

**School of Engineering
University of Guelph**

**COURSE ENGG*121 ENGINEERING MECHANICS I
COURSE OUTLINE WINTER 2004**

Instructor: Dr. S.C. Negi, Room 2337, School of Engineering
Dr. B. Gharabaghi, Room 214, School of Engineering

Text: Beer, F.P. and E.R. Johnston, Vector Mechanics for Engineers - Statics and Dynamics. McGraw-Hill Ryerson (Third SI Metric Edition).

References: "The Science of Architecture" videotape in Library (NA 2000.534 Vol. 1 and 2). A number of standard engineering mechanics books are available in the library which may be consulted.

Objectives:

At the completion of this course each student is expected to be able to:

1. solve for the resultant of any force system;
2. determine equivalent force systems;
3. solve for the internal forces in the members of any plane frame, beams, and of simple span trusses;
4. solve mechanics problems that involve friction forces;
5. determine 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. describe the forces causing the motion of a particle;
8. obtain the equations of motion of a particle;
9. obtain work, energy, impulse and momentum relationship for a particle in motion.

Method of Evaluation:

The final grade will be determined from the results of the final examination, two term tests and ten problem assignments. Each assignment will comprise of five problems from the text book. Late submissions will not be accepted for marking. The individual marks will be weighted as follows:

Final examination	25%
Term test 1	25%
Term test 2	25%
Assignments	25%

Term tests 1 and 2 are scheduled for **Saturdays, January 31 and March 6, 2004** from **11:00 am to 12:30 pm** in Rooms **ROZH 101** and **THRN 1200**.

Note: Students must contact the instructor within the first two (2) weeks of class if academic consideration based on religious grounds is to be requested for term tests and/or assignments. Appropriate documentation must be provided for academic consideration based on medical, psychological or compassionate grounds.

Method of Presentation:

Lectures and problem solving/tutorial periods (3-1). The tutorial periods will include problems compatible with the lecture materials to enhance understanding of the subject matter. The tutorial period is also expected to be utilized as office hours.

As in all problems oriented courses, a thorough grasp of engineering mechanics can only be obtained by doing a large number of problems. You should, therefore, regard the assigned problems as a bare minimum and it is advisable to do additional problems on troublesome topics.

Topics of Study:

1.	Systems of Forces and Moments	1.25 weeks
2.	Objects in Equilibrium	0.75 weeks
3.	Distributed Forces - Centroids	0.75 weeks
4.	Analysis of Structures	
	i. Trusses; Method of Joints; Method of Sections	0.75 weeks
	ii. Beams; Shear diagrams; Bending moment diagrams	0.75 weeks
	iii. Frames and machines	0.75 weeks
5.	Friction	0.75 weeks
6.	Second Moment of Area	0.50 weeks
7.	Kinematics of Particles	1.50 weeks
8.	Kinetics of Particles	
	i. Force and Acceleration	1.50 weeks
	ii. Work and Energy	1.00 weeks
	iii. Impulse and Momentum	1.00 weeks
9.	Systems of Particles	0.75 weeks