2008 Winter Semester

ENGG*1210: ENGINEERING MECHANICS I

Instructor: Dr. Hongde Zhou — Room 1341, Ext. 56990, Email: hzhou@uoguelph.ca
Office Hours: Wednesday 11:00AM – noon.

GTAs:
Lindsay LaFleur: Room 313, Ext. 53588, email: llafleur@uoguelph.ca
Rong Hu: Room 303, Ext. 52132, email: rhu@uoguelph.ca
Max Gong: Room 305, Ext. 52132, email: mgong@uoguelph.ca
Jennifer Drake: Room 318, Ext. 52132, email: jdrake@uoguelph.ca

Lectures: Room: MACN 113
Time: Tuesday and Thursday 10:00AM to 11:20AM

Tutorials:	Section 101:	Tuesday	1:30PM - 2:20PM,	MACK 315
	Section 102:	Wednesday	9:30AM - 10:20AM,	MACK 315
	Section 103:	Thursday	1:30PM - 2:20PM,	MACK 310
	Section 104:	Friday	9:30AM - 10:20AM,	MACK 314

TEXTBOOK

Hibbeler, R.C. (2007). *Engineering Mechanics: Statics and Dynamics*. 11th Edition, Pearson Prentice Hall, Upper Saddle River, NJ.

Notes on pertinent material will be posted on the web course link BlackBoard throughout the semester. A number of standard engineering mechanics books are also available in the library which may be consulted.

COURSE OBJECTIVES

This course is to introduce the basic principles of engineering mechanics with emphasis on their analysis and application to practical engineering problems. After learning this course, you should develop the ability to:

1) Solve for the resultants of any force systems
2) Determine equivalent force systems
3) Determine the internal forces in plane frames, simple span trusses and beams
4) Solve the mechanics problems associated with friction forces
5) Obtain the centroid, first moment and second moment of an area
6) Describe the motion of a particle in terms of its position, velocity and acceleration in different frames of reference
7) Analyze the forces causing the motion of a particle
8) Use the equation of motion to describe the accelerated motion of a particle
9) Apply work, energy, impulse and momentum relationships for a particle in motion
10) Describe the motion of a rigid body in different frames of reference

TENTATIVE COURSE OUTLINE

Date	Lectures	Topic	Chapters
Jan. 8	1	**Introduction** Course orientation Units, definitions and basic principles	1
Jan. 10 - 15	2	**Force Vectors** Basic vector calculations Force resolution and combination	2
Jan. 17	1	**Equilibrium of a Particles** Free body and force diagrams Equilibrium of a particle	3
Jan. 22 - 24	2	**Rigid Body Force Systems** Moment of a force about a point Moment of a force about an axis Couples Reduction of force and couple systems	4
Jan. 29	1	**Equilibrium of a Rigid Body** Internal and external forces Equilibrium of a rigid body	5 7.1
Jan. 31 - Feb. 5	2	**First Moments and Centroids** Determination by integration Centroids of a composite lines or areas Fluid pressure	9.1 to 9.3 9.6
Feb. 7 - 12	2	**Analysis of Structures** Trusses: method of joints Trusses: method of sections Forces in frames and beams	6
Feb. 14 - 26	2	**Friction** Law of friction Angles of friction Wedges	8.1 to 8.5
Feb. 28		**MIDTERM**	
Mar. 4 - 6	1.5	**Moments of Inertia** Moments of inertia by integration Polar moment of inertia Radius of gyration Parallel axis theorem Composite areas	10.1 to 10.5
Mar. 6 - 11	1.5	**Particle Kinematics** Review: rectilinear motion Curvilinear motions Relative motion Absolute dependent motion	12
Mar. 13	1	**Kinetics of a Particle: Force & Acceleration** Newton's second law: General Rectangular coordinates	13

		Normal and Tangential coordinates Cylindrical coordinates	
Mar. 18 - 20	1.5	**Kinetics of a Particle: Work & Energy** Work of a force Principles of work and energy Conservative forces and potential energy Power and efficiency	14
Mar. 20 – 25	1.5	**Kinetics of a Particle: Impulse & Momentum** Principle of linear impulse and momentum Impact Angular momentum	15
Mar. 27 - Apr. 1	2	**Planar Kinematics of a Rigid Body** Translation and rotation Relative motion analysis	16.1 to 16.3 16.5 to 16.8
Apr. 3	1	**Review**	
April 7		**FINAL EXAM (**7:00PM to 9:00PM)	

Course topics will be covered by both lectures and tutorials. The main purposes of the tutorials are twofold: 1) provide additional discussion and sample problems compatible with the lecture materials, and 2) have a more informal opportunity to explore issues and ask questions about lectures, texts and previously assigned materials which require clarification.

MARK DISTRIBUTION

Assignments:	15 %
Quizzes:	15 %
Midterm:	30 %
Final Exam:	40 %

All the quizzes, midterm and final tests will be closed-book. The quizzes will be held during the regular lecturing classes one week prior to the announcement and typically last 20 minutes. Only the best three of four quizzes will be used to calculate your final quiz mark.

The solutions to all the assignments, quizzes, midterm and final must be presented in an orderly, neat fashion. All equations used must be written in general symbol form before the specific numerical values are substituted. In some cases, a sketch should be given as part of the solutions. The answers must be underlined clearly with the appropriate units.

You may appeal any mark **within one week** after it has been reported to you with the written reasons for remarking.

You must achieve a passing grade combined with the assignments and quiz components to pass the course. If you fail to it, your final grade will be equal to that failing percentage.

Late submission of an assignment will be devalued by 50% per day. If you miss an assignment or a quiz or midterm and have an acceptable, properly written excuse, the weight of the missed component will be added to the weight of the final exam.

Please note that other university policies specified in University Undergraduate Calendar 2007/08 will be followed **strictly**.