conceptual understanding and problem-solving skills.

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/Assignments
1		Syllabus & Introduction - Basic Concepts	Chap 1
2		Force Systems (Two-Dimensional Force Systems): -Rectangular Components -Moment -Couple -Resultants	Chap 2
3		Force Systems (Three-Dimensional Force Systems): -Rectangular Components -Moment and Couple -Resultants	Chap 2
4		Equilibrium (Equilibrium in Two Dimensions): -System Isolation and the Free-Body Diagram -Equilibrium Conditions	Chap 3
5		Equilibrium (Equilibrium in Three Dimensions): -Equilibrium Conditions -Review	Chap 3
6		Structures: -Plane Trusses	Chap 4

		-Method of Joints	
7		Structures: -Method of Sections -Space Trusses	Chap 4
8		Review **Midterm**	
9		Structures: Frames and Machines	Chap 4
10		Distributed Forces - Introduction Centers of Mass and Centroids: -Center of Mass -Centroids of Lines, Areas, and Volumes	Chap 5
11		Centers of Mass and Centroids: -Composite Bodies and Figures; Approximations -Theorems of Pappus	Chap 5
12		Special Topics -Beams - External Effects -Beams - Internal Effects	Chap 5
13		Special Topics -Flexible Cables -Fluid Statics	Chap 5
14		Area Moments of Inertia Mass Moments of Inertia	Appendix A, B
15		Review – Solve problems	
16		**Final Exam**	

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