

PHYS 207L: University Physics II with Lab
College of Arts & Sciences Syllabus

COURSE INFORMATION

Credit Hours: 5

Course Description: This is the second course of a two-term calculus based lecture and laboratory sequence intended for students majoring in physics, biology, chemistry, earth science or mathematics. Charges, Coulomb's and Gauss's laws, conductors and dielectrics, Ohm's law, magnetic fields, Ampere's law, motion of charges in a magnetic field, Faraday's law, inductance, simple L.R.C. circuits, magnetic properties of matter, electromagnetic waves, kinematics of wave motion, reflection, refraction, interference, and diffraction are discussed. Lecture: 3 hrs. Lab: 2 hrs.

Course Prerequisites: Undergraduate level PHYS 201 Minimum Grade of C and Undergraduate level MATH 187 Minimum Grade of C or (Undergraduate level PHYS 206 Minimum Grade of C or Undergraduate level PHYS 206L Minimum Grade of C)

FACULTY INFORMATION

Instructor: Paulo H. Acioli

Office Location: BBH 217D

Office Hours: Tuesday 1pm-3pm, Wednesday from 10am-12pm, or by appointment.

Phone Extension: 773-442-4733

E-mail: p-acioli@neu.edu

COURSE MATERIALS

List of Required Texts / Materials:

Matter & Interactions, Ruth Chabay and Bruce Sherwood, John Wiley and Sons, Inc.

COURSE OBJECTIVES / STUDENT LEARNING OUTCOMES

- Apply fundamental principles to a wide range of systems: from nuclei to stars
- Unify mechanics and thermal physics
- Engage students in laboratory exercises and physical modeling (idealization, approximation, assumptions, estimation)
- Make computational physics/modeling an integral component of the course in addition to theory and experiment

STUDENT TASKS / ASSIGNMENTS / REQUIREMENTS

Assignments:

Labs: SEC 01, F 12:00-1:50 pm, in BBH 209

Weekly Lab activities will be held every Thursday with the exception of weeks when an exam is scheduled. The Laboratory Guides will be posted on D2L one week in advance. If it is not posted by 5pm on Friday please send an e-mail to the instructor. Ten Lab assignments (up to 125 points) will count toward the final grade.

Mini-Research Projects

Every student will have to develop a mini-research project that will apply the concepts learned in this course. A peer leader will aid the students in this project providing guidance on how to choose a topic, how to develop it, test it, and on how to report the findings in this project. Some of the Laboratory time will be devoted to this purpose as well. Some of the suggested topics are: Physics of Lightning; Optical Fiber Technology; Signal Amplification; Signal Filtering; Macroscopic manifestation of Induced Electric Dipole of Water; Explaining the Aurora Borealis; Mass Spectroscopy; Magnetic Free Energy Generators; Magnetic Trains; Design your own project

Problem Sets

Weekly problem sets are assigned on D2L. Problem Sets should be completed by the following week.

Reading Quizzes

Online reading "warmup" quizzes (each worth 5.0 points) are administered before every class, with the exception of the first day of class and on classes where there is a midterm. Reading quizzes are based on the material to be covered in class and require reading the assigned chapter of the book. There will be no reading quiz make-ups. The highest ten warmups (up to 50 points) will count towards the final grade.

Exams

This course has two two-hour midterm exams and a two-hour comprehensive final (each worth 100 points). The lowest exam grade or the mini-research project grade will be dropped. You can drop the final exam if you are satisfied with your grade. The exams are largely based on material from lectures and problems similar to those found in the weekly assignments. Exam policies can be found on D2L.

Attendance

Attendance to the Lab is mandatory and students will not receive a grade for missed labs. Each lecture is worth 1 point in the grade, up to a maximum of 25 points.

Grading Policies and Formulae:

The final grade will be based on:

Two highest exam grades (20% each) + Labs (25%) + Mini-research project (20%) + Reading Quizzes (10%) + Attendance (5%)

Any student who achieves a percentile score of 90% or above (450 points), 80% (400 points), 70% (350 points), 60% (300 points) is guaranteed to receive an A, B, C, or D respectively. These percentile scores (or points) may be adjusted downwards based on a class curve and other considerations.

Course Outline:

University Physics II: Tentative Schedule		
Week of	Assigned Reading	Notes
Jan-11	Introduction & Electric Fields	Lab 1 on Jan 15
Jan-18	Electric Fields & Matter	No class on Jan-18 Lab 2 on Jan 22
Jan-25	Electric Field of Charge Distributions	Lab 3 on Jan 29
Feb-01	Elec Field of Charge Distributions/Electric Potential	Lab 4 on Feb 05
Feb-08	Electric Potential	No Lab on Feb. 12
Feb-15	Electric Potential/Magnetic Field	Lab 5 on Feb 19
Feb-22	Magnetic Field/ Elec. Fields and Circuits	Lab 6 on Mar 26
Feb-29	Electric Field and Circuits	Mid-Term on Mar. 04
Mar-07	Circuit Elements	Lab 7 on Mar 11
Mar-17	Magnetic Force	Lab 8 on Mar 17
Mar-21	Spring Break	No Classes
Mar-28	Patterns of Fields in Space	Lab 9 on Apr. 01
Apr-04	Faraday's Law	Mid-Term on Apr. 08
Apr-11	Electromagnetic Radiation	Lab 10 on Apr 15
Apr-18	Waves and Particles	Lab 11 on Apr. 22
Apr-21	Optical Instruments	Project Presentations on Apr. 29
May-02	Review and Final Exam	Final Exam on May 5 at 2PM

COURSE POLICIES AND STATEMENTS

Absence Policy:

Regular attendance of lectures is strongly recommended but is at the discretion of the student. Attendance to the Laboratory sessions is mandatory.

Academic Integrity Policy:

By enrolling in this course, you are bound by the NEIU Student Code of Conduct: <http://www.neiu.edu/university-life/student-rights-and-responsibilities/student-code-conduct>. You will be informed by your instructor of any additional policy specific to your course regarding plagiarism, class disruptions, etc.

ADA Statement:

Northeastern Illinois University (NEIU) complies with the Americans with Disabilities Act (ADA) in making reasonable accommodations for qualified students with disabilities. To request accommodations, students with special needs should make arrangements with the Student Disability Services (SDS) office, located on the main campus in room D104. Contact SDS via (773) 442-4595 or <http://www.neiu.edu/university-life/student-disability-services>.

Campus Safety:

Emergency Procedures and Safety Information can be found on NEIUport on the MyNEIU tab or as follows: http://homepages.neiu.edu/~neiutemp/Emergency_Procedures/MainCampus/.

Course Communication

All pertinent class communications between the instructor and students is conducted exclusively through NEIU e-mail. Thus it is the responsibility of students to check their NEIU e-mail account for all significant information and updates on class cancellations in the event of threatening weather conditions. Communication between the instructor and students via personal e-mail accounts (e.g., @gmail.com or @yahoo.com) will not occur.

Incompletes

Students will have two semesters (including Summer) after the incomplete grade has been assigned to remove the incomplete. Incompletes that have not been removed within two semesters will be changed to an "F" grade.