Identification	**Subject**	ENGR 205 Engineering Mechanics, 6 ECTS
	Department	Mechanical Engineering
	Program	Undergraduate
	Term	Spring 2024
	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, 9^{th} *edition J.L. Meriam, L.G. Kraige and J.N. Bolton, 2018*	
Course website		
Course outline	Engineering mechanics (Statics) introduces students with the principles of static equilibrium by applying Newton's laws of motion to solve engineering problems. The focus is on emphasizing the drawing free body diagrams and self checking strategies. Topics include introduction to forces; 2D equilibrium of particles and rigid bodies; centre of gravity and centroids; distributed loading and hydrostatics; friction; analysis of truss structures; and shear force and bending moment diagrams.	
Course objectives	This course is designed to develop students' understanding of and demonstrate proficiency in the following concepts and principles relating to vector mechanics, with a specific focus on statics. 1. Components of a force and the resultant force for a systems of forces 2. Moment caused by a force acting on a rigid body 3. Principle of transmissibility and the line of action 4. Moment due to several concurrent forces 5. Force and moment reactions at the supports and connections of a rigid body 6. Force in members of a trusses 7. Centroid and center of gravity for an area and a rigid body 8. Moment of inertia and radius of gyration of a composite area	
Learning outcomes	On successful completion of this course students will be able to: 1. Define Newton's laws of motion. 2. Recall trigonometric laws and apply them to the addition and decomposition of vectors quantities. 3. Identify the moment of a force and calculate its value about a specified axis. Define the moment of a couple. 4. Describe the concept of dry friction and analyze the equilibrium of rigid bodies subjected to this force. 5. Construct "Free Body Diagrams" of real-world problems and apply Newton's Laws of motion and vector operations to evaluate equilibrium of particles and bodies. 6. Apply the principles of equilibrium of particles and bodies to analyze the forces in planar truss members. 7. Discuss the concepts of center of gravity and centroids and compute their location for bodies of arbitrary shape. 8. Apply the concepts used for determining center of gravity and centroids to find the resultant of a generally distributed loading. 9. Use methods learnt for equilibrium of bodies and the resultant of a generally distributed loading to compute the internal forces in beams. Generalize the procedure to construct bending moments and shear force diagrams (internal forces) and utilize this information in engineering design.	

<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="7">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>At each lesson</td><td>5</td></tr>
<tr><td>Quiz</td><td>During the semester</td><td>10</td></tr>
<tr><td>Assignment</td><td>During the semester</td><td>20</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
Copy of 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. In this Engineering Mechanics course, students will encounter four assignments aimed at reinforcing their theoretical and practical understanding. Timely submission is essential, as late assignments incur a 10% daily penalty. Five quizzes will be conducted to assess students' grasp of recent lecture topics, serving as self-assessment tools. There won't be makeup quizzes except for documented emergencies or prior arrangements. The final grade will be determined by assignments, quizzes, and a comprehensive final exam, with provided grading criteria. Uphold academic integrity by ensuring your work is original, as plagiarism or cheating is strictly prohibited. Should students have any queries or need clarification, don't hesitate to reach out to the instructor.
Withdrawal (pass/fail)
This course strictly follows the grading policy of the School of Engineering. Thus, a student is normally 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
Students who attend the whole classes will get 5 marks. for three absence student loses 1 mark.
Quiz
There will be quizzes for checking understanding of content during class. We are not going to give make up for a missing Quiz due to any reason other than medical report.

</td></tr>
</table>

	▪ **Assignment** There will be a homework assignment for every chapter composed of problems.

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/Assignments
1		Syllabus & Introduction	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 -Method of Joints -Method of Sections	Chap 4
7		Structures: -Space Trusses -Frames and Machines -Review	Chap 4
8		**Solve problems – Review - Delivery of assignments.** **Midterm**	
9		Distributed Forces - Introduction Centers of Mass and Centroids: -Center of Mass -Centroids of Lines, Areas, and Volumes	Chap 5
10		Distributed Forces - Introduction Centers of Mass and Centroids: -Composite Bodies and Figures; Approximations -Theorems of Pappus	Chap 5
11		Special Topics -Beams - External Effects -Beams - Internal Effects -Flexible Cables -Fluid Statics	Chap 5
12		Friction (Frictional Phenomena) Friction (Applications of Friction in Machines)	Chap 6
13		Area Moments of Inertia	Appendix A
14		Mass Moments of Inertia	Appendix B
15		Review – Solve problems - Delivery of assignments	
16		**Final Exam**	