

ESC 200C: ENGINEERING MECHANICS
Fall 2016

Course description: In this course, we study the statics and dynamics of particles and rigid bodies. Specific topics of interest include: forces in structures; equilibrium; equivalent systems of forces; free-body diagrams; distributed forces; centroids; centers of gravity; moments of inertia; friction forces; kinematics; and kinetics.

3 credits. Prerequisites: Ph 112 Mechanics

Required textbook: “*Vector Mechanics for Engineers: Statics and Dynamics*” (11th edition) by Ferdinand Beer, E. Russell Johnston, Jr., David Mazurek, Phillip Cornwell, Brian Self. Published by McGraw-Hill Inc. 2016.

(The ISBN-13 number for this book is: 978-0073398242.)

Class schedule: The class meets twice per week (one 2hr session and one 1hr session):

Monday 4-6 pm in Rm 104, 41 Cooper Square

Thursday 1-2 pm in Rm 506, 41 Cooper Square

Instructor: Neal Simon Kwong, Ph.D.

E-mail: nkwong@cooper.edu

Office: Rm 422, 41 Cooper Square

Office hours: Mon 6-8pm, Thurs 2-4pm, Fri 4:30-6:30pm

Homework: Homework will be assigned generally every week and will be due approximately one week from the date they are assigned at the beginning of class. You may discuss problems with your classmates but your final submission must be done individually; academic dishonesty will not be tolerated. Late homework will not be accepted unless prior arrangements are made before the due date or unless the student has a documented justifiable reason. The homework will be graded and returned, and a solution set will be posted outside of my office after the due date.

Exams: There will be one 50-min midterm exam and one 100-min final exam. Both exams are closed-book and will be administered in class. Tentative dates are October 20 and December 12. Exams will be based on lecture and homework material. Actual exam dates and specific topics to be tested will be announced in class. Only writing utensils and basic calculators will be allowed in each exam.

Tentative grading: 20% homework, 40% midterm, 40% final.

Tentative schedule

Date	Class#	Topic	Chapter
9/08	1	Introduction	1
9/12	2	Addition of forces	2
9/15	3	Equilibrium of particles	2
9/19	4	Forces and moments; vector multiplication	3
9/22	5	Couples	3
9/26	6	Simplifying systems of forces	3
9/29	7	Equilibrium of rigid bodies; free-body diagrams	4
10/03	8	Equilibrium of 2-D rigid bodies; 2-D reactions	4
10/06	9	Equilibrium of 3-D rigid bodies; 3-D reactions	4
10/10	10	Analysis of frames and machines	6
10/13	11	Centers of gravity and centroids, pt 1	5
10/17	12	Centers of gravity and centroids, pt 2	5
10/20	13	Midterm exam	1,2,3,4,6
10/24	14	Friction, pt 1	8
10/27	15	Friction, pt 2	8
10/31	16	Moments of inertia; parallel-axis theorem	9
11/03	17	Mass moments of inertia	9
11/07	18	Particle kinematics: rectilinear motion	11
11/10	19	Particle kinematics: dependent motion	11
11/14	20	Particle kinematics: curvilinear motion; nonrectangular components	11
11/17	21	Particle kinetics: Newton's 2 nd law, linear momentum	12
11/21	22	Particle kinetics: equations of motion; angular momentum	12
11/22	23	Thurs lecture moved to a Tues due to Thanksgiving Particle kinetics: work and energy	13
11/28	24	Particle kinetics: work and energy; conservation of energy	13
12/01	25	Particle kinetics: impulse and momentum	13
12/05	26	Particle kinetics: impacts	13
12/08	27	Course review	5,8,9,11-13
12/12	28	Final exam	5,8,9,11-13

Note: Shaded areas correspond to Monday lectures.