Physics 212: Physics for Science and Engineering II
Section 5, Spring 2022

Instructor: Dr. Jake Bennett
(jvbennet@olemiss.edu)
Web: **https://physics.olemiss.edu/bennett/**

Office: Lewis 105
Office Hours: M,F 9:00-10:00 am
and by appointment

TA: Amitesh Singh
(asingh10@go.olemiss.edu)

Class Location: Brevard 238
Class Time: MWF 8:00-8:50 am

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

Discussion Location: Bishop 112

Course Description

A calculus-based introduction to electricity, magnetism, electromagnetic waves, and related topics, including geometrical and physical optics. Second part of a two-semester survey of classical physics. The honors section of this course will be structured as an active learning environment, in which students spend a significant amount of class time performing experiments or working in small groups. Students in the honors section will also explore the historical context of significant breakthroughs in electromagnetism and their influence on technological and scientific advances.

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 in a Student-Centered Active Learning Environment with Upside-down Pedagogies (**SCALE-UP**). In this approach, students spend most of the class time doing hands-on activities and solving interesting questions and problems, complemented by focused lectures by the instructor. Students are expected to prepare for class by completing an assigned reading in order to introduce themselves to the basic material and make collaborative in-class activities more effective.

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 at Rice University. 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.

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.

Group work Students will be assigned to a group. In-class activities are to be performed collaboratively by the group. Members of the group must agree to a group contract that details the responsibilities of the members. If anyone is unsatisfied with the way the group is working, they should first discuss it with group members. If the issue cannot be resolved within the group, discuss it with your instructor. Groups will change after each test. **If a group has an average of >80% on a summative quiz, each group member will receive a 5% bonus.**

A few words of advice: Note taking in this class will be very different than in a lecture style class. Get a notebook to use for the course (homework, in-class problems, etc) and take notes in the margins about your approach to the problems. Make notes about clicker questions and in-class assignments. This will be very helpful for later review.

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 topics. 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 Friday.
- 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 discussion session on Thursdays.
- Homework (15%) 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. There is a 25% penalty for each submission beyond 3. 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. This will be done through Blackboard. 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. 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. Simple questions will be included in the reading guides, which will be graded. A 50% penalty will be assessed for late submissions.
- In-class activities (15%) In-class activities will include whiteboard activities and group problem solving work. If insufficient time is available to complete an in-class activity, it will be extended, as announced by the instructor.
- Participation (5%) Students are expected to attend all classes. The attendance grade will be derived from clicker questions and exit tickets posed during class. **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 Friday, December 10, at noon.**

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- $< 68\%$
- $50\% \leq$ D $< 64\%$
- F $< 50\%$

Policies

Attendance Policy

Honors courses are small classes, usually taught in seminar style with no more than fifteen students. They are reading, writing and discussion intensive. Student participation is therefore essential. In addition, the university commits extensive resources, especially in terms of faculty time, to these small classes. For these reasons, the Honors College has an attendance policy for all honors courses, both required and departmental. Students are entitled to two absences in Tuesday/Thursday classes and to three absences in Monday/Wednesday/Friday classes. Consequences of additional absences will be determined by the individual faculty member.

The Honor Code

The Sally McDonnell Barksdale Honors College employs an Honor Code centered on honesty, sincerity, and justice. The purpose of this Honor Code is to strengthen the sense of community in which the Honors College takes great pride. Its strength depends on the personal honor and integrity of each Honors College member. Honors students are required to write the following statement on any assignment submitted for grading in Honors classes, thereby reinforcing the atmosphere of trust within the Honors College community:

"On my honor, I pledge that I have neither given, received, nor witnessed any unauthorized help on this _____"

Signature: _____

In addition to this pledge, the Honors College has instituted the following policy that is in effect in all honors classes: In addition to this pledge, the Honors Council created a five-member Academic Integrity Committee in August 2012 to assess all formal Academic Discipline cases against SMB Honors students. The Honors Council appoints two faculty members who have taught Honors courses, the SMBHC Student Senate appoints two Honors students in good standing, and the Dean appoints an Associate Dean to the committee. This Committee, chaired by the SMBHC Associate Dean, will examine the evidence available in the Academic Case and make a recommendation to the Dean for any action concerning the good standing of the student in question. Recommendations can include (1) No Action, if the offense appears to be minor; (2) Probation, possibly for a first offense; or (3) Dismissal from the Honors College, usually for a second offense or for an offense of a serious nature.

The University Creed

All students should uphold the University Creed and the regulations in the Universitys M-Book.

Student Support Resources

Students are encouraged to visit the University's Keep Learning site (https://olemiss.edu/keeplearning/) to access information and resources related to COVID-19 support. The site provides links to University student services to facilitate and support learning.

Students with diagnosed health concerns that may affect their compliance with COVID-19 health requirements should contact UM's Student Disability Services (SDS) Office (https://sds.olemiss.edu) to see if they are eligible for an SDS accommodation as soon as possible.

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 (**http://registrar.olemiss.edu/fall-2021**)

Tentative quiz/exam dates

- Summative Quiz 1: Thursday, February 17th, 5:30 - 7:00 pm
- Summative Quiz 2: Thursday, March 24th, 5:30 - 7:00 pm
- Summative Quiz 3: Thursday, April 21th, 5:30 - 7:00 pm
- **Final Exam: Monday, May 2, at 8:00 am.**