

Introductory Physics II [PHY 142] Spring 2006 Syllabus

Instructor

Douglas Young

Instructor Contact Information

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Instructor Office Hours

Tuesday/Thursday 11:00-12:00

Required Texts

Physics,

by James S. Walker

ISBN: 0-13-101416-1

Ranking Task Exercises in Physics

by Thomas L. O'Kuma, David P. Maloney, and Curtis J. Hieggelke

ISBN: 0-13-144851-X

Meeting Rooms and Times

Section 001: MF 1:00-1:50 WSC Lecture Hall

T 6:00-6:50 WSC 101

Section 002: MF 1:00-1:50 WSC Lecture Hall

R 6:00-6:50 WSC 101

Corequisites

Introductory Physics Lab II [PHY 142L]

Prerequisites

Introductory Physics I [PHY 141 or equivalent]

Students are expected to be able to:

- Solve algebraic expressions.
- Manipulate, and solve, trigonometric, quadratic, polynomial, exponential, and logarithmic expressions.
- Solve problems involving vector quantities.
- Solve kinematic problems.
- Solve problems involving forces in both static ($F_{net} = 0$) and dynamic ($F_{net} \neq 0$) situations.
- Solve problems involving energy conservation.
- Be familiar with terms typically discussed in the first semester of an introductory physics course (i.e. force, energy, mass, velocity, acceleration, ect.), know the dimensional units for these terms, and how these terms are related to each other.

Course Objectives

At the end of this course, students will:

- Be able to solve quantitative problems by applying physical principles.
- Be able to analyze a physical system and make qualitative predictions about the behavior of the system.
- Have developed problem-solving skills that apply to other situations.
- Have developed an understanding of how the physical world around them operates.
- Know typical terminology used in the sciences (i.e. Electric Field, Voltage, Current, Capacitance, Induction, etc.), what the dimensional units for these terms are, and how these terms are related.

Topics Covered

Electric Charge and Electric Fields, Electric Potential Energy, Early Quantum Theory, Capacitance, Electric Currents, Magnetism, Electromagnetic Induction and Faraday's Law, Electromagnetic Waves, Elasticity, Simple Harmonic Motion, Vibrations and Waves, Sound, Interference and Diffraction of Light, Quantum Mechanics of Atoms, Nuclear Physics and Radioactivity, Nuclear Energy.

Tentative Schedule of Topics

Elasticity: Stress and Strain Periodic Motion Waves and Sound Wave Optics	
Test I	Tentatively: Friday, February 11
Electric Charge and Electric Fields Electric Potential and Capacitance Electric Current and Resistance	
Test II	Tentatively: Friday, March 4
Magnetism Electromagnetic Induction	Chap.
Test III	Tentatively: Friday, April 8
Atomic Structure Quantum Theory Nuclear Physics	
Test IV	Tentatively: Friday, May 6 2:00-5:00

Note: This selection and scheduling of material is tentative and subject to change at the discretion of the instructor.

Grading Scale

100	-	90	=	A	(4.0)
89	-	85	=	B+	(3.5)
84	-	80	=	B	(3.0)
79	-	75	=	C+	(2.5)
74	-	70	=	C	(2.0)
69	-	60	=	D	(1.0)
		≤ 59	=	F	(0.0)

Grading

Weighting

- Daily Class Work/Participation 7 %
 - Reading Quizzes 7 %
 - Tutorial Sessions 15 %
 - Tests 71 %
- 4 Tests \implies 20 % for highest test grade and 17 % for all others

Daily Class Work/Participation

Daily class work will consist of conceptual and quantitative problems worked in, or out of, class, and turned in as assigned by the instructor. This work will be assigned a score of a check-plus ($\sqrt{+} = 3$), check ($\sqrt{=} = 2$), or check-minus ($\sqrt{-} = 1$). Assignments will typically be scored based on the effort made by the student to solve the problem, rather than purely on if the problem is right or wrong. Based on this scale, a check on an assignment is equivalent to a 100 (on a 100 point scale); Check-pluses therefore constitute a form of extra-credit. In figuring the final grade, averages over 100 on this part will be scored as a 100. However, students with averages of over 100 on this part of the grade may have their final grades increased by 2 points if it puts the student in the next letter grade bracket.

For example, suppose a student earns a 108 on the Daily Class Work part of the grade. The final grade for this student will be calculated with a 100 as the average value for the Daily Class Work part of the grade. Suppose that, after calculating the final grade, an 83.2 is obtained. This would give the student a B in the course. However, because the student is within two points of a B+, and has over a 100 on the Daily Class Work part of the grade, the instructor would award the student a B+ as the final grade.

When assigned *conceptual* problems, students are expected to provide a clear answer to the question, the reasoning behind their answer, and an indication of how sure they are of their answer. Typically the “sureness” scale is from 1 to 10 with 1 meaning “basically guessed”, 5 or 6 as “sure”, and 10 as “very sure”. ***Without all three present on the page, a problem solution will be scored as a check-minus ($\sqrt{-} = 1$) regardless if the answer is right or wrong.*** This is not required on quantitative (calculation) problems. Quantitative problems typically have a numeric answer, while qualitative problems involve some type of relationship between to objects or events.

Specific instructions may also be given for particular assignments relating to the scoring for that assignment. In addition, students are expected to participate in class discussions about these conceptual and quantitative problems. An additional credit may be awarded (i.e. a check-minus increased to a check, or a check increased to a check-plus) for strong class participation on a particular assignment. Students are expected to use the check-pluses to make up for absences due to illness, family emergencies, ect.

Reading Quizzes

Short quizzes upon assigned readings from the textbook will be given periodically. The assigned reading will be announced in class prior to the quiz. These quizzes will be conceptual in nature. Students will not be allowed to use any notes or calculators for these quizzes. These quizzes will be graded on a standard 100 point grading scale. Typically, around 10 reading quizzes will be given during the semester; each quiz therefore represents about 0.7% of the total grade. This means that doing poorly on one quiz will not harm a students grade, but doing poorly on the bulk of the quizzes will. Quizzes will take between 10 to 20 minutes of class time.

Tutorial Sessions

On Tuesday or Wednesday evenings, depending on which section the student is enrolled in, tutorial sessions will be held. These sessions are intended to allow students to work in small groups on assignments given out during these sessions. For some assignments during these sessions, students may also be asked to work alone. These sessions are designed to give students more individual attention than they would otherwise receive during the standard (large) lecture session. As with the Daily Class work, these assignments will also primarily be graded on a $\checkmark + / \checkmark / \checkmark -$ system. Students are expected to use the 3 point option to make up for absences due to illness, family emergencies, etc. In addition, some of the assignments will be graded on a 0 to 10 point scale at the discretion of the instructor.

Tests

Tests will typically consist of several questions with multiple parts. Approximately half the problems will be conceptual, with the rest as quantitative problems. Tests will be announced ahead of time. A formula sheet will be provided (students may not bring one of their own). Students will be given the whole period (~ 50 min.) to complete the test.

Comprehensive Final

During the Finals period, students will be given the option of taking a comprehensive final to replace the lowest of their first three test grades. Note that this final can not be used to replace the fourth test. The comprehensive final will cover material all material except that covered on the fourth test. Both the fourth test and the comprehensive final will be taken during the Finals period.

Class Policies

- The instructor reserves the right to modify this syllabus as deemed necessary any time during the semester. Emendations to the syllabus will be discussed and negotiated with students during a class period. A revised syllabus which supercedes the original document will then be handed out in a class period shortly after the discussion/negotiation class period.
- Attendance in this class is extremely important. Students are responsible for all information discussed in class. Be forewarned that students with more than an occasional absence risk doing poorly. If a student knows in advance that a class will be missed, it is expected that the student will discuss this with the instructor.
- Dates for tests and quizzes will be announced one class period ahead of time (i.e. there will be no “pop” quizzes or tests).
- A formula sheet will be provided for all quizzes and tests. The formula sheet will be posted on the class webpage (physics.mercer.edu/young/phy142-S06/phy142.htm).
- Practice problems will be assigned by will not be collected. Solutions to these problems will also be posted on the class webpage (physics.mercer.edu/young/phy142-S06/phy142.htm).

- Students are *highly encouraged* to attempt to work out the homework problems themselves *before* consulting the solutions.
Memorizing homework solutions will not help you on quizzes or tests.
- Cell Phone and Pager Usage: Out of courtesy for all those attending the class, all cell phones and pagers must be turned off before entering any classroom, lab, or formal academic or performance event.
- Students are expected to treat each other courteously. Racial and gender slurs will not be tolerated.
- Questions about points awarded on test and quiz problems should be brought up as soon as these materials are handed back to students. All grades are final four weeks after tests and quizzes have been handed back to the class. If a student is not present in class when materials are returned, the student is responsible for arranging a time to collect the work from the instructor.
- Makeup tests will be administered for excused absences only, and must be made up within one week of the date when the test or quiz was administered to the class. If a student knows in advance that a test or quiz will be missed, it is expected that the student will discuss a makeup time beforehand.
- For unexcused absences (absences not approved by the Dean's office), daily class work cannot be made up. Examples of unexcused absences include illness, family emergencies, etc. It is expected that students will use check-plus scores to make up for scores of zero on days the student is absent.
- The College of Liberal Art's academic policy will be followed. The Mercer University Honor Code binds all students. Any student caught cheating will be brought before the Honor Council. Students are encouraged to discuss the problems together, but all work submitted for a grade should be the sole product of the student that submitted the work.
- Students with a documented disability should inform the instructor at the close of the first class meeting. The instructor will refer you to the office of Student Support Services (SSS) for consultation regarding evaluation, documentation of your disability, and recommendations for accommodation, if needed. Students will receive from SSS the Faculty Accommodation Form. On this form SSS will identify reasonable accommodations for this class. The form must be given to the course instructor for signature and then returned to SSS.
- To take full advantage of disability services, it is recommended that students contact the Office of Student Support Services, immediately. The office is located on the third floor of the Connell Student Center.