

Identification	Subject	Applied Mechanics	
	Department		
	Program (Undergraduate, Graduate)	Undergraduate	
	Term	Autumn 2026	
	Instructor	Aynura Aliyeva	
	Email:	Aynurahasanova777@gmail.com	
	Classroom/hours		
Prerequisites	Theoretical Mechanics; Strength of Materials (recommended)		
Language	English		
Compulsory/Elective	Elective		
Textbooks and course materials	Bakhshaliyev, V.I. <i>Applied Mechanics: Theoretical Mechanics and Strength of Materials</i> . Baku: Elm və Təhsil, 2017, 452 pp. Mammadov, F.H., Khalilov, I.A., Karimov, S.Kh., Mehtiyev, R.M. <i>Applied Mechanics</i> . Baku: Turxan NPB, 2014, 312 pp. Beer, F.P., Johnston, E.R., Cornwell, P.J. <i>Vector Mechanics for Engineers: Statics and Dynamics</i> . McGraw-Hill. Hibbeler, R.C. <i>Engineering Mechanics: Statics and Dynamics</i> . Pearson.		
Course description	This course introduces the fundamental principles and applications of mechanics in engineering. It covers statics, kinematics, kinetics, force systems, equilibrium, motion of particles and rigid bodies, work and energy, impulse and momentum, friction, and basic structural and mechanical applications. The course emphasizes problem-solving and practical engineering applications.		
Course objectives	Introduce the fundamental principles of applied mechanics. Develop an understanding of forces, moments, equilibrium, and motion. Apply mathematical and physical principles to engineering problems.Develop skills in free-body diagrams and mechanical analysis. Analyze the motion of particles and rigid bodies. Apply work-energy and impulse-momentum principles Develop practical problem-solving skills for civil and mechanical engineering applications.		
Learning Outcomes	Upon successful completion of the course, students will be able to: Identify and analyze forces and moments acting on engineering systems.Draw and interpret free-body diagrams.Apply equilibrium equations to engineering structures and mechanical systems.Analyze particle and rigid-body motion.Calculate velocity and acceleration in mechanical systems.Apply Newton's laws of motion to engineering problems.Solve problems using work-energy principles.Apply impulse and momentum principles.Analyze friction and its engineering applications.Solve practical mechanics problems using appropriate analytical methods.		
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, participate actively in discussions and practical activities, complete assignments on time, and follow academic integrity rules. Students are responsible for all materials covered during lectures and practical sessions. GAI is permitted as a supplementary tutor to help break down complex kinematic and dynamic concepts. Submitting AI-generated solutions, system simulations, or complete project assessments constitutes academic dishonesty and will lead to an immediate score reduction or a zero (0).		
Tentative Schedule				
Week	Date/Day (tentative)	Topics	Textbook/Assignments	
1		Introduction to Applied Mechanics – Basic concepts, units, dimensions, mechanical systems and engineering applications	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	
2		Force Systems and Force Vectors – Components, resultant forces, vector operations	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	
3		Moments and Couples – Moment of a force, moment about an axis, couples	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	
4		Equilibrium of Particles and Rigid Bodies – Free-body diagrams, support reactions, equilibrium equations	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	
5		Structural Systems and Internal Forces – Beams, shear force and bending moment	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	
6		Trusses, Frames and Machines – Method of joints and sections, analysis of structures	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	
7		Friction and Engineering Applications – Dry friction, friction forces and equilibrium with friction	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	
		Midterm exam		
8		Kinematics of Particles – Position, displacement, velocity and acceleration	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	
9		Rectilinear and Curvilinear Motion – Cartesian, normal and tangential components	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	
10		Kinetics of Particles – Newton's laws of motion, equation of motion	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	
11		Work and Energy – Work of forces, kinetic energy, potential energy, conservation of energy	Hajiyeve, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.	

12		Impulse and Momentum – Linear momentum, impulse, conservation of momentum	Hajiyev, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.
13		Kinematics of Rigid Bodies – Translation, rotation and general plane motion	Hajiyev, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.
14		Kinetics of Rigid Bodies – Equations of motion, moments of inertia and rotational dynamics	Hajiyev, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.
15		Comprehensive Review and Engineering Applications – Integrated	Hajiyev, Mukhlis. <i>Applied Mechanics: Problems and Solutions</i> . Baku, 2016.
		Final exam	