

Identification	Subject	Engineering Mechanics – 3credits
	Department	Chemical Engineering
	Program	Undergraduate
	Term	Spring, 2017
	Instructor	Mirsadegh Seyedzavvar
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	Phone:	
	Classroom/hours	11 Mehseti str.(Neftchilar campus), Room number, 409 Monday, 17:00-18:30, Thursday, 15:20-16:50
	Office hours	Monday and Wednesday, 12:00 – 13:00
Prerequisites	Engineering Mechanics <i>general understanding of rules and techniques of Phisic Mechanics</i>	
Language	English	
Compulsory/Elective	Compulsory	
Required textbooks and course materials	Statics by Meriam and Kraige, <i>Copies of the book is available in the library. Also, students are encouraged to Send an email to the instructor. The pdf file will be emailed back in 24h.</i>	
Course website		
Course outline	<p>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, staibility 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 behaviour. A through understanding of this subject is an essencial prerequisite for work in these and many other fields.</p>	
Course objectives	<p>Engineering mechanics is both a fundation 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, practitionaries, in the course of considering the electrical components of a robotic device or a manufacturing process, may find themeselves 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.</p>	
Learning outcomes	<p>On successful completion of this course students will be able to:</p> <ol style="list-style-type: none"> 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 analyse the equilibrium of rigid bodies subjected to this force. 5. Construct "Free Body Diagrams" of real world problems and apply Newton's 	

	<p>Laws of motion and vector operations to evaluate equilibrium of particles and bodies.</p> <p>6. Apply the principles of equilibrium of particles and bodies to analyse the forces in planar truss members.</p> <p>7. Discuss the concepts of "centre of gravity" and "centroids" and compute their location for bodies of arbitrary shape.</p> <p>8. Apply the concepts used for determining centre of gravity and centroids to find the resultant of a generally distributed loading.</p> <p>9. Implement methods learnt for equilibrium of bodies and the resultant of a generally distributed loading to compute the internal forces in beams. Generalise the procedure to construct bending moments and shear force diagrams (internal forces) and utilise this information in engineering design.</p>		
Teaching methods	Lecture		x
	Group discussion		--
	Experiential exercise		--
	Lab		--
	Case analysis		x
	Course paper		x
	Others		---
Evaluation	Methods	Date/deadlines	Percentage (%)
	Midterm Exam		25
	Class Participation		5
	Assignment and quizzes		30
	Project		--
	Final Exam		40
	Total		100
Policy	<ul style="list-style-type: none"> ▪ 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	Chap 1
2		Two-dimensional force systems	Chap 2
3		Three-dimensional force systems	Chap 2
4		Equilibrium in two dimensions	Chap 2
5		Introduction to structures/Plane trusses	Chap 4
6		Methods of joints in plane trusses	Chap 4
7		Quiz 1/ Delivery of assignments	
8		Methods of sections in plane trusses	Chap 4
9		Frames and machines	Chap 4
10		Center of mass	Chap 5
11		Centroids of lines, areas, and volumes	Chap 5
12		Composites bodies and figures	Chap 5
13		Frictional behaviour and dry friction	Chap 6
14		Virtual work and equilibrium	Chap 7
15		Potential energy and stability	Chap 7
16		Final Exam/ Delivery of assignments	