

Identification	Subject	Static
	Department	Civil Engineering Mechanical Engineering
	Program (Undergraduate, Graduate)	Undergraduate
	Term	autumn2026
	Instructor	Aynura Aliyeva
	Email:	aynurahasanova777@gmail.com
	Classroom/hours	
Prerequisites	Calculus (Mathematics) and Physics.	
Language	English	
Compulsory/Elective	Elective	
Textbooks and course materials	Hasanov, A.İ. <i>Theoretical Mechanics</i>. Baku: Elm və Təhsil, 2022. 314 pp. (Azerbaijani-language textbook; includes Statics, Kinematics, and Dynamics.) Beer, F.P., Johnston, E.R., DeWolf, J.T., Mazurek, D.F. <i>Vector Mechanics for Engineers: Statics</i>. 12th ed. McGraw-Hill, 2019. Hibbeler, R.C. <i>Engineering Mechanics: Statics</i>. 14th ed. Pearson, 2016. İbrahimov, İ.X., Süleymanov, T.S. <i>Exemplary Solutions of Problems in Theoretical Mechanics: Statics and Kinematics</i>. Baku: Elm və Təhsil, 2018. 162 pp.	
Course description	Statics is a fundamental course in engineering mechanics that deals with the equilibrium of particles and rigid bodies under the action of forces and moments. The course introduces the principles and methods required to analyze engineering structures and mechanical systems at rest. The course covers force systems, moments, equilibrium equations, free-body diagrams, structural analysis, trusses, friction, centroids and centers of gravity, moments of inertia, and internal forces in structural members. Emphasis is placed on solving practical engineering problems and applying the principles of statics to civil engineering structures.	
Course objectives	To introduce the fundamental principles of engineering statics. To develop students' understanding of forces, moments, and equilibrium. To develop the ability to construct and analyze free-body diagrams. To apply equilibrium equations to particles and rigid bodies. To determine support reactions in engineering structures. To analyze trusses and other simple structural systems. To introduce friction, centroids, centers of gravity, and moments of inertia. To develop students' ability to solve practical engineering mechanics problems. To develop analytical and problem-solving skills required for further engineering courses.	
Learning Outcomes	Identify and classify different types of forces and force systems. Calculate moments and couples about points and axes. Construct accurate free-body diagrams for engineering systems. Apply equations of equilibrium to particles and rigid bodies. Determine support reactions in beams, frames, and other structures. Analyze simple trusses using appropriate analytical methods. Solve problems involving friction and its applications. Determine centroids and	

	centers of gravity of composite bodies. Calculate moments of inertia of plane areas. Apply the principles of statics to practical civil engineering problems.		
Teaching methods	Case analysis		x
	Group discussion		x
	Lecture		x
	Simulation		x
Evaluation Criteria	Methods	Date/deadlines	Percentage (%)
	Midterm Exam	TBA	30
	Quizzes		15
	Practical Assignments		5
	Activity		5
	Attendance		5
	Final Exam	TBA	40
	Total		100
Class Policy	- Students are expected to attend classes regularly and participate actively in lectures, group discussions, problem-solving activities, and practical assignments. - Students should come to class prepared and complete all assigned work by the specified deadlines. Students are expected to demonstrate academic integrity in all examinations, quizzes, and assignments. Collaboration is encouraged during designated group activities, while individual assignments and examinations must represent the student's own work. - In Statics, GAI tools may only be used to clarify theoretical principles, such as force equilibrium and vector operations. All free-body diagrams, system equations, and numerical calculations must be produced entirely by the student. Any permitted AI assistance must be explicitly declared; unauthorized use will result in a zero grade (0) for the assignment.		
Tentative Schedule			
Week	Date/Day (tentative)	Topics	Textbook/Assignments
1		Introduction to Statics; basic concepts, units and dimensions; principles of mechanics	Beer et al.; Lecture notes
2		Force vectors; vector operations; resultant of a force system	Beer et al.; Problem-solving exercises
3		Moments of a force about a point and an axis; couples	Hibbeler; Practical problems
4		Equivalent force systems; resultant force and resultant moment	Beer et al.; Problem-solving exercises
5		Equilibrium of particles; free-body diagrams; equations of equilibrium	Həsənov, A.İ., Beer et al.,
6		Equilibrium of rigid bodies; support reactions and external forces	Həsənov, A.İ., <i>Theoretical Mechanics</i> , 2022 – Statics;

7		Analysis of beams and simple structures; internal forces	Beer et al.; Problem-solving exercises
		Midterm exam	
8		Trusses; methods of joints and sections	Beer et al.; Problem-solving exercises
9		Frames and machines; analysis of interconnected rigid bodies	Həsənov, A.İ. , <i>Theoretical Mechanics</i> , 2022 – Statics;
10		Friction; laws of dry friction and engineering applications	Beer et al.; Problem-solving exercises
11		Centroids and centers of gravity; composite areas and bodies	Beer et al.; Problem-solving exercises
12		Moments of inertia of areas; parallel-axis theorem	Həsənov, A.İ. , <i>Theoretical Mechanics</i> , 2022 – Statics;
13		Product of inertia and principal axes of inertia	Beer et al.; Problem-solving exercises
14		Distributed forces; hydrostatic loading and applications of statics	Beer et al.; Problem-solving exercises
15		Comprehensive review; structural analysis and engineering problem solving	Həsənov, A.İ. , <i>Theoretical Mechanics</i> , 2022 – Statics;
		Final exam	