Physics 227N/232N/262N: University Physics

Physics 232N/227N/262N is the second semester of a two semester, calculus-based introductory physics course. In this course you will focus on the gaining a solid understanding of the basic principles of electricity and magnetism. The key objectives of the course include developing problem-solving skills, as well as preparing university students for professional careers in science and engineering.

Through in-class activities, mini-lectures, laboratories, reading and homework assignments you will learn how to use critical thinking combined with mathematics to describe simple physical processes and develop basic problem-solving skills. In addition to covering both theory and experiment, we will also use computer simulations to visualize simple physical systems in order to gain insight into the underlying physics. There will be both individual and group activities. Group activities will stress teamwork and communication skills. Unlike the traditional lecture format, in this class we will rely on interactive instruction and cooperative learning.

This syllabus may be modified by the instructor if necessary.

University Catalog  Physics 790/890  
Credit hours 3

Prerequisite/Corequisite  Prerequisite:  Physics 226N/231N/261N, Math 211 (Calculus I) or equivalent with a grade of C or better. Pre- or co-requisite: Math 212 (Calculus II) or permission of instructor. Math proficiency is essential in the following areas: algebra, trigonometry, vectors, and introductory calculus.

Instructor  Dr. Ted C. Rogers  
Office: OCNPS 0327 (Oceanography and Physics)  
Phone: (757) 683-4993  
email: trogers[at]odu.edu

Website  We will be using Blackboard for our course website.

Classes  
Time & Location  Tuesday, Thursday: 10:30 am - 12:20 pm  
Location: OCEANOGRAHPHY BLDG 0142

You must also enroll in a one lab session. Each class period will consist of lectures, interactive discussion, and problem solving. If you have to miss a class, it is your responsibility to find out what you missed.

Office Hours  Tuesdays at 2:00 PM, Learning Resource Center, (2nd floor PSB).

Required Materials  
- “University Physics” by Young and Freedman, 14th ed.  
- MasteringPhysics Student Access (bundled with text).  
  - If you have a used copy of the textbook you can purchase access to MasteringPhysics online (www.masteringphysics.com).
  - Note: You may need much less $$ if you purchase the digital
version of the book from the ODU Bookstore. You will receive an access code to Mastering Physics and a digital copy of the book.

- Bound notebook for your Homework Journal (recommended).

### Homework

*Physics is best learned by attempting to solve problems.* This will allow you to become familiar with the concepts and comfortable with the mathematical methods required. A good portion of in-class time will be spent working on problems. In addition, you will be given one Homework Assignment each week. You will submit your homework solutions online using MasteringPhysics. Use course code: MPROGERS2949385. Assignment solutions will be posted on the Blackboard Physics 22N/232N/262N website.

### Reading Assignments

You will be given a reading assignment each week. You may be given a few reading assignment questions on occasion. *It is essential that you complete your reading assignments.*

### Group Work

Many class activities will require you to work in a group of 2-3 students. Formal group member assignments may be made, if needed, and groups may be periodically changed throughout the semester.

### Laboratory

There are possible laboratory sessions meeting on Wednesday, Thursday, and Fridays. You only need to attend one. Your Laboratory Instructor will provide you with complete details and expectations regarding labs and lab reports. You are allowed only one unexcused lab absence. If you have more than one unexcused lab absence, **you will fail the course.**

### Exams

This course will contain three in-class examinations and a comprehensive final exam. If you must miss an exam, contact Prof. Rogers as soon as possible. Make-up exams may be given on a case-by-case basis, but **you must have a legitimate reason** for missing an exam or you will receive **a zero for the exam!** All examinations are closed book. Tardiness to exams is not acceptable. **If you are more than 10 minutes late to an exam, you will obtain a 0% on the exam.**

Further details of what will be permitted in the exam will be discussed in the weeks approaching the exam.

The exam schedule is as follows:

- **1st Midterm:** Thursday, September 26th, regular class time
- **2nd Midterm:** Thursday, October 24th, regular class time
- **3rd Midterm:** Thursday, November 21st, regular class time
- **Final Exam:** Thursday, December 12th, **12:30-3:30 pm**

(Midterm dates are tentative and subject to change)
Grades
A letter grade will be assigned at the end of the course on the basis of numerical scores obtained from the three in-class exams, the final exam, homework assignments, and lab reports. The contribution from each these to the final grade is as follows:

- In-class exams: 45%
- Final Exam: 30%
- Labs: 15%
- Homework Assignments: 10%

Attendance
Attendance at each lecture is mandatory. If you must miss a class, you are responsible for finding out what information you missed.

Keys to Success
Right motivation, working diligently, effectively and efficiently is the key to success. If you work regularly and allocate enough time each day to practice and complete the assignments on time and keep up with the course, you will get the most out of the course both intellectually and grade-wise.

You should expect to invest about 6-9 hours per week outside of class to succeed in this course. This is consistent with university guidelines (i.e. two to three hours of outside preparation time for every credit hour).

Physics Learning Center
Help with any aspect of physics is available in the Physics Learning Center (2nd floor PSB), Monday-Friday 9am - 5pm.

The Physics Learning Center is a place where students can get together to work on their homework and get assistance, if needed, from physics faculty and grad students. No appointment is necessary. Students in all introductory classes are encouraged to drop by the Learning Center for help on homework, lab, lecture, other course material, or just for a place to work while in the physics building. Note: staffing of the Physics Learning Center starts the second week of classes. More info, including a detailed staffing schedule, can be found at the following link:
http://www.odu.edu/physics/resources/learning-center

Accommodations
Students are encouraged to self-disclose disabilities that have been verified by the Office of Educational Accessibility by providing Accommodation Letters to their instructors early in the semester in order to start receiving accommodations. Accommodations will not be made until the Accommodation Letters are provided to instructors each semester.

In Physics 227N/232N/262N, high professional standards, including ethical standards, are promoted. Plagiarism and cheating are serious offenses and may be punished by failure in the course. The academic integrity code is to be maintained at all times. Students who persistently disrupt a class may be asked to leave for the remainder of the period.
Course Outline

Some topics may be added and some topics omitted at the instructor’s discretion, depending time constraints.

The main topics to be covered are found in Chapters 21-30, 32-36 of “University Physics” by Young and Freedman, 14th ed. They include, but are not limited to:

1. Electric Charges, electric fields and forces
2. Gauss’s Law
3. Electric Potential
4. Electrostatic Energy and Capacitors
5. Electric Currents and Circuits
6. Kirchoff’s Law
7. Magnetism
8. Electromagnetic Induction
9. AC Circuits
10. Maxwell’s Equations and Electromagnetic Waves
11. Geometric Optics