ME 322, Engineering Mechanics, Fall 2009, CRN 42499, TR 10:00 ~ 11:47, UC2-228

Designation : A required course for all ME students.

Course Description – CATALOG DATA

ME 322 Engineering Mechanics (4)
Statics and dynamics of particles and rigid bodies: analysis of trusses, frames, beams, centroids and moments of inertia; kinematics, Newton's Second Law, work and energy, linear and angular impulse and momentum. With laboratory.

Instructor : Yin-ping (Daniel) Chang, Associate Professor
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TA : Ms. Di Wu, dwu@oakland.edu, Lab 213 DHE, Office hours : T 9:15 ~ 10:00

Textbook : "Engineering Mechanics – Statics & Dynamics," Hibbeler, 12th ed. Prentice Hall.

Prerequisites : EGR 280 and major standing.

HW Policy : The HW is due at the beginning of the class on the due date. HW solutions will be provided after due dates. **NO LATE HW WILL BE ACCEPTED!** Any questions about the grading should be addressed to the instructor, not the TA, within one week after it's been returned.

TENTATIVE LECTURE, HW, QUIZ, and LAB SCHEDULE

Date	HQL	Reading Materials
9/3		
9/8		
9/10		
9/15		Particle Kinematics
9/17		Particle Kinematics
9/22	H1	Particle Kinematics
9/24	Q1L12	Particle Kinematics
9/29	H2	2D Rigid Body Kinematics
10/1	Q2	2D Rigid Body Kinematics
10/6	H3	2D Rigid Body Kinematics
10/8	Q3	2D Rigid Body Kinematics
10/13	H4	Particle Kinetics f=ma
10/15	Q4	Particle Kinetics f=ma
10/20	H5	2D Rigid Body Kinetics f=ma
10/22	Q5	2D Rigid Body Kinetics f=ma
10/27	H6L34	Particle Kinetics Work/Energy
10/29	Q6	Particle Kinetics Work/Energy
11/3	H7	2D Rigid Body Kinetics Work/Energy
11/5	Q7	2D Rigid Body Kinetics Work/Energy
11/10	H8	Particle Kinetics Impulse/Momentum
11/12	Q8	Particle Kinetics Impulse/Momentum
11/17	H9 L5	2D Rigid Body Kinetics Impulse/Momentum
11/19	Q9	2D Rigid Body Kinetics Impulse/Momentum
11/24	H10	Centers of Gravity, Mass, & Centroids
11/26		**NO CLASS, Thanksgiving**
12/1	Q10	Area and Mass Moment of Inertia
12/3		**Review, Wrap-Up, Q & A**

Final Exam, T 12/8, 8:00 ~ 11:00 AM

CLASS ATTENDANCE IS STRONGLY RECOMMENDED

Exam and Grading Policy : 10 HW assignments and quizzes, 5 labs, and a three-hour comprehensive final exam will be given on the dates shown on the attached tentative schedule. One lowest HW and quiz will be dropped, for no reason. (Lab#1 is optional, i.e. it can be dropped as well at your request.) There will be **NO make-up quizzes**. The final course grade will be a weighted average of:

9 HW assignments	18 %
9 Quizzes	36 % (close book/notes)
4 or 5 Lab Reports	30 %
Final Exam (comprehensive)	16 % (open one page)

>90--4, >80--3, >70--2, >60--1, <50--0. Again, any questions about the grading of exams should also be addressed to the instructor, not the TA, within one week after it's been returned.

Objectives : By the end of the course, the successful student will be able to: (letters between parentheses show mapping to ABET program outcomes)

1. Determine the internal forces in the members of a truss, frame and machine. (a,b,d, f, g, k)
2. Express graphically and analytically the axial, shear, and bending moment in load bearing structures. (a,e)
3. Determine the forces load-bearing cables. (a,e)
4. Apply the concept of dry friction in order to determine the equilibrium forces acting on wedges, screws, belts, and bearings. (a,b, d, f, g, k)
5. Determine the location of the center of gravity and centroid for a system of discrete particles and a body of arbitrary shape. (a,e)
6. Determine the moment of inertia for an area with respect to a given axis. (a,e)
7. Apply the the principle of virtual work in order to determine the equilibrium configuration of a series of pin-connected members. (a,e)
8. Apply principles of kinematics to determine the position, angular velocity, and angular acceleration associated with the planar motion of rigid bodies. (a, e)
9. Apply Newton's 2nd Law to determine the position, angular velocity, angular acceleration, and forces associated with the planar motion of rigid bodies (a, e)
10. Apply work and energy principles to describe and analyze the position, angular velocity, angular acceleration, and forces associated with the planar motion of rigid bodies (a, e)
11. Apply impulse and momentum principles to describe and analyze the position, angular velocity, angular acceleration, and forces associated with planar motion of rigid bodies (a, e)

Academic Conduct : students are expected to read, understand, and comply with the "Academic Conduct Policy" as explained in Oakland University Undergraduate and Graduate catalogs. It may also be found on the OU website at http://www2.oakland.edu/oakland/ouportal/index.asp. Violations will be taken before the Academic Conduct Committee. Students found guilty of academic misconduct in this course will receive a grade of 0.0 in addition to any penalties imposed by the Academic Conduct Committee.

HELP ME HELP YOU!!

Prepared by / Date Prepared

Yin-ping (Daniel) Chang / September 13, 2009

Estimated ABET Category Content :

	Engineering Science	Engineering Design
Credits	3.75	0.25
%	94	6

Program Outcomes: ABET

(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environ., social, political, ethical, health, safety, manufactured ability, sustainability
(d) an ability to function on multi-disciplinary teams
(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(g) an ability to communicate effectively
(h) the broad education necessary to understand the impact of engineering solutions in a global economical, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in life-long learning
(j) a knowledge of contemporary issues
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice