

**Department of Physics and Astronomy**  
**Physics 262 (Fall 2022) - University Physics III**

Instructor: Dr. Nirmal Ghimire

**Lecture:** Enterprise Hall 178 (on campus in person), 10:30a-11:45a (M & W)

**Exams:** Enterprise Hall 178 (on campus in person), Sept. 26, Oct. 31, Dec. 7

**Office:** Krasnow Institute - Room 104

**email:** nghimire@gmu.edu

**Office Hours**

- Wednesdays 1p-3p (in-person)
- Remote format: Please send email for time and zoom link

**Text Book:** [University Physics with Modern Physics, vol.1, 2 & 3, 14th Edition](#), by Young and Freedman (with Mastering Physics)

**Prerequisites**

Undergraduate level PHYS 260 Minimum Grade of C or Undergraduate level PHYS 260 Minimum Grade of XS

**Grading**

- Exam #1 (Sept. 26 Mon 10:30a-11:45a) - 25%
- Exam #2 (Oct. 31 Mon 10:30a-11:45a) - 25%
- Final (Dec.7 Wed 10:30a-1:15p) - 30%
- Homework: 10%
- Recitations: 10%

**Important Dates:**

Sept 06: last day to drop classes with 100% tuition refund

Sept 13: last day to drop classes with 50% tuition refund

Sept 14-Sept 27: unrestricted withdrawal period

Sept 28-Oct 24: selective withdrawal period (100% tuition liability)

Nov 30: Last class

**Website**

Blackboard. Homework, reading assignment, lecture notes, and homework solutions will be posted here. Students should upload their homework and exams to the Blackboard.

**Course description**

Physics 262 is the last of a three-semester calculus based introductory physics sequence for science majors. This course covers a wide range of topics including Thermodynamics, Optics, Special Relativity, and Modern Physics. Together with PHYS 160 and 260, the university

physics sequence is designed to give students a working knowledge on the fundamental principles of both classical and modern physics. It also helps you to develop analytical and problem-solving skills which are critical to the learning of every well-educated student.

PHYS 262 together with PHYS 263 fulfills the requirements for **Natural Science with Lab** in the **Mason Core**. [The Mason Core](#) is a foundational selection of courses in a student's curriculum that foster the knowledge and skills needed for academic success.

The general education natural sciences courses engage students in scientific exploration; foster their curiosity; enhance their enthusiasm for science; and enable them to apply scientific knowledge and reasoning to personal, professional and public decision-making. Specially, to achieve these goals, students will aim toward the following Learning Outcomes:

1. Understand how scientific inquiry is based on investigation of evidence from the natural world, and that scientific knowledge and understanding:
  - a) evolves based on new evidence
  - b) differs from personal and cultural beliefs
2. Recognize the scope and limits of science.
3. Recognize and articulate the relationship between the natural sciences and society and the application of science to societal challenges (e.g., health, conservation, sustainability, energy, natural disasters, etc.).
4. Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information).
5. [PHYS 263 | lab component] Participate in scientific inquiry and communicate the elements of the process, including:
  - a) Making careful and systematic observations
  - b) Developing and testing a hypothesis
  - c) Analyzing evidence
  - d) Interpreting results

### **General Class Policy**

Please read this section thoroughly.

**Honor Code:** It is expected that students adhere to the George Mason University Honor Code as it relates to integrity regarding coursework and grades. The Honor Code reads as follows: **To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the University Community have set forth this: Student members of the George Mason University community pledge not to cheat, plagiarize, steal and/or lie in matters related to academic work.** More information about the Honor Code, including definitions of cheating, lying, and plagiarism, can be found at the Office of Academic Integrity website at <http://oai.gmu.edu>.

## **Recitations**

You **MUST** attend all your recitations. 10% of your grade will be evaluated on your participation during recitations.

Recitations are scheduled for every week on the following dates and your first recitation section will start in the **first** week of classes. Your recitation instructor is [Prof. Higginbotham](mailto:khigginb@gmu.edu) (khigginb@gmu.edu). You need to sign up for either one of the following sections:

- Section 301: F 1:30p-2:20p
- Section 302: F 2:30p-3:20p.

## **Homework**

Homework assignments are 10% of your total Grade. You are encouraged to work on your homework assignments together in small groups but copying homework from each other is not allowed. **Homework is due Sunday 11:59 pm.** Late homework will not be accepted except with VALID medical excuse.

The first assignment is a simple tutorial helping you to learn to use the [Mastering Physics Website](#). Although this exercise will not be counted toward your grade; you need to get yourself familiar with Mastering Physics starting in the second week of class.

Tutoring Information: College of Science Tutoring Center, Planetary Hall Basement Room 2  
Time: Please check with the Department of Physics' front office in Planetary 203

## **Examination Policy**

The two exams will typically have 4 problems (or questions). Calculators will be needed for quantitative problems. Materials covered in these two exams will be as follows: (Exam #1 - Ch. 17-20; Exam #2 - Ch. 33-36) but be advised that physical concepts from a later chapter might depend on knowledge from previous chapters. For each exam, one problem with the lowest points will be dropped.

The final exam will have 4 or 5 problems (or questions). Calculators will be needed for quantitative problems. The final exam will be COMPREHENSIVE with additional materials from the remaining chapters 37-41. Similar to the other two exams, one problem with the lowest points will be dropped.

Although every effort will be made to adhere to the examination schedule given in the syllabus, the instructor reserves the right to alter the examination schedule during the semester as the necessity arises. If the examination date falls on an unexpected school closing date due to weather or other events, the examination will be postponed to the next regularly scheduled class meeting.

It is the responsibility of each student to attend classes during scheduled examinations as listed in the syllabus regardless of work or family considerations. Make-up exams will be given only to students with VALID medical excuse and they should contact the instructor as soon as they return to school.

THERE ARE NO DROP OPTIONS FOR EXAMS. All exams (two midterms and one final) will be counted toward your final grade.

If you are a student with a disability and you need academic accommodations, please see me and contact the Disability Resource Center (DRC) at 993-2474. All academic accommodations must be arranged through the DRC.

### **Course Content**

#### **Thermodynamics**

Chapter 17: Temperature and Heat

Chapter 18: Thermal Properties of Matter

Chapter 19: The First Law of Thermodynamics

Chapter 20: The Second Law of Thermodynamics

#### **Optics**

Chapter 33: The Nature and Propagation of Light

Chapter 34: Geometric Optics

Chapter 35: Interference

Chapter 36: Diffraction

#### **Modern Physics**

Chapter 37: Relativity

Chapter 38: Photons: Light Waves Behaving as Particles

Chapter 39: Particles Behaving as Waves

Chapter 40: Quantum Mechanics I: Wave Functions

Chapter 41: Quantum Mechanics II: Atomic Structure

### **Privacy**

Students must use their MasonLive email account to receive important University information, including communications related to this class. I am not allowed to respond to messages sent from or send messages to a non-Mason email address.

### **Notice of mandatory reporting of sexual assault, sexual harassment, interpersonal violence, and stalking**

As a faculty member, I am designated as a “Non-Confidential Employee,” and must report all disclosures of sexual assault, sexual harassment, interpersonal violence, and stalking to Mason’s Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services

(CAPS) at 703-993-2380. You may also seek assistance or support measures from Mason's Title IX Coordinator by calling 703-993-8730, or emailing [titleix@gmu.edu](mailto:titleix@gmu.edu).