

# Introductory Physics II

PHY 142.001/002 --- Spring 2015 Syllabus  
Physics Department --- Mercer University

**Textbook:** College Physics, by Openstax College

**Instructor:** Dr. Jose L. Balduz Jr.

**email:** [balduz\\_jl@mercer.edu](mailto:balduz_jl@mercer.edu), **office:** SEB 205, **phone:** 478-301-2229

**office hours:** TBA, or by appointment (try email)...

**Class Lecture Meetings:** MWF 1:00-1:50pm in EGC 210

**Lab instructor:** Mr. Glenn Harman, **email:** [harman\\_gh@mercer.edu](mailto:harman_gh@mercer.edu),

**142.001 Lab Meetings:** T 6-8:40pm in SEB 214

**142.002 Lab Meetings:** M 6-8:40pm in SEB 214

**Course web page:** <http://physics.mercer.edu/Balduz/IntroPhys/phy142home.htm>

Please also see Physics Department home page at <http://physics.mercer.edu>.

This course is the second in the two-semester sequence **PHY 141/142 Introductory Physics I/II**, an algebra-based introduction to physics. Therefore students must have prior academic credit for **PHY 141** or its equivalent. The course contains both lecture and lab components that will help students learn to think scientifically about the physical world. We will consider a series of topics: **Oscillations, Waves and Sound, Electric Charges/Fields/Potentials, Capacitance, Current and Resistance, DC Circuits, Magnetism, Light and Optics**. This course is intended primarily for biology majors and pre-health students (e.g., pre-medical, pre-veterinary), but is also recommended for any student in the College of Liberal Arts seeking to broaden their scientific background. Students must already have a working knowledge of geometry, algebra and trigonometry, as indicated by prior academic credit for **MAT 133 Precalculus** or its equivalent.

Nature behaves in predictable ways which scientists, over hundreds of years, have formulated into a set of basic physical laws. In the lecture portion of this course, students will learn some of these laws and use them to analyze systems mathematically, reach qualitative conclusions, and compute accurately numerical answers to specific questions. Although we will cover a number of topics and physical systems, an important goal is for students to learn to think about nature broadly, and solve problems by specific application of general principles, as physicists do.

The ultimate validity of these natural laws always rests on experimental evidence. In the lab portion of this course we will illustrate, by experiment, a portion of those laws describing the behavior of simple mechanical, optical, and electromagnetic systems. In the process, students will gain basic concepts and procedures of physics laboratory work. They will become familiar with simple experimental apparatus and construct simple devices; measure quantities such as length, frequency, current, voltage, capacitance; compute derived quantities from the data, and perform basic statistical analysis of the data and the derived quantities; and reason from this analysis to answer questions and arrive at logically sound conclusions about the physical world. This process will help them to master the concepts introduced in the lectures, by showing them in action in the laboratory setting. Although we will investigate a number of specific physical systems, students' goal should be to learn to think about nature and perform experiments as physicists do.

**WebAssign and the eBook:** Each student in the course must obtain an online account with WebAssign that will cost ~\$33 and will provide access to the online problems and homework assignments, as well as an eBook version of the text. Relevant links will be provided on the course webpage. A regular hardcover textbook is also available at the campus bookstore and elsewhere.

**Course web page:** During lecture class meetings the instructor will use both a projector and a blackboard or whiteboard. Most material presented on the projector in class will be available on the course homepage: basic conceptual material, examples and solutions to textbook problems. Exam and quiz solutions will also be posted after these are graded. In addition, other materials which cannot be presented in class due to time constraints may also be posted on the web page.

**Lectures:** During scheduled "lecture" class periods we will have reading quizzes, lectures on the reading assignments, group work, quizzes and exams. During lectures, the instructor will give a conceptual and theoretical overview of the course material, present examples, go over solutions to textbook problems, answer questions and ask questions to stimulate thinking and discussion. We will often access and use an online version of the text.

**Lab sessions:** Each student will be a member of a lab group. Students may form groups as they wish for each lab exercise. All data collection will be performed by the group. After that, each group must work to complete all data analysis, i.e. data tables and required graphs, before leaving the lab. Often, students will have enough time to complete the entire lab procedure and the analysis during one session. Other times, there will not be enough time during the session, and it will be necessary to finish the analysis later. During each lab session, each student is obligated to a) attend the entire session, b) work successfully with the group to collect the data, and c) help the group carry out the required analysis during the session. Typically, students will not be able to leave the lab session early: Any student who arrives late, fails to contribute to the group work, acts in a disruptive manner, or leaves early without instructor permission will suffer a penalty to their grade for that lab.

**Reading assignments / Reading quizzes (5% of total grade):** Before discussing a topic in class, it is vital that each student be at least somewhat familiar with the content. To this end, students will receive a series of reading assignments, to be completed before a specific day of class. Before we begin to cover the relevant material in class, we will have an individual reading quiz. This will be brief, and will consist of a few conceptual questions, rather than numerical calculations. The reading quizzes will be *open-book*: i.e., students are allowed use of a textbook, and whatever paper notes they want to bring. No laptops or other mobile devices may be used.

**Classwork (10% of total grade):** After a topic has been introduced via the reading assignment, reading quiz, and lecture, students will be given a set of problems to solve together in groups. Students may form these groups as they wish, and they may vary from day to day; however, the instructor reserves the right to change or pick the groups if he deems it appropriate. Classwork will be *open-book*.

**Quizzes (one for each reading assignment, for 10% of the total grade):** After students have a chance to solve problems in groups, we will conclude treatment of a topic by having an individual quiz. These may include both qualitative and quantitative questions. Quizzes will be *open-book*.

**Homework (one per chapter, for 10% of total grade):** Each student will use WebAssign to complete homework assignments for each chapter. Students may work individually or in groups, and they may use the textbook or any other resources except for the Instructor's Solutions Manual, which is considered off-limits. Although you are encouraged to work together, each student must submit their own answers, by the due date, electronically in their own account to receive credit.

**Lab work (15% of total grade):**

**Lab reports:** For most labs, students must submit reports containing data tables, graphs, conclusions, and answers to additional questions: For details please see "*Lab Report Guidelines*." In most cases, reports will be prepared after the lab session and will be due on the day of the next lab session. The students in each group must either submit individual reports or a group report as they

wish. For any report, each student who helped to prepare it must sign it, and everybody who signs it will receive the same grade. Depending on the amount of work involved, each report will be worth a variable number of points ranging from 50 to 100. In cases where all report elements are required, the number of points will be close to 100: data tables and graphs will account for about 20% of the grade, with the introduction, answers to questions and conclusions accounting for the remaining 80%. In cases where there are no questions to be answered and/or no formal conclusions to be drawn, the number of points will be reduced. In some cases students will hand in their work at the end of the lab session; these short reports will also be worth close to 50 points.

**Pre-exam practice problem sessions:** During the lab session before each exam (A, B, C), students will do classwork in groups, instead of a lab exercise. This will consist of textbook and exam-like problems, and is intended to help prepare them for the upcoming exam, especially as it reveals areas that still need work. Like the exams, practice problem sessions will be *closed-book*.

**Exams (three, for 30% of the total grade):** The three exams (A, B, C) will consist entirely of numerical problems. Exams will be *closed-book*: no textbooks or notes will be allowed, nor laptops or other mobile devices, but the instructor will supply a formula sheet. The topics and *tentative* dates for the exams are as follows:

- Exam A (F 2/13): Oscillations and Waves [Ch. 16-17],
- Exam B (F 3/6): Electric Fields and Potentials [Ch. 18-19],
- Exam C (M 4/6): Electric Currents and DC Circuits [Ch. 20-21],

**Final Exam (Friday, May 8, 9am-noon, for 20% of the total grade):** The final exam will be comprehensive, composed entirely of qualitative and quantitative multiple choice questions. The final exam will also be a *closed-book* test.

**GRADING SCALE:** How much weight is given to each activity, in percentages of the total grade, is shown in the left table below. The final letter grade will be determined from the total grade using the scale shown in the right table below.

	#	% each	total %
Reading quizzes	var	var	5
Classwork	var	var	10
Quizzes	var	var	10
Homework	~10	~1	10
Lab work	~15	~1	15
Exams (A, B, C)	3	~12	30
Final exam	1	15	20
<b>Total</b>			<b>100</b>

	GP	%
<b>A</b>	4.0	90-100+
<b>B+</b>	3.5	85-89
<b>B</b>	3.0	80-84
<b>C+</b>	2.5	75-79
<b>C</b>	2.0	70-74
<b>D</b>	1.0	60-69
<b>F</b>	0.0	0-59

## ADDITIONAL NOTES

**Syllabus changes:** The dates for exams A, B and C are tentative and subject to revision. If other changes to this syllabus are necessary, they will be implemented after discussion and negotiation with the students.

**Missed labs, quizzes and exams:** To avoid hurting their grade, when a student misses any in-class activity (quizzes, classwork, exams, labs) they must convince the instructor that their absence was unavoidable or served a very good cause (e.g. when a student represents Mercer as part of a team).

If their absence is not excused they will receive no credit for that activity. It is best to speak to the instructor ahead of time, or to present an official excuse from a Dean or team faculty advisor, or a doctor's excuse.

- There are no make-ups. If a class absence is excused by the instructor, the student's grade will be pro-rated for the activities on that day - i.e. their final grade will not suffer. Anybody who did not take part in a lab session should not sign a report for that lab: They cannot receive any credit for that lab.
- Missed exams which are excused by the instructor may be made up. However, if no alternate arrangements were made *beforehand*, this will be allowed only if the student has an official excuse: e.g., a note from a Dean's office, or a detailed doctor's note.

**Lab safety:** Lab equipment may be hazardous to your health. Always follow the instructions of your lab instructor or their lab assistant, and consider the well-being of your classmates as well as yourself... Think Safety First!

**Lab manuals:** The lab manuals (instruction sets and data tables) are viewable on computers in SEB 214 during lab sessions, and copies of relevant instructions will be handed out to each lab group. Students may print completed data tables, graphs and lab reports during the lab sessions; please do not print additional copies of the lab instructions.

**Dropped grades:** There will be no dropped grades. All work done in the course will be counted.

**Extra credit:** There will be no extra-credit work, except what is associated with the assessment post-test.

**Honor Code:** The College of Liberal Arts' academic misconduct policy will be followed. All students are bound by the Mercer University Honor Code... In addition, for all graded work completed in this class (except the online homework), each student must write their name on the paper, and they must sign the paper themselves; otherwise they will receive no credit. It is unethical, and a violation of the honor code of this university, for any student to submit work in person or online for credit, knowing that some person who may get credit did not contribute significantly to that piece of work. This applies not only to homework sets but also to quizzes, classwork, exams, term papers, lab reports and any other work you do at this or any other school...

**Electronic devices:** In order to maximize student engagement and to minimize sources of distraction, neither laptop computers nor cell phones may be used when class is in session. Likewise, no student should communicate electronically with any person inside or outside the classroom by any means while class is in session. During quizzes, classwork, and exams, no electronic devices of any kind may be used except for a calculator; the only exception being possible use of computers to access WebAssign during classwork in the lab room. Any violation of these rules may result in the offending student being asked to leave the classroom. **Exception:** *Laptop use may be allowed*, for note-taking and access to the course web page and the eBook, if this is not disruptive to other students, and if the laptop user pays attention to and remains engaged in the class. If this is not the case, or if any other use of the laptop is made, the instructor will ask the student to close the laptop, on a permanent basis. Nevertheless, it is strongly advised, that students take notes by hand and bring a paper textbook to class.

**Office hours:** Students are *strongly encouraged* to discuss with the instructors all their work during the course, *regardless of their grades*. Office hours are the best vehicle for this discussion. They also afford any student the chance to get personalized help from the instructor, so please don't be shy...

**Disability support:** Students requiring accommodations for a disability should inform the instructor at the close of the first class meeting or as soon as possible. The instructor will refer you to the Disability Support Services Coordinator to document your disability, determine eligibility for accommodations under the ADA/AA/Section 504 and to request a Faculty Accommodation Form. Disability accommodations or status will not be indicated on academic transcripts. In order to receive accommodations in a class, students with sensory, learning, psychological, physical or medical disabilities must provide their instructor with a Faculty Accommodation Form to sign. Students must return the signed form to the Disability Services Coordinator. A new form must be requested each semester. Students with a history of a disability, perceived as having a disability, or with a current disability, who do not wish to use academic accommodations are also strongly encouraged to register with the Disability Services Coordinator and request a Faculty Accommodation Form each semester. For further information, please contact Carole Burrowbridge, Disability Services Coordinator, at 301-2778 or visit the Disability Support Services website at <http://www.mercer.edu/studentaffairs/disabilityservices>

All requests for reasonable accommodation are welcome also in regard to absence from class for school representation (i.e., athletic or other events) or personal/family problems.