

PH 105 Section 006: General Physics W/Calc I

Fall, 2010 4 Credit Hours

Primary Instructor: Ronald Buta
Core Designation: Natural Science

Syllabus subject to change.

Office Hours

9-11:30am W

Prerequisites

From the Student Records System

MATH 125 (undergrad) with a minimum grade of D-
Or
MATH 145 (undergrad) with a minimum grade of D-

Course Description

The course is focussed on solving basic problems in mechanics and thermodynamics. Regular homework will be assigned through WebAssign, an on-line service that students must individually register for. The class will be lecture style and will feature in-class demonstrations related to the topics under discussion. Additionally, clickers will be used to allow class participation and interaction.

The lecture-format class will meet Tuesday and Thursday from 3:30-4:45pm in Room 200 Gallalee Hall. The lab associated with this specific class will be taught by a TA and will meet on Thursday from 8:00-9:50pm in Room 203 Gallalee Hall.

Objectives

The main objectives of PH105 are to give students a basic qualitative and quantitative understanding of classical mechanics and thermodynamics, and to provide the necessary background for taking PH106 (or PH102).

After taking PH105 you should be able to

- recognize and explain the scientific method, and evaluate scientific information.
- answer conceptual questions which require a solid understanding of forces and kinematics.
- solve problems in classical mechanics and thermodynamics using both differential and integral calculus.
- apply the concept of conservation of energy to relevant problems.
- apply Newton's Laws to relevant problems.
- apply the laws of physics to formulate a solution to a problem.
- analyze the motion of a mass under the influence of multiple forces.
- solve problems which require application of the laws of thermodynamics.

Outline of Topics

- Aug. 19 - Chapter 1: Introduction
- Aug. 24 - Chapter 2: Motion in one dimension: 2.1-2.5
- Aug. 26 - Chapter 2: Motion in one dimension: 2.5-2.8
- Aug. 31 - Chapter 4: Motion in two dimensions: 4.1-4.3
- Sept. 2 - Chapter 4: Motion in two dimensions: 4.4-4.5, 5.1-5.3
- Sept. 7 - Chapter 5: The laws of motion: 5.4-5.6
- Sept. 9 - Chapter 5: The laws of motion: 5.7-5.8
- Sept. 14 - Chapter 6: Circular motion: 6.1-6.4
- Sept. 16 - Chapter 7: Work and energy: 7.1-7.4
- Sept. 21 - Chapter 7: Work and energy: 7.5-7.8
- Sept. 23 - Exam 1, chapters 1-7
- Sept. 28 - Chapter 8: Conservation of energy: 8.1-8.5
- Sept. 30 - Chapter 9: Momentum and collisions: 9.1-9.4
- Oct. 5 - Chapter 9: Momentum and collisions: 9.5-9.8
- Oct. 7 - Chapter 10: Rotation of a rigid object: 10.1-10.4
- Oct. 12 - Chapter 10: Rotation of a Rigid Object: 10.5-10.9
- Oct. 14 - Chapter 11: Angular momentum: 11.1-11.5
- Oct. 19: Chapter 13: Universal gravitation: 13.1-13.6
- Oct. 21 - Chapter 14: Fluid Mechanics: 14.1-14.6
- Oct. 26 - Exam 2, chapters 8-14 (excluding Chapter 12)
- Oct. 28 - Chapter 15: Oscillatory motion: 15.1-15.4
- Nov. 2 - Chapter 15: Oscillatory motion: 15.5-15.7
- Nov. 4 - Chapter 16: Wave motion: 16.1-16.6
- Nov. 9 - Chapter 17: Sound waves: 17.1-17.4, 18.1-18.2
- Nov. 11 - Chapter 18: Superposition and standing waves: 18.3-18.8
- Nov. 16 - Chapter 19: Temperature: 19.1-19.5
- Nov. 18 - Fall Break; no class
- Nov. 23 - Chapter 20: First law of thermodynamics: 20.1-20.7
- Nov. 30 - Chapter 21: Kinetic theory of gases: 21.1-21.5, 22.1-22.2

Dec. 2 - Chapter 22: Entropy and Second Law of Thermodynamics: 22.3-22.8

Exams and Assignments

There will be two in-class exams as follows:

Exam 1, chapters 1-7 of text: Sept. 23

Exam 2, chapters 8-11,13-14 of text: Oct. 26

The final exam will have two parts: Part 1: covering topics in Chapters 15-22, and Part 2: a comprehensive exam on Chapters 1-13 (excluding Chapter 12).

Date of Final Exam: Thursday, December 9, 7-9:30pm, Room 200 Gallalee Hall

All exams will be a mix of regular problem-solving and conceptual questions, and will be graded in a multiple choice format. For each exam there will be a study guide to provide some focus since the amount of material is so large.

Homework problems will be assigned weekly (usually on Tuesday) and will be due on the following Tuesday by noon. Late homework will not be accepted. The solutions are submitted through the online service called WebAssign (<http://webassign.net/>). Students have to enroll in this service, and can do so online. On this page choose "I have a class key" and use the following to gain access:

ua 2197 6433

Each part goes in a single box. This is only done once. You are then asked to verify that the class is the correct one. After this, specify your bama username as your preferred username, choose a password, fill in your name and email address, and use your CWID as your Student ID Number. Thereafter you can use the normal login process and access the homework problems.

Students are expected to keep a notebook showing the work they used to arrive at their answers, and to be prepared to turn it in for spot grading as requested. That is, each student should keep a record of problem solutions and should submit their own answers. WebAssign does not give exactly the same questions to each student.

Regular in-class quizzes, often of a conceptual nature, will be given almost every class period using the clickers from TurningPoint Technologies. These are available at the UA Supply Store (and other local bookstores) and cost \$52 new and \$39 used. The clicker comes with a lifetime user's license. An explanation of how these clickers are used is provided on

<http://frc.ua.edu/wpcontent/uploads/2009/09/ttstudentguide.pdf>

To use your clicker, you must register it for the class. This is done on the class eLearning website which you can access through mybama.ua.edu. Find the class in the eLearning section and in the left bar click on "Course Content." There you will see an icon labeled "Register Clicker Here." There is no extra charge for registering the clicker. Please get your clicker by Tuesday, August 24. The Response Device ID is the 6-digit ID under the barcode on the back of your clicker.

The receiver in Rom 200 is on Channel 1. To register your responses in this room, you must change your clicker to this channel. To change channels:

- press menu
- press "yes" (down button) until "Change Channel" is highlighted
- press "Enter"
- Type "1"
- press "Enter"

- you should see "Channel Changed," "Receiver Found"

- use a similar procedure to set the clicker for "Presentation Mode": Menu--> Yes -->"Presentation" --> Enter. You should see "Presentation Mode, Channel 1". To test this, press any number key. You should see "Not accepting answers!" If you see "Sending ... No receiver on channel XX within range," then you are on the wrong channel.

Grading Policy

Thursday night lab: 20%

Homework: 15%

In-class clicker quizzes: 10%

Exam 1: 15%

Exam 2: 15%

Final exam: 25%

Policy on Missed Exams & Coursework

There will be no makeup exams or makeup homework. If for some reason you miss an in-class exam, the final exam will count more to make up for it.

Attendance Policy

There is only one way to take this class, and that is: SERIOUSLY. Being serious means attending class on its scheduled days, and being there when the class is supposed to start and staying in the class until it is finished for the day. Late arrivals or early departures are disruptive practices that should be avoided. If you miss classes you will miss the in-class clicker quizzes, which is not recommended because they will be given almost every class period. However, the two lowest clicker quiz scores will be dropped to have some flexibility in this matter. Another reason for regular attendance is that we cannot cover all the topics in the textbook, and if you miss classes you will not be able to keep up with the topics that actually are covered.

Required Texts

UA Supply Store Textbook Information

- **NONE / RESPONSE PAD XR (XRC-01)**
(Required)
- **SERWAY (BEST VALUE) / PHYSICS FOR SCI & ENG (includes volume 1 & 2)**
(Choose One)
- **SERWAY (BEST VALUE) / PHYSICS FOR SCI & ENG VOL 1**
(Choose One)

Physics for Scientists and Engineers Vol. I by Serway and Jewett 7th edition

It is expected that students will read the scheduled textbook sections BEFORE class in order to be prepared for the topics to be discussed. These sections are listed in the outline of topics.

Other Course Materials

There are no course materials needed other than the textbook, a TurningPoint Technologies clicker, and registration for WebAssign.

Extra Credit Opportunities

Possible opportunities for extra credit will be mentioned later in the semester.

Disability Statement

If you are registered with the Office of Disability Services, please make an appointment with me as soon as possible to discuss any course accommodations that may be necessary. If you have a disability, but have not contacted the Office of Disability Services, please call 348-4285 or visit 133-B Martha Parham Hall East to register for services. Students who may need course adaptations because of a disability are welcome to make an appointment to see me during office hours. Students with disabilities must be registered with the Office of Disability Services, 133-B Martha Parham Hall East, before receiving academic adjustments.

Policy on Academic Misconduct

All students in attendance at the University of Alabama are expected to be honorable and to observe standards of conduct appropriate to a community of scholars. The University expects from its students a higher standard of conduct than the minimum required to avoid discipline. Academic misconduct includes all acts of dishonesty in any academically related matter and any knowing or intentional help or attempt to help, or conspiracy to help, another student.

[The Academic Misconduct Disciplinary Policy](#) will be followed in the event of academic misconduct.

Severe Weather Protocol

In the case of a tornado warning (tornado has been sighted or detected by radar; sirens activated), all university activities are automatically suspended, including all classes and laboratories. If you are in a building, please move immediately to the lowest level and toward the center of the building away from windows (interior classrooms, offices, or corridors) and remain there until the tornado warning has expired. Classes in session when the tornado warning is issued can resume immediately after the warning has expired at the discretion of the instructor. Classes that have not yet begun will resume 30 minutes after the tornado warning has expired provided at least half of the class period remains.

UA is a residential campus with many students living on or near campus. In general classes will remain in session until the National Weather Service issues safety warnings for the city of Tuscaloosa. Clearly, some students and faculty commute from adjacent counties. These counties may experience weather related problems not encountered in Tuscaloosa. Individuals should follow the advice of the National Weather Service for that area taking the necessary precautions to ensure personal safety. Whenever the National Weather Service and the Emergency Management Agency issue a warning, people in the path of the storm (tornado or severe thunderstorm) should take immediate life saving actions.

When West Alabama is under a severe weather advisory, conditions can change rapidly. It is imperative to get to where you can receive information from the [National Weather Service](#) and to follow the instructions provided. Personal safety should dictate the actions that faculty, staff and students take. The Office of Public Relations will disseminate the latest information regarding conditions on campus in the following ways:

- Weather advisory posted on the UA homepage
- Weather advisory sent out through Connect-ED--faculty, staff and students ([sign up at myBama](#))
- Weather advisory broadcast over WVUA at 90.7 FM
- Weather advisory broadcast over Alabama Public Radio (WUAL) at 91.5 FM
- Weather advisory broadcast over WVUA 7. WVUA 7 Storm Watch provides a free service you can subscribe to that allows you to receive weather warnings for Tuscaloosa via e-mail, pager or cell phone. Check <http://www.wvua7.com/stormwatch.html> for details.