Identification	**Subject**	Engineering Mechanics – 6 ECTS credits
	Department	Civil Engineering
	Program	Undergraduate
	Term	Spring, 2018
	Instructor	Mehdi Kiyasatfar
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	Phone:	
	Classroom/hours	Wednesday 10:10 and Thursday, 11:50
	Office hours	Wednesday and Thursday, 14:00 -15:00
Prerequisites	General Physics 1, Math: Calculus of Functions of Several Variables General understanding of rules and techniques dealing with vectors and forces	
Language	English	
Compulsory/Elective	Compulsory	
Required textbooks and course materials	Core textbook: 1. Engineering Mechanics Statics, by Hibbeler, R.C., Pearson-Prentice Hall. (Latest ed.) References: 1- Beer, F.P., Johnston, E.R., "Vector Mechanics for Engineering Statics", McGraw-Hill International Book Company 2- Meriam, J.L., Kraige, L.G., "Engineering Mechanics, Statics", John Wiley&Sons Inc	
Course website		
Course outline	Statics is the study of methods for quantifying the forces between bodies. Forces are responsible for maintaining balance and causing motion of bodies, or changes in their shape. You encounter a great number and variety of examples of forces every day, such as when you press a button, turn a doorknob, or run your hands through your hair. Motion and changes in shape are critical to the functionality of man-made objects as well as objects the nature. Statics is an essential prerequisite for many branches of engineering, such as mechanical, civil, aeronautical, and bioengineering, which address the various consequences of forces. This course introduces the concepts of engineering based on forces in equilibrium. Topics include concentrated forces, distributed forces, forces due to friction, and inertia as they apply to machines, structures, and systems. Upon completion, students should be able to solve problems which require the ability to analyze systems of forces in static equilibrium.	
Course objectives	At the end of this course, the students will be able to calculate the moment of a force and couple vector in 3D-space using vector algebra determine the resultants of force systems acting on rigid bodies identify the types of contact between rigid bodies and draw the free body diagrams for a rigid body or for a group of rigid bodies establish the equations of equilibrium for a rigid body or a group of rigid bodies ◦ calculate the internal forces in engineering structures composed of simple trusses or beams analyze the static problems involving Coulomb friction, complex surface contact friction and belt friction determine the geometric properties of surfaces and volumes/	
Learning outcomes	Upon successful completion of this course the student shall be able to: 1. Students will be able to draw complete free-body diagrams and write appropriate equilibrium equations from the free-body diagram, including the support reactions on a structure. Students will display proficiencies by demonstrating the following	

	competencies: a. Describe position, forces, and moments in terms of vector forms in two and three dimensions. b. Determine rectangular and nonrectangular components of a force. c. Determine the resultant of a force system including distributed forces. d. Simplify systems of forces and moments to equivalent systems. 2. Students will be able to apply the concepts of equilibrium to various structures. Students will display proficiencies by demonstrating the following competencies: a. Evaluate forces in trusses, frames and machines. b. Determine the internal forces in a structure. c. Analyze systems that include frictional forces. 3. Students will be able to calculate moments, centers of mass, and forces for particular structures. Students will display proficiencies by demonstrating the following competencies: a. Centers of gravity and centroids for: 1) Discrete particles and a body of arbitrary shape. 2) A body having axial symmetry. b. The resultant force of a pressure loading by a fluid. c. The moments of inertia for an area.

Teaching methods	**Lecture**		x
	Group discussion		--
	Experiential exercise		--
	Lab		--
	Case analysis		x
	Course paper		x
	Others		---
Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		20
	Class Participation		10
	Assignment and quizzes		30
	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		General Principles	Chap 1
2		Force Vectors	Chap 2
3		Equilibrium of a Particle	Chap 2
4		Force System Resultants 1	Chap 3
5		Force System Resultants 2	Chap 3
6		**Quiz 1/ Delivery of assignments**	
7		Equilibrium of a Rigid Body 1	Chap 4
8		Equilibrium of a Rigid Body 2	Chap 4
9		Structural Analysis	Chap 5
10		Internal Forces	Chap 6
11		**Quiz 2/ Delivery of assignments**	
12		Friction	Chap 7
13		Center of Gravity and Centroid	Chap 8
14		Moments of Inertia	Chap 9
15		**Quiz 3/ Delivery of assignments**	
16		**Final Exam/ Delivery of assignments**	