AMBROSE

Course Syllabus

PHY 111 MECHANICS
Fall 2009

Instructor: Dr. Leonid Braverman

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Office: TBA

Office Hours: Mon 3:00 pm - 4:00 pm, Fri 2:30 pm – 3:30 pm, or by appointment

Class Time:

Lectures: Wed, Fri 9:45 – 11:00 am, Location: A 2212

Tutorial: Mon4:00 pm – 5:50 pm, Location: A 2145

Credits: 3

Pre-Requisites: Mathematics 30

Texts: Walker, J: Fundamentals of Physics, Part 1, 8-th ed. John Wiley and Sons, Inc.

Course Description

This course is equivalent to the Physics 211 of the U of C.

The course material is grouped into three modules:

Module 1: Motion and Kinematics: Motion in one dimension, including displacement, velocity and acceleration; relative motion; graphical analysis of motion.

Module 2: Forces and Acceleration: Newton's laws of motion; vectors; statics with forces; vector kinematics; uniform circular motion and other curvilinear motion; non-inertial reference frames.

Module 3: Energy and momentum: Torque; Work and energy; gravitational energy; conservation of mechanical energy; friction; systems of particles and momentum conservation.

Course objectives

At the end of the course the student should:

      1. Understand and explain the basic concepts and laws of Kinematics and Newtonian Mechanics;

      2. be able to apply the laws of motion to particular problems.

Evaluation

Assignments	5%
Mid-term Exam	35%
Quizzes	20%
Final Exam	40%
Total	100%

Student grades are earned according to the policy of the college.

Please read the Academic Regulations Section in the *2009-2010 Ambrose University College Calendar* for policy information.

Attendance

Students are expected to attend all classes and laboratories for which they are registered. Unexcused absence may result in loss of marks or in additional assignments being required. Unexcused absences may lead to a penalty on the final grade. Where the student has been absent without permission or legitimate cause for more than one-quarter of the classes, an instructor may bar a student from writing the final examination in any course

Course Requirements

While students are encouraged to assist each other, each student must create her or his own original solution to assignments, quizzes and exams. Duplicate submissions will result in students involved receiving a zero for the submission. Further penalties may be mandated.

Examinations

The exact schedule and coverage for the three term tests will be announced in the class as the semester progresses. *The coverage may be modified from what is stated in this document.* The 3 hours final examination will be held at a time and place scheduled by the Registrar, and will be three hours long. The term tests are 1.25 hours long each. Both term and final tests are partially computer-based.

Assistance

Your instructor will be available in class, during office hours, and other times by appointment.

Important Notes

It is the responsibility of all students to become familiar with and adhere to academic policies of as are stated in the Student Handbook and Academic Calendar.

Personal information, that is information about an individual that may be used to identify that individual, may be collected as a requirement as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at privacy@auc-nuc.ca.

Although extensions to coursework in the semester are at the discretion of the instructor, students may not turn in coursework for evaluation after the last day of the scheduled final examination period unless they have received permission for a "Course Extension." Alternative times for final examinations cannot be scheduled without prior approval. Requests for course extensions or alternative examination time must be submitted to the Registrar's Office by the appropriate deadline. Course extensions are only granted for serious issues that arise "due to circumstances beyond the student's control."

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university college. Students are expected to be familiar with the policies in the current Academic Calendar and the Student Handbook that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean.

Students are advised to retain this syllabus for their records.

Weekly Schedule and Other Information

This course is taught with the lecture-tutorial mode. Plan to attend all sessions. You will be given some time in class to work on problems.

Tentative Lecture Plan

WEEK	TOPICS	READINGS
Module 1		
1	Introduction to course, the International System of Units. Kinematics in a straight line: Position, Velocity. Uniform motion. Average and Instantaneous velocity	1.1 – 1.7 2.1 – 2.5
2	Acceleration. Free fall. Applications.	2.6-2.7, 2.9-2.10
3	Vectors. Definition, magnitude and direction. Operations.	Chapter 3, notes
4	Kinematics in 2D. Projectile motion.	Chapter 4, notes
Module 2		
5	Newton's laws. Forces in Nature. Inertial frames of reference. Presentation of Newton's laws. Free- body diagram. Friction force.	5.1 – 5.9
6	Friction. Applications of Newton's laws.	6.2-6.3, notes
7	The Drag Force and Terminal Speed Circular motion. Uniform Circular Motion. Examples.	6.4-6.5, notes
8	**Midterm Exam** Work and energy. Kinetic Energy. Power.	7.1-7.7, notes
Module 3		
9	Potential Energy. Conservation of energy. Systems of interacting objects. Internal and external forces.	8.1-8.8, notes
10	Momentum, collision: systems of particles. Centre of mass. Momentum definition and conservation. Examples.	9.1-9.8, notes
11	Collisions in 1-d. Elastic and inelastic collision	9.9-9-10, notes
12	Inverse square laws: gravitational and electrical forces. Orbital motion. Escape velocities.	13.1-13.8, notes
13	Equilibrium. The requirements of equilibrium. Torque. Rotational equilibrium.	Notes