Physics 212: Physics for Science and Engineering II
Section 1, Spring 2024

Instructor: Dr. Jake Bennett
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Office: Lewis 105
Office Hours: M 10:00-11:30 am, W 1:00-2:30 pm
and by appointment

TA: TBA

Class Location: Lewis 101
Class Time: TTh 9:30-10:45 am

Discussion session: TH 5:30 - 6:50 pm

Discussion Location: Brevard 134

Course Description

This is a three credit-hour, calculus-based physics course which covers electricity and magnetism, modern physics, and physical optics. This course deals with electric and magnetic interactions, which are central to the structure of matter, to chemical and biological phenomena, and to the design and operation of most modern technology.

Course Objectives

On completion of this course, students should be able to do the following:

- Apply a small set of fundamental physical principles to a wide variety of physical situations.
- Use these principles to explain a wide variety of physical phenomena.
- Use these principles to predict the behavior of a variety of physical systems.

Teaching Philosophy and Approach

Qualitative reasoning and quantitative evaluation are emphasized in this course. This is done through an active learning approach; problem-solving in physics using interactive instruction, collaborative learning and computer applications. Students will perform hands-on tasks and solve practice problems in class. Students are expected to prepare for class by completing the assigned reading in order to introduce themselves to the basic material and start working with it before class. Otherwise it will be very difficult to contribute to the collaborative in-class activities and problems, which are graded.

As class meetings will often include activities and experiments, students should be aware that note taking may be different than in other lecture classes. Students are encouraged to bring a notebook to each class and record observations and inferences during activities and demonstrations, not just the details the instructor writes on the board. It is also highly recommended to take notes while reading the textbook and otherwise preparing for class.

Required Text

University Physics Volumes 2 and 3, by OpenStax.
https://openstax.org/details/books/university-physics-volume-2
https://openstax.org/details/books/university-physics-volume-3

This is an open source textbook from OpenStax. It is available for free online in a variety of formats, including html, pdf, Apple iBooks, and Amazon Kindle. If you prefer, you can also purchase a print version via OpenStax on Amazon.com. If you do choose to buy from Amazon, be sure to use the link on the textbook page at openstax.org to ensure that you get the official OpenStax print version.

Other Required Items

- *Online homework and classroom activity system, Webassign*: Students must purchase access to Webassign, which can be accessed through Blackboard (blackboard.olemiss.edu).
- *Classroom response system, Top Hat*: Students must purchase access to Top Hat.
- *Scientific calculator*: Any calculator with trigonometric functions, exponential functions and scientific notation is acceptable. Online calculators are allowed, but may not be used for quizzes and exams.

Expectations

Pre-class assignments: **Students should expect to spend about 8 hours per week reading, doing homework, and otherwise preparing for class**. Studying the textbook regularly and not waiting until just before homework is due or a test is imminent will be of great benefit. Much of the material builds on itself, so having a good understanding of earlier material will make the new material more approachable. When reading the assigned textbook sections, complete the "Check your understanding" problems interspersed in the text, identify concepts or reasoning that was not clear to you and complete the Reading Guides. Answer all questions on the Reading Guide and take note of any material that is not clear to you. Take note of clicker questions and in-class problems that are not clear and bring them to office hours or the help session.

Attendance and in class participation Students are expected to attend all classes and participate in all in-class activities. Students who miss class are still expected to understand the material that is covered and complete the in-class assignments, which will be available on WebAssign. Class attendance will be verified for university purposes during the first two weeks of class.

Course Prerequisite and Corequisites

- Prerequisite: Physics 211
- Corequisites: Physics 222 and Math 262

Assessments

- Formative Quizzes (10%) Formative quizzes will be given weekly. These quizzes are intended primarily to show students where their understanding is weakest and help to focus their study efforts. All quizzes are closed book (no books, notes, or "cheat-sheets"), individual assignments. Calculators are allowed and a formula sheet will be provided. Formative quizzes will likely be given during the first 10-20 minutes of class every Thursday.
- Summative Quizzes (25%) More detailed, summative quizzes will be given approximately every four weeks to gauge students' level of understanding of the material. The summative quizzes will be longer than formative quizzes and will cover all material discussed since the last summative quiz. All quizzes are closed book (no books, notes or "cheat-sheets"), individual assignments. Calculators are allowed and a formula sheet will be provided. Summative quizzes will likely be given during the help session time on Thursdays.
- Homework (25%) Homework sets will be assigned using the WebAssign online homework system that can be accessed through Blackboard. Written homework may also be assigned occasionally. It is very important to start early and finish homework on time. A penalty is applied for too many submissions for a problem. To avoid this penalty, students should work each problem carefully on paper before submitting solutions. This will also be very helpful when studying for tests.
  - As scientists and engineers normally work in groups, students are encouraged to work together on homework to teach and learn from each other. However, each student is responsible for understanding all details of a problem solution.
  - Homework help sites such as Chegg are a liability, not a resource. Depending on sites like these is a sure way to do poorly on a quiz or exam. Instead, work with group members, the TA, or the instructor. Teaching peers is a great way to solidify your understanding!
  - Students may be required to turn in written homework solutions or video descriptions for grading. Students should use a good problem-solving strategy, such as the GOAL strategy outlined in additional handouts.
  - There is no penalty for extensions past the due date during the first two weeks of class. **After the first two weeks, there will be a 20% penalty per extension beyond the last homework for the chapter. Extensions will be for two days past the due date.**
- Pre-class assignments (10%) Pre-class assignments include textbook readings and short example problems. Reading guides will be provided as an aid to get the most out of the reading. A 50% penalty will be assessed for late submissions.
- Participation (10%) Students are expected to attend all classes. The attendance grade will be derived from clicker questions, in-class activities, and exit tickets. **Every four unexcused absences will result in a drop of one letter grade for the course, according to the grading scale below.**
- Final exam (20%) The final exam is comprehensive and will include multiple question formats, including true-or-false, multiple choice, fill-in-the-blank, and free-response. **The final exam date is Thursday, May 9, at 8:00 am.**

Grading Scale

- $92\% \leq$ A $\leq 100\%$
- $88\% \leq$ A- $< 92\%$
- $84\% \leq$ B+ $< 88\%$
- $80\% \leq$ B $< 84\%$
- $76\% \leq$ B- $< 80\%$
- $72\% \leq$ C+ $< 76\%$
- $68\% \leq$ C $< 72\%$
- $64\% \leq$ C- $< 68\%$
- $60\% \leq$ D $< 64\%$
- F $< 60\%$

Policies

Academic Integrity

Every student of the University of Mississippi, by virtue of choosing to be part of the university community agrees to abide by the University of Mississippi Creed and the UM Academic Integrity Policy which covers academic integrity. Please consult the M-Book, Academic Integrity document for details on university policy and the academic creed.

Cheating is forbidden and will result in a zero grade on the assignment. A second case of cheating will result in an F for the entire course.

All materials distributed electronically and in hard copy in this class are protected under intellectual copyright. Any attempt to upload these documents onto the Internet (or to distribute them by some other means) or to profit from the distribution (by Internet or other means) of these documents constitutes theft and will be in violation of intellectual property law and the UM Academic Conduct Code unless expressly permitted for by the instructor. Accessing such materials for your own use is also in violation of the UM Academic Conduct Code.

Disability Access and Inclusion:

The University of Mississippi is committed to the creation of inclusive learning environments for all students. If there are aspects of the instruction or design of this course that result in barriers to your full inclusion and participation, or to accurate assessment of your achievement, please contact the course instructor as soon as possible. Barriers may include, but are not necessarily limited to, timed exams and in-class assignments, difficulty with the acquisition of lecture content, inaccessible web content, and the use of non-captioned or non-transcribed video and audio files. If you are registered with SDS, you must log in to your Rebel Access portal at https://sds.olemiss.edu/rebel-access-portal to request approved accommodations. If you are NOT registered with SDS, you must complete the process to become registered. To begin that process, please visit our website at https://sds.olemiss.edu/apply-for-services. SDS will: (1) Complete a comprehensive review to determine your eligibility for accommodations, (2) If approved, disseminate to your instructors a Faculty Notification Letter, (3) Facilitate the removal of barriers, and (4) Ensure you have equal access to the same opportunities for success that are available to all students. If you have questions, contact SDS at 662-915-7128 or sds@olemiss.edu.

Audio and video recording

Audio and/or video recording of class lectures is not allowed unless explicit permission is given by the instructor. Permission will only be given if the student has a Student Disability Services request. In such cases, recordings may only be used by the student to whom permission is given and all recordings must be deleted at the end of the semester. Recordings may not be distributed online or elsewhere.

Important Dates

See the academic calendar (**https://registrar.olemiss.edu/spring-2024**)

Tentative quiz/exam dates

- Summative Quiz 1: Thursday, February 22nd, 5:30 - 7:00 pm
- Summative Quiz 2: Thursday, March 28th, 5:30 - 7:00 pm
- Summative Quiz 3: Thursday, April 25th, 5:30 - 7:00 pm
- **Final Exam: Thursday, May 9, at 8:00 am.**