

Physics 141 – Honors Section

Fall Semester 2005

- Instructor:** Nikos Varelas
Office: 2134 SES
Email: varelas@uic.edu
Phone: (312) 996-3415
- Textbook:** *University Physics*, Volume I of 11th Edition, Young & Freedman
- Laboratory Text:** Physics 141 Laboratory Instruction Booklet (1997)
- Course web site:** <http://www.uic.edu/~varelas/phy141h.html>
- Lectures:** 9:00am - 9:50am, Mon. (SES238) Wed. (SES238) Fri. (LC E1)
- Discussion:** 1:00pm - 1:50pm, Wed. (SES238)
- Laboratory:** 2108 SEL
Tue: 8:00 - 9:50 am
Wed: 11:00 am - 12:50 pm
Thu: 8:00 - 9:50 am
- Prerequisites:** Grade of “A” in MATH 180 (Calculus I), *OR* consent of instructor.

1. Course Calendar and Assignments

The course calendar and assignments are attached. We strongly suggest that you read the appropriate material before it is discussed in class. That way you will be able to focus on the things you do not understand at first and ask relevant questions. Remember that learning is an interactive process, the instructors will be only too happy to answer your questions in class, in the discussion sections or during office hours.

It is essential to realize from the outset that the material in this course cannot be mastered simply by rote learning of facts or equations. You must concentrate on understanding the underlying principles and their application. Mathematics is the language by which the ideas of physics are expressed. If you are not comfortable with the basics of calculus you should review them at the earliest possible time and/or ask for help.

2. Laboratory

The laboratory is an integral part of the course. Physics is an experimental science and the laboratory work will give you insight into the phenomena that are discussed in class. Attendance at all laboratory meetings and submission of completed laboratory reports is

mandatory. It will not be possible to pass the course without completion of the laboratory requirement. The laboratory manual is designed to allow you to complete the required experimentation and analysis within the two-hour laboratory session. All reports **must** be handed-in to the lab TA at the end of each session. Consequently, you should be prepared for the lab before you walk in.

3. Homework

The homework is an essential part of the course. It is the method by which you get feedback on your comprehension of the material. It is therefore very important that you spend time working on understanding the problems. In case of difficulty, please contact the instructor, tutor or laboratory TA for help. Working together in a group is often a useful way of tackling difficult problems.

The homework assignments are due on the Wednesday of the week following the assignment. They should be handed in at the end of class. They should be clearly identified with your name, ID#, and the names of the instructor and grader.

To obtain the maximum credit, please arrange your work neatly with carefully drawn diagrams and clear definitions of quantities. Answers should, of course, include units where appropriate.

Solutions to the homework problems will be available on the web at the end of the week following the due date.

4. Examinations

Three examinations will be given during the course of the semester. Mid-term examinations are tentatively scheduled during the weeks of September 26th and October 31st respectively. The third examination will be given during finals week at a time to be scheduled later. It is your responsibility to be available for all examinations.

5. Grade Credit Distribution

Grades will be based on the following credit distribution:

Exam I	20%
Exam II	20%
Final Exam	30%
Homework/Quizzes	15%
Laboratory	15%

A grade of incomplete (IN) is given only in very exceptional cases and is to be requested in writing. Such a request must be signed, dated, and supported by **facts** relating to this unfortunate situation. An incomplete grade is **not** given for missing laboratory reports.

6. Students with Disabilities

Students with disabilities who require accommodations for access and participation in this course must be registered with the Office of Disability Services (ODS). Please contact ODS at (312) 413-2183 (voice) or (312) 413-0123 (TTY). Also, students with disabilities should make themselves known to the instructor as soon as possible.

PHYSICS 141 Honors
Fall 2005 – Course Outline

WEEK	CHAPTER SECTIONS	TOPICS	HOMEWORK	LABORATORY
1 Aug 22 nd	<u>Chapter 1</u> 1.1 to 1.10	<u>Units and Vectors</u> Standards, Units and Conversions Uncertainty and Significant Figures Orders of Magnitude, Estimating Vectors – Addition, Components, Unit Vectors, Products	Due: Aug. 31st	<i>No Lab Scheduled</i>
2 Aug 29 th	<u>Chapter 2</u> 2.1 to 2.6	<u>Motion in One Dimension</u> Displacement, Time Average Velocity Instantaneous Velocity Acceleration Motion with Constant Acceleration Freely Falling Bodies Velocity and Position by Integration	Due: Sep. 7th	<i>Experiment 1 Kinematics of motion in one dimension</i>
3 Sep 5 th	<u>Chapter 3</u> 3.1 to 3.5	[Sept. 5: No class, Labor Day] <u>Motion in Two or Three Dimensions</u> Position and Velocity Vectors Acceleration Vector Projectile Motion Circular Motion Relative Velocity	Due: Sep. 14th	<i>Experiment 2 Vector addition in Two Dimensions</i>
4 Sep 12 th	<u>Chapter 4</u> 4.1 to 4.6	<u>Newton's Laws of Motion</u> Force and Interactions Newton's First and Second Law Mass and Weight Newton's Third Law Free-Body Diagrams	Due: Sep. 21st	<i>Experiment 3 Projectile Motion</i>
5 Sep 19 th	<u>Chapter 5</u> 5.1 to 5.5	<u>Applying Newton's Laws</u> Particles in Equilibrium Dynamics of Particles Frictional Forces Dynamics of Circular Motion The Fundamental Forces of Nature	Due: Sep. 28th	<i>Experiment 4 Relationship of Force to Mass</i>
6 Sept. 26 th EXAM I Sept 28 th 6-8pm	<u>Chapter 6</u> 6.1 to 6.4	<u>Energy and Kinetic Energy</u> Work and Kinetic Energy Work with Varying Forces Power	Due: Oct. 5th	<i>Lab Make-up Session</i>
7 Oct 3 rd	<u>Chapter 7</u> 7.1 to 7.5	<u>Potential Energy and Energy Conservation</u> Gravitational and		<i>Experiment 7 Work Energy</i>

		Elastic Potential Energy Conservative and Nonconservative Forces Force and Potential Energy Energy Diagrams	Due: Oct. 12th	<i>Theorem in Two Dimensions</i>
8 Oct 10 th	<u>Chapter 8</u> 8.1 to 8.6	<u>Momentum, Impulse and Collisions</u> Momentum and Impulse Conservation of Momentum Elastic and Inelastic Collisions Center of Mass Rocket Propulsion	Due: Oct. 19th	<i>Lab Make-up Session</i>
9 Oct 17 th	<u>Chapter 9</u> 9.1 to 9.6	<u>Rotation of Rigid Bodies</u> Angular Velocity and Acceleration Rotation with Constant Angular Acceleration Linear and Angular Kinematics Energy in Rotational Motion Parallel-Axis Theorem Moment of Inertia Calculations	Due: Oct. 26th	<i>Experiment 6 Impulse</i>
10 Oct. 24 th	<u>Chapter 10</u> 10.1 to 10.4	<u>Dynamics of Rotational Motion</u> Torque Rigid-Body Angular Acceleration Rigid-Body Rotation about a Moving Axis Work and Power	Due: Nov. 2nd	<i>Experiment 5 Conservation of Momentum</i>
11 Oct 31 st EXAM II Nov 2 nd 6-8pm	<u>Chapter 10</u> 10.5 to 10.7	<u>Dynamics of Rotational Motion</u> Conservation of Angular Momentum Gyroscopes and Precession	Due: Nov. 9th	<i>Lab Make-up Session</i>
12 Nov 7 th	<u>Chapter 11</u> 11.1 to 11.5	<u>Equilibrium and Elasticity</u> Conditions for Equilibrium Center of Gravity Rigid-Body Problems Stress, Strain and Elastic Moduli Elasticity and Plasticity	Due: Nov. 16th	<i>Experiment 9 Rigid Body Rotation</i>
13 Nov 14 th	<u>Chapter 12</u> 12.1 to 12.8	<u>Gravitation</u> Newton's Law of Gravitation Weight Gravitational Potential Energy The Motion of Satellites Kepler's Laws Spherical Mass Distributions Apparent Weight and the Earth's Rotation Black Holes	Due: Nov. 23rd	<i>Experiment 10 Conservation of Angular Momentum</i>
14 Nov 21 st	<u>Chapter 13</u> 13.1 to 13.8	<u>Periodic Motion</u> Describing Oscillations		<i>No Lab Scheduled</i>

		Simple Harmonic Motion Energy in SHM Applications of SHM The Simple Pendulum The Physical Pendulum Forced Oscillations and Resonance [No class, Thanksgiving Holiday]	Due: Nov. 30th	
15 Nov 28 th	Chapter 15 15.1 to 15.8	Types of Mechanical Waves Periodic Waves Mathematical Description of a Wave Speed of a Transverse Wave Energy in Wave Motion Wave Interference Standing Waves on a String Normal Modes of a String	No homework assigned	<i>Experiment 11 Simple Harmonic Motion</i>
16 Dec 5 th		FINALS WEEK (Final Exam date and time to be announced)		

*All exams are “closed book” and it is the student’s responsibility to be present at the scheduled time. Textbooks, cell phones, symbolic calculators or any other forms of wireless communication are strictly prohibited in an exam. Giving or receiving aid in an examination is cause for dismissal from the University. Any other violation of academic honesty can have the same effect.