

University of North Alabama
Fall 2011

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| <u>Course</u> | <u>PH 251 Technical Physics I</u> | | |
| <u>Credit</u> | Five semester hours | | |
| <u>Class Times</u> | Lecture: M,W,TH,F at 10-10:50 Lab: M at 4-5:50 or 6:00-7:50 | | |
| <u>Textbook</u> | Physics for Scientists and Engineers 8 th ed. By Serway & Jewett | | |
| <u>Instructor</u> | Dr. D. Brian Thompson | | |
| <u>Office</u> | FSB 219 | | |
| <u>Telephone</u> | 765-4881 | | |
| <u>Email</u> | <u>dbthompson@una.edu</u> | | |
| <u>Office Hours</u> | M | 8:30 to 9:00 & 1:00 to 2:00 | |
| | T | 8:30 to 9:00 & 11:00 to 12:00 | |
| | W | 8:30 to 9:00 & 1:00 to 2:00 | |
| | R | 8:30 to 9:30 | |
| | F | 8:30 to 9:00 & 1:00 to 2:00 | |

Course This calculus-based physics course covers mechanics. It is required for preengineering, physics, General and professional chemistry, and industrial hygiene.

Learning Objective Upon Completion of this course, students will

- Demonstrate comprehension of the essential ideas of unifying concepts associated with particle and wave motion
- Apply expert problem-solving strategies to address quantitative questions about these topics
- And apply these same strategies to address qualitative questions about these topics

Physics Education Majors:

Objectives:

Students will demonstrate knowledge of

physics including, sound, , energy, and thermodynamics. 290-3-3-.15(1)(a)2.(ii) [partial fulfillment of 290-3-3-.15(1)(a)2.(ii); See Technical Physics II, PH 252 for content and assessment of light, optics, electricity, and magnetism.]

physics, including energy, motions and forces. 290-3-3-.15(1)(b)2.(iii) [partial fulfillment of 290-3-3-.15(1)(b)2.(iii)—See Technical Physics II, PH 252, for content and assessment of properties and functions of waves, electricity, and magnetism. See Modern Physics, PH 343, syllabus for content and assessment of stellar evolution.

physics, including, forces and motion, energy, thermodynamics, sound; 290-3-3-.15(1)(c)2.(iii) [partial fulfillment of 290-3-3-.15(1)(c)2.(iii) --See Technical Physics II, PH 252, for content and assessment of electricity, magnetism, and optics. See Modern Physics, PH 343, for content and assessment of quantum theory.]

energy, work, and power. 290-3-3-.15(1)(d)1.(i)

motion, major forces, and momentum. 290-3-3-.15(1)(d)1.(ii)

Newtonian principles and laws including engineering applications. 290-3-3-.15(1)(d)1.(iii)

conservation of mass, momentum, energy, and charge. 290-3-3-.15(1)(d)1.(iv)

physical properties of matter. 290-3-3-.15(1)(d)1.(v)

wave theory, sound, light, the electromagnetic spectrum. 290-3-3-.15(1)(d)1.(viii)

fundamental processes of investigating in physics. 290-3-3-.15(1)(d)1.(x)

thermodynamics and relationships between energy and matter. 290-3-3-.15(1)(d)1.(xiii)

angular rotation and momentum, centripetal forces, and vector analysis. 290-3-3-.15(1)(d)1.(xiv)

Content: Topics are listed below in Course Content: 290-3-3.14 (1)(a)4(i)

Course Requirements: Students will demonstrate understanding of problems and solutions related to these topics through collaborative work and independent assessment. 290-3-3-.15(1)(a)2.(ii); 290-3-3-.15(1)(b)2.(iii); 290-3-3-.15(1)(c)2.(iii)—partial fulfillment; 290-3-3-.15(1)(d)1.(i); 290-3-3-.15(1)(d)1.(ii); 290-3-3-.15(1)(d)1.(iii); 290-3-3-.15(1)(d)1.(iv); 290-3-3-.15(1)(d)1.(v); 290-3-3-.15(1)(d)1.(viii); 290-3-3-.15(1)(d)1.(x); 290-3-3-.15(1)(d)1.(xiii); 290-3-3-.15(1)(d)1.(xiv)

Course Content Topics Include:

Vectors, One Dimensional Motion, Two Dimensional Motion, Newton's Laws of Motion, Circular Motion, Energy of a System, Conservation of Energy, Linear Momentum and Collisions, Oscillations, and Waves.

Assessment: Students' knowledge of the course content and each of the stated objectives will be assessed in exam procedures, mid-term or final, or in laboratory reports or exams.

Course Grading

The list of exercises, along with each exercise's contribution to the final grade, is listed below.

Laboratory.....100 points
Reading Quizzes, Take-Home Quizzes, Homework.....200 points

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|---------------------|-----------------------|
| In-Class Exams..... | 600 points |
| Final Exam..... | 100 points |
| Mid-Term Exam..... | up to 30 bonus points |

The numerical grade for the semester, obtained using the percentage components listed above, will then be converted to a letter grade for the course according to the following table:

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|----------------------|---|
| 900-1000 points..... | A |
| 800-899 points..... | B |
| 700-799 points..... | C |
| 600-699 points..... | D |
| >600 points..... | F |

In case of school closures due to snow, hurricanes, etc., we may not be able to collect all points during the semester. In that case, the grades will be scaled according the points available.

Course Policies

Class Attendance:

Students are expected to attend all class meetings, and to have read and worked on assigned material beforehand in order to participate fully in class discussions. Missed laboratories cannot be made up.

Homework assignments and reading quizzes will be assigned via the internet. To download and complete homework assignments and reading quizzes, students must have access to the internet. Instructions for accessing these items appear on the next page. If you have difficulty accessing the internet assignments, *see me as soon as possible so that we can make alternative arrangements.*

Academic integrity:

The instructor assumes absolutely the academic integrity of students. However, any student found cheating on an exam will be assigned a final grade of “F” for the course.

Accommodation Statement:

In accordance with the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973, the University offers reasonable accommodations to students with eligible documented learning, physical and/or psychological disabilities. Under Title II of the Americans with Disabilities Act (ADA) of 1990, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Amendment Act of 2008, a disability is defined as a physical or mental impairment that substantially limits one or more major life activities as compared to an average person in the population. It is the responsibility of the student to contact Disability Support Services to initiate the process to develop an accommodation plan. This accommodation plan will not be applied retroactively. Appropriate, reasonable accommodations will be made to all each student to meet course requirements, but no fundamental or substantial alteration of academic standards will be made. Students needing assistance should contact Disability Support Services (256-765-4214).

Instruction for Accessing Reading Quizzes and Homework Assignments

Internet homework assignments and reading quizzes are handled at the website: <http://www.WebAssign.net> . In order to access these assignments, **a student eventually must purchase a WebAssign access code. Without an**

access code, you can still access your assignments during a limited grace period of a few days. The access code may have come bundled with your new textbook or it can be purchased via credit card directly from the WebAssign website.

To log into the WebAssign website, each student has a username and password. A student's username is the same as her UNAPORTAL username, initially, a student's password is the same as her username... **it is the student's responsibility to change this password once she has logged onto the website.** A student's username is the same as her UNAPORTAL username. If you do not know your username, and cannot figure out what it is, come see me as soon as possible to learn what username has been assigned to you.

Once you know your UNAPORTAL username, you can log in at the WebAssign website. To do this, you can go to the website and locate on the right side of the screen the three slots to enter login information. For example, if you were Jennifer Anne Does, your UNAPORTAL login might be jadoe3. In that case, you would enter the following information in the slots:

Username: jadoe3

Institution: una

Password: jadoe3

After entering this information, click on the "Log In" button to access your personal assignments page. At this point, you will be asked to enter an access code, or alternatively, you will be given the option to purchase an access code.

Without an access code, you can still access your assignments during a limited grace period of a few days.

When you have logged in, after entering the access code or not, you should see your personal WebAssign page. On this page, you should see a list of clickable links under the heading "My Assignments." The links with titles of the form **"RQ1 sections 23.1-7, 24.1-4"** and **"RQ 2 sections 25.1-8 26.1-2,4"** are the **READING QUIZZES**. The links with titles of the form **"HW 0"** and **"HW 1"** are the **HOMEWORK ASSIGNMENTS**. Links titled "RQ tutorial" and "HW tutorial" also appear. The tutorial links are designed to teach you how to enter answers to reading quiz and homework questions, and they count no points toward your course grade. Even though they count no points, you should complete these tutorials as soon as possible in order to become familiar with answering questions on this website. These tutorials will not be accessible by Thursday, August 27. Further information about reading quizzes and homework assignment sis discussed in the sections below.

Grading Information

Laboratory

Ten percent of a student's course grade comes from completing laboratory exercises. There are ten laboratory exercises and so each lab provides one-tenth of the total laboratory contribution. Note that a missed lab exercise cannot be made up.

Laboratory exercises are performed each Monday evening. There are two lab sections, one beginning at 4 pm and the other beginning at 6 pm.

Quizzes and Homework

Twenty percent of a student's course grade comes from completing internet-based Reading Quizzes, manually written Take-home Quizzes, and internet-based Homework Assignments. Each of the ten reading quizzes counts 2

points, each of the ten take-home quizzes counts 6 points, and each of the twenty homework assignments counts 6 points. Quiz and homework contribution to a student's course grade is determined from the 200 total points available.

Internet-Based Reading Quizzes

Once the student accesses her personal homework page on *WebAssign*, she should find a list of internet assignment. On this list, reading quizzes appear as links with titles of the form "RQ 1 sections 23.1-7, 24.1-4" the "RQ X" gives the order number of the reading quiz. The numbers following "sections" shows quiz sections in the textbook are covered by the quiz. In the example given, students should read sections 1 through 7 in chapter 23 and sections 1 through 4 in chapter 24.

These reading quizzes are used by me to monitor how closely you are studying the textbook. They are not example questions for students to learn from. However, students are free to ask about particular questions during lecture. Key features of reading quizzes:

- **You have only one opportunity to take each reading quiz, and each is a timed quiz. Clicking on a reading quiz link will begin the times quiz immediately, and you then have 30 minutes to complete the quiz.**
- **You can only submit one answer to each question in a reading quiz. To do so, after choosing a radio button corresponding to your answer, click on the "submit new answer" button.**
- Answers to questions in a reading quiz cannot be submitted after its due date and time. Due dates for the reading quizzes are shown in assignment schedules posted at regular intervals on the *angellearning* website. Due time for reading quizzes is 10 am on the date it is due.
- Some quiz questions refer to particular examples in the textbook, so it is a good idea to keep scratch paper, calculator, and the textbook nearby.
- A student can find out her total score on a reading quiz after its due date. The student cannot find out which questions in the quiz were marked incorrect, or what the correct answers to the questions are.

Take-home Quizzes

Take-home quizzes are designed to prepare students for the exam, and to monitor a student's progress in learning from her internet-based homework assignment. The first take-home quiz is handed out as a sheet of paper attached to this syllabus on the first day of class. Subsequent take-home quizzes will be handed out after completion of each exam.

Key features of take-home quizzes:

- **A student works out answers to take-home quiz questions on paper, and submits the paper for grading.**
- Students hand in the paper (stapled or paper clipped together) at the beginning of the lecture on the day it is due. Due dates for the take-home quizzes are shown in assignment schedules posted at regular intervals on the UNAPORTAL website. The quizzes are turned in during lecture on the date it is due.
- Solutions to a take-home quiz will be posted outside my office on the day that it was due.
- The graded take-home quiz will be returned the next lecture.

Homework Assignments

Once the student accesses her personal internet homework page, she should find a list of internet assignments. Homework assignments in this list appear as links with titles of the form “HW 0” or “HW 1”.

Unlike the reading quizzes, students are meant to use the homework assignments to learn how to solve problems. Key features of homework assignments:

- **Clicking on a homework assignment will begin that assignment. A student may submit answers to questions in a homework assignment as often as needed until the assignment’s due date. When a student submits an answer to a question, she finds out immediately whether her answer is correct. Once an answer to a question is marked correct, the student should not submit a new answer to that question.**
- Points are deducted from the homework assignment from those problems in which the correct answer was not submitted before the due date.
- Answers to questions in an internet homework assignment cannot be submitted after its due date and time. Due dates for homework assignments are shown in assignment schedules posted at regular intervals on the *angellearning* website. The due time of all homework assignments is 4 pm on the date it is due.
- Once a homework assignment’s due date expires, a student can still view the assignment but can no longer enter answers to assignment. A student can also view her final score on the assignment. Also, after the due date, the correct answers for each question will be displayed on the assignment.

In-Class Exams

Sixty percent of a student’s course grade comes from in-class exams. Ten exams will be given, and each will be scored on a 60 point scale. Thus, the exam contribution to a student’s course grade is determined from the 600 total points available.

Key features of exams:

- Exam dates are shown in assignment schedules posted at regular intervals on the *angellearning* website.
- Students will have the lecture hour to complete each exam.
- A student may bring with her to the exam: Pens or pencils, a calculator, and one sheet of paper with anything she wants written upon it. Cell phones must be turned off and put away during exam times. After completing the exam, the student will turn in her sheet of paper along with the exam.
- About half the problems on each exam require a quantitative (numerical) solution and a student should show work done to solve the problem. About half the problems require a student should show work done to solve the problem. About half the problems require a qualitative solution, and the student should provide a clear explanation of her solution.
- Solutions to an exam will be discussed briefly next lecture. At that time, students learn how they scored on the exam. A student cannot keep her exams, so she should write down her score for her own record-keeping.

Mid-term Exam

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A mid-term exam will be held on Wednesday, October 21. The mid-term exam is composed of 30 multiple-choice questions providing comprehensive coverage of the topics covered in previous exams. A student may only bring with her a pencil to fill out a scantron sheet. No calculators or study sheets are allowed. Only exam scores will be released; we will not discuss exam solution in lecture.

The exam score is determined by the sum of correct answers. The exam score is added as bonus points to the student's final course score. This is the only opportunity to collect bonus points.

Final Exam

A two-hour final exam will be held on Monday, December 14th at 8 am. The final exam is composed of 30 multiple choice questions covering all topics except harmonic oscillation and wave motion. A student may only bring with her a pencil to fill out a scantron sheet, a calculator, and a blank sheet of paper. The blank sheet of paper must be turned in with the exam. Only exam scores will be released; we will not discuss exam solution in lecture.

The exam score is determined by the sum of correct answers, scaled to 100 points.