

PHYS 212 Syllabus Spring 2021, Jan. 17, 2021 Edition*

Prof. Zachariah Etienne

Class meets MWF 9:30AM–10:20AM in White Hall G06

Contact Information

- Instructor: Prof. Etienne, zbetienne *[at](mailto:zbetienne@mix.wvu.edu)* mix.wvu.edu
- Grader: Joseph Benigno, jab00042 *[at](mailto:jab00042@mix.wvu.edu)* mix.wvu.edu

Instructor Office Hours

- Mondays 11:00AM–12:00PM or by appointment, over Zoom (<https://wvu.zoom.us/j/94461280420>).

Course Websites

- Homework assignments will be found on eCampus, and homework solutions must be uploaded to eCampus
- Syllabus will be posted both to my homepage (<http://astro.phys.wvu.edu/zetienne/>) and to eCampus.
- All other course web content may be found on eCampus.

Prerequisites

- C- or above in PHYS 111 and 112, which have prerequisites:
 - C- or above in Calculus 1 (MATH 155 or 153/154)
- *Unofficial corequisite*: Calculus 2 (MATH 156)

Course Objectives

- Investigate applications of wave phenomena in basic mechanical systems and electrical circuits. We will employ mathematical models of waves to explain a variety of physical phenomena.
 - Waves are ubiquitous in describing and understanding the physical world and are of fundamental importance.
- Introduce fundamental concepts concerning the thermal properties of matter, and apply the laws of thermodynamics to basic problems involving heat transfer.
 - A solid grounding in thermodynamics is also essential to describe many real-world applications that physicists encounter.
- Cement advanced mathematical techniques appearing in other upper-level physics courses.
- Help improve your self-studying skills that become increasingly necessary to master the physical sciences at the advanced undergraduate level.

Textbook

- “Sears & Zemansky’s University Physics, 14th Edition”, by Young & Freedman.

Attendance Policy

In order to fully succeed in this class, and get the most benefit from it, you are expected to attend all classes and participate in the discussions and activity. I will take on-time attendance each class, and in combination with your willingness to participate in class activities (taking notes and solving in-class exercises) and discussions, use this to determine your Class Participation grade throughout the semester. If a student refuses to participate they will not receive attendance points for that class.

The Class Participation grade will be given by the number of lectures attended plus 3 unexcused absences, divided by the total number of lectures given. The maximum Class Participation grade shall not exceed 100%.

*Note that this syllabus is subject to revision, at the option of the instructor. If revised, the new syllabus will not become official until the instructor has distributed it to students over email.

Special absences (e.g. medical emergencies, family crises etc) will be taken into consideration as needed. However any absences must be communicated to the instructor ahead of time. A simple email sent to me prior to or during class is an acceptable method of notification.

All homeworks and exams will be based on material covered in the course text and in-class exercises. Weekly homeworks will be distributed over eCampus. Arriving late to class is disruptive to the normal functioning of the course, and may result in **forfeiture of significant bonus point opportunities and Class Participation grade for that class.**

“Assume the PRT will be down!” On exam days, students should have no expectation that their normal mode of transportation will be functioning properly. Additional time will not be given for exams if a student arrives late.

COVID-19 Policy

We are in the midst of a national pandemic. If you feel at all ill, please stay home for the benefit of yourself and your classmates. If your symptom/symptoms is/are compatible with COVID-19, you must get tested immediately. You must wear an appropriate facial covering at all times while in class. To assist with contact tracing, there is assigned seating this semester. You are free to choose your seat at the start of the first class.

Please contact me over email if you cannot attend class due to feeling ill; I will send you the lecture notes for days in which you are absent, and make-up exams will be scheduled as necessary.

This is an in-person class, which will meet in person unless the instructor becomes ill or the University mandates virtual instruction. Further details will become available if virtual instruction becomes necessary.

The University’s complete COVID-19 policy may be found here: <https://www.wvu.edu/return-to-campus>.

Grading

Grading Scale

- A- to A+: 85—100%
- B- to B+: 70—84%
- C- to C+: 60—69%
- D- to D+: 50—59%
- F: Below 50%

Overall Course Grade

Overall course grades will be based on the total number of points earned by a student. The points will be divided as follows:

- Class Participation (See **Attendance Policy** above): 15%
- Homework Assignments (See **Homework Policy** below): 35%
- Midterm Exam (Monday, March 8): 20%
- Comprehensive Final Exam (Wednesday, May 5, 2:00PM–4:00PM): 30%

Mid-Check Grade

The Mid-Check (a.k.a. Mid-Semester) grade will be based on the total number of points earned by a student up to and including material one week prior to when Mid-Check grades are due. The Midterm Exam will always be included in this grade, and the points will be divided as follows:

- Class Participation (20%)
- Homework Assignments (30%)
- Midterm Exam (50%)

Homework Policy

1. Homework assignments will be due weekly, on Tuesday evenings, and must be uploaded to eCampus.
2. **Red Ink:** Red ink may not be used by the student in homework assignments, or a penalty of 15% will be assessed on the entire assignment.
3. **Vague or Unclear Answers:** Presentation and discussion of results is at least as important as the results themselves—often students doing great work *fail to achieve career goals* because they did not make adequate effort to clearly and unambiguously present the results of their work to others. Thus significant penalties will be assessed if a student’s answers are vague or unclear on homeworks or exams. Tip: *Whenever possible, use the vocabulary we developed in class!*
4. **Late Homework Policy**
 - Full solutions will be due at the start of class on the due date; handing in parts of the assignment at different times is forbidden. Students are strongly encouraged to start early, or confusions may prevent them from handing in homeworks on time, and *the standard homework late penalty will be imposed.*
 - Keeping up with course material is essential to success in this class, as a great deal of material is covered. Therefore, late assignments will be penalized as follows:

- 2–48 hours late: 20% score reduction
- 2–4 days (48–96 hours) late: 50% score reduction
- 4–7 days (96–168 hours) late: 80% score reduction

5. Electronic Submission of Homework Assignments

- All homework assignments must be completed by hand, scanned, and handed in *as a PDF file* to eCampus.
- You are strongly encouraged to use the free cellphone app Office Lens when submitting homework assignments, which is available on Google Play, Apple Store, and Microsoft Store.
- Tips for using Office Lens:
 - Select “Whiteboard” as the type of document to scan, as it increases the contrast and will reduce the file size.
 - Multipage PDFs: After you take a picture of the first page, in the lower left there is an “Add New” button that will allow you to record any number of additional pages. All the images will be compiled into the same PDF document.
 - After scanning all the pages, be sure to review your PDF file carefully before uploading to eCampus.
- **Electronic submissions that are not a single PDF file will not be accepted, and the standard late penalty will be imposed on late submissions, as outlined above. You are strongly encouraged to become comfortable with the scanning software and upload process prior to submission.**
- It is the student’s responsibility to review their PDF prior to submission, to ensure that the document was scanned properly and that all work is legible. Illegible work or corrupted PDF files will not receive credit.

6. Bonus Credit for Professional Presentation

- If all problems are handed in in order for a given homework assignment THREE “In-Order Bonus” points will be awarded toward that homework. (No Appendices allowed.)

Tentative Course Schedule

The following course schedule is subject to change. Numbers in parentheses denote the corresponding sections of the book.

- Week of 18-Jan-2021: MLK recess; Welcome to class (11.3); Hooke’s law (11.4-5);
- Week of 25-Jan-2021: Gases/Liquids (12.1-2) Buoyancy (12.3-4); Bernoulli (12.5-6)
- Week of 1-Feb-2021: SHM review (14.1-4); Pendula (14.5-6); Oscillations (14.7-8)
- Week of 8-Feb-2021: LC circuits (30.5); LRC circuits (30.6); A/C circuits (31.1-5)
- Week of 15-Feb-2021: Types of wave (15.1-3); Wave energy (15.4-5)
- Week of 22-Feb-2021: Wave interferences (15.6-7); Normal modes (15.8); Special functions
- Week of 1-Mar-2021: Sound waves (16.1-3); No-Instruction Day; Midterm Review
- Week of 8-Mar-2021: Midterm Exam; Standing waves (16.4-5); Worked examples;
- Week of 15-Mar-2021: Doppler effect (16.8); Shock waves (16.9)
- Week of 22-Mar-2021: Fourier series; Fourier transforms
- Week of 29-Mar-2021: Temperature (17.1-3); Thermal expansion (17.4); Spring Holiday
- Week of 5-Apr-2021: Heat (17.5-7); Molecules (18.5-6); Equations of state (18.1-2)
- Week of 12-Apr-2021: Ideal gases (18.3-4); Thermodynamics (19.1-4); Thermo processes (19.5-7)
- Week of 19-Apr-2021: Ideal gases (19.8); Heat engines (20.1-3); Refrigerators (20.4-5)
- Week of 26-Apr-2021: Carnot cycles (20.6-7); Entropy (20.7-8); Black hole radiation (*if time permits*); Final Exam Review
- Week of 3-May-2021: Wednesday, May 5, 2021: Comprehensive Final Exam from 2:00PM–4:00PM

Academic Dishonesty

The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, instructors will enforce rigorous standards of academic integrity in all aspects and assignments of their courses. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Standards Policy:

<http://catalog.wvu.edu/undergraduate/coursecreditstermsclassification/>

Should you have any questions about possibly improper research citations or references, or any other activity that may be interpreted as an attempt at academic dishonesty, please see your instructor before the assignment is due to discuss the matter.

Inclusivity Statement & Accommodations

The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion. If you are a person with a disability and anticipate needing

any type of accommodation in order to participate in your classes, please advise your instructors and make appropriate arrangements with the Office of Accessibility Services. (<https://accessibilityservices.wvu.edu/>)

More information is available at the Division of Diversity, Equity, and Inclusion (<https://diversity.wvu.edu/>) as well.

Students requesting special accommodations are required to inform the instructor at least 48 hours in advance of a test.

Electronic Device Policy

During lectures and exams, **cellular phones** and other electronic devices (including but not limited to tablet computers, laptops, PDAs, MP3 players, Blackberrys) are not permitted, except with the consent of the instructor. **Important exception: Scientific and 4-function calculators are permitted in lectures only.** All forbidden devices must be turned off before the beginning of the class period and placed out of sight (for example, in a backpack or handbag) until the class has concluded.

A student's first violation of this policy **during lectures** will result in a verbal warning (one verbal warning per semester), and each subsequent violation *even during the same lecture* will result in a 1% deduction in the student's overall course grade. Violations of this policy **during exams** will result in a zero grade on the exam and possible expulsion from the course.

Intellectual Property Notice

All course materials, including lectures, class notes, quizzes, exams, handouts, presentations, and other course materials provided to students for their courses are protected intellectual property. As such, the unauthorized purchase or sale of these materials may result in disciplinary sanctions under the Student Conduct Code:

<https://studentconduct.wvu.edu/campus-student-code>