

Physics 303: Physical Theory and Techniques, Fall 2021

Instructor: Dr. Jake Bennett
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Web: <https://physics.olemiss.edu/bennett/>

Class Location: Lewis 109

Office: Lewis 105
Office Hours: W 1:00-2:00 pm, Th 9:30-11:30 am
and by appointment

Class Time: TTh 08:00-9:15 am

Course Description

This course covers fundamental physical models widely applicable to the undergraduate physics curriculum. Emphasis is placed on the development of problem-solving skills using calculus, advanced algebraic concepts, estimation techniques, and computer modeling.

Course Prerequisites

- Math 262
- Physics 212 or 214

Learning Objectives

This course is intended to act as a bridge between the introductory physics sequence (Phys 211/212 or Phys 213/214) and the more formally demanding courses at the 300 and 400 level, which are required for a BS degree in Physics. This course is also meant to be of value to students in adjacent fields who would benefit from exposure to the analytical and computational tools commonly used by physicists.

Required Text

University Physics Volumes 1 and 2, by OpenStax.

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

- *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.

Grading Scale

- $92\% \leq A \leq 100\%$
- $88\% \leq A- < 92\%$
- $84\% \leq B+ < 88\%$
- $80\% \leq B < 84\%$
- $76\% \leq B- < 80\%$
- $72\% \leq C+ < 76\%$
- $68\% \leq C < 72\%$
- $64\% \leq C- < 68\%$
- $50\% \leq D < 64\%$
- $F < 50\%$

Assessments

- Homework (30%) Homework sets will be assigned weekly. It is very important to start early and finish homework on time.
 - 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 are 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 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.**
- In-class activities (20%) 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. Students are expected to attend all classes. **Every three unexcused absences will result in a drop of one letter grade for the course, according to the grading scale below.**
- Quizzes (20%) Short quizzes will be given approximately every other week. 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.
- Final exam (30%) The comprehensive final exam will be held on **Tuesday, December 7, at 8:00 am.**

Important Dates

See the academic calendar (<http://registrar.olemiss.edu/fall-2021>)

Policies

The University Creed

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

Student Support Resources

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.