Identification	**Subject**	Engineering Mechanics, 6 ECTS credits
	Department	Civil Engineering
	Program	Undergraduate
	Semester	Fall, 2019
	Instructor	Mehdi Bashiri
	E-mail:	mbashiri@khazar.org
	Phone:	
Prerequisites	Mathematics, Physics	
Language	English	
Compulsory/Elective	Compulsory	
Required textbooks and course materials	Beer Johnson Static Mechanical Engineering, Khazar university handbook	
Course outline	Mechanics is the physical science which deals with the effects of forces on subjects. No other subject plays a greater role in engineering analysis than mechanics. Although the principles of mechanics are few, they have wide application in engineering. The principles of mechanics are central to research and development in the fields of vibrations, stability and strength of structures and machines, robotics, rocket and spacecraft design, automatic control, engine performance, fluid flow, electrical machines and apparatus, and molecular, atomic, and subatomic behavior. A thorough understanding of this subject is an essential prerequisite for work in these and many other fields.	
Course objectives	Engineering mechanics is both a foundation and a framework for most of the branches of engineering. Many of the topics in such area as civil, mechanical, aerospace, and agricultural engineering, and of course engineering mechanics itself, are based upon the subjects of statics and dynamics. Even in a discipline such as electrical engineering, practitioners, in the course of considering the electrical components of a robotic device or a manufacturing process, may find themselves first having to deal with the mechanics involved. Thus, the engineering mechanics sequence is critical to the engineering curriculum. Not only is this sequence needed in itself, but courses in engineering mechanics also serve to solidify the student's understanding of other important subjects, including applied mathematics, physics, and graphics. In addition, these courses serve as excellent settings in which to strengthen problem-solving abilities.	
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 to the addition and decomposition of vectors 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 ``centre of gravity" and ``centroids" and compute their location for bodies of arbitrary shape. 8. Apply the concepts used for determining centre of gravity and centroids to	

	find the resultant of a generally distributed loading. 9. Implement 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.

Teaching methods	**Lecture**	x
	Group discussion	--
	Experiential exercise	--
	Lab	--
	Case analysis	x
	Course paper	x
	Others	---

Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30
	Class Participation		10
	Assignment		
	Quizzes		20
	Project		--
	Final Exam		40
	Total		100

Policy

- **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.

- **Withdrawal (pass/fail)**
  This course strictly follows 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 the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly discouraged.

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/Assignments
1		Introduction to statics	

2		STATICS OF PARTICLE	
3		RIGID BODIES: EQUIVALENT SYSTEMS OF FORCES	
4		EQUILIBRIUM OF RIGID BODIES	
5		EQUILIBRIUM OF RIGID BODIES	
6		**Midterm exam**	
7		DISTRIBUTED FORCES: CENTROIDS AND CENTERS OF GRAVITY	
8		DISTRIBUTED FORCES: CENTROIDS AND CENTERS OF GRAVITY	
9		ANALYSIS OF STRUCTURES: Trusses	
10		ANALYSIS OF STRUCTURES: Trusses	
11		ANALYSIS OF STRUCTURES: Frames and Machines	
12		ANALYSIS OF STRUCTURES: Frames and Machines	
13		FORCES IN BEAMS AND CABLES	
14		FRICTION	
15		METHOD OF VIRTUAL WORK	
16		**Final Exam**	