Spring 2019

PHYS 121-108: Physics II

Slawomir Piatek

PHYSICS 121, Spring 2019
Course Outline
Th. Tiernan 112
6:00 PM – 8:50 PM

INSTRUCTOR: Slawomir Piatek: 423F Tiernan Hall, **piatek@njit.edu**

OFFICE HOURS: T & Th 3:00 PM – 4:00 PM; other times by appointment.

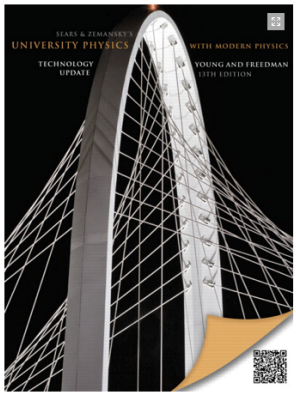
PREREQUISITE (all with a grade C or better): Phys 111 or 111H and Math 111, 111H, or 132

CO-REQUISITES: Phys 121A and Math 112

Failure to meet either co-requisites or pre-requisites will result in student being dropped from class.

COURSE MATERIALS:

- Textbook: *Sears and Zemansky's University Physics with Modern Physics*, 13th Edition Technology Update, by Young and Freedman. The publisher is PEARSON. ISBN-10: 0321897447 • ISBN-13: 9780321897442. NOTE: This textbook was used for Phys 111 and Phys 121 in 2013-2017.



- **Mastering Physics Homework System:** Be sure that your textbook is sold bundled with a Mastering Physics student access code card. Each student must enroll in the course specified by his/her instructor. Homework assignments will be posted on-line. Students login, download and solve the assigned problems, and submit answers to the automated grading system.

  If your textbook does not come bundled with Mastering Physics, you can buy the access directly from the publisher (Pearson) by visiting:
  http://www.pearsonmylabandmastering.com/northamerica/masteringphysics/

ATTENDANCE: It is expected that students will attend all lectures and recitations.

HELP: The Physics Dept. office on the 4th floor of Tiernan has specific information on tutoring. Physics tutoring is available through the CAPE organization, and possibly elsewhere.

GRADING: Your final letter grade in Phys 234 will be based on a composite score for term's work that includes the common exam scores, the final exam, and the homework score.

1) Common Exams Three common exams will be given during the semester. The exam schedule is:

- Common Exam 1: Monday, February 25 4:15 – 5:45 PM
- Common Exam 2: Monday, March 25 4:15 – 5:45 PM
- Common Exam 3: Monday, April 15 4:15 – 5:45 PM
- Comprehensive Final Exam after May 10 2.5 hours long

The general policy is that students who miss a common exam will receive a score of zero for that exam. That score will be included in the calculation of your final grade. Students that miss two common exams automatically fail the course. Students who anticipate an absence from a common exam should discuss their situation with their instructor prior to their absence. In order to be qualified to receive a "make-up" common exam score (a very rare occurrence), the student should present documentation for not being able to take the test as scheduled. As is the standard policy of NJIT, this documentation should be presented to the student's Physics 121 instructor and to the Dean of Students - (973) 596-3466, 2nd floor Campbell Entry. Both the Physics 121 instructor and Dean of Students must concur in permitting a "make-up" common exam. Students who miss common exams that do not present documentation within 7 days of the common exam will receive a score of zero for the common exam.

In the event that the above qualification is met, a separate make-up test for the missed common exam will not be offered. Instead, the portion of the final exam relevant to the contents of the missed test will be considered for giving a grade for the missed test. The instructor will evaluate the final exam questions from those chapters and normalize this portion of the student's grade for the missed common quiz.

2) Homework assignments will be posted on-line using the Mastering Physics Homework System**:** **www.masteringphysics.com.**. For Dr. Piatek section, please use the following course ID (no quotes): "MPPIATEK121S19". Homework due dates will be announced.

3) Final Exam: After May 10, TBA

FINAL LETTER GRADES: will be based on a term average for the semester's work that includes the three common exam scores, the final exam, and the term's homework score. Here are the approximate weights to be used for calculating term averages:

- **48%** for all three common exams (16% each)
- **32%** for the final exam
- **20%** for the total of homework

The conversion of term average values to letter grades will use the following cutoff values:

- **85% for A, 75% for B+, 65% for B, 56% for C+, 50% for C, and D or F below 50%.**

STUDENTS WITH DISABILITIES: If you need accommodations due to a disability please contact Chantonette Lyles, Associate Director of Disability Support Services, Fenster Hall Room 260 to discuss your specific needs. A Letter of Accommodation Eligibility from the Disability Support Services office authorizing your accommodations will be required.

HONOR CODE STATEMENT: NJIT has a zero-tolerance policy for cheating of any kind and for student behavior that disrupts learning by others. Violations will be reported to the Dean of Students. The penalties range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT. Avoid situations where your own behavior could be misinterpreted as dishonorable. **Students are required to agree to the NJIT Honor Code on each exam, assignment, quiz, etc. for the course.**

Turn off all cellular phones, wireless devices, computers, and messaging devices of all kinds during classes and exams. Please do not eat, drink, or create noise in class that interferes with the work of other students or instructors. Creating noise or otherwise interfering with the work of the class will not be tolerated

Class Calendar

Date	Topic	Text reading
Lecture 1, 1/24/19	Vectors; Electric Charge & Force	Sec. 21.1 – 3
Lecture 2, 1/31/19	Electric Field	Sec. 21.4 – 7
Lecture 3, 2/7/19	Gauss' Law	Sec. 22.1 – 5
Lecture 4, 2/14/19	Electric Potential	Sec. 23.1 – 5
Lecture 5, 2/21/19	Capacitance	Sec. 24.1– 6
Lecture 6, 2/28/19	Current, Resistance, DC Circuits, Intro to Kirchhoff's Rules	Sec. 25.1 – 5 Sec. 26.1 – 2
Lecture 7, 3/7/19	Multi-loop and RC Circuits	Sec. 26.2 – 5
Lecture 8, 3/14/19	Charges & Currents in Magnetic Fields	Sec. 27.1 – 8
Lecture 9, 3/28/19	Sources of Magnetic Field. The Biot-Savart Law, Amperes Law	Sec. 28.1- 7
Lecture 10, 4/4/19	Faraday's Law of Induction	Sec. 29.1 – 5
Lecture 11, 4/11/19	Inductance, RL Circuits	Sec. 30.1 – 4
Lecture 12, 4/18/19	LC & LCR Circuits, EM Oscillations, AC Circuits	Sec. 30.5 - 6 Sec. 31.1 – 2
Lecture 13, 4/25/19	AC Circuits, Resonance	Sec. 31.3 - 6
Lecture 14, 5/2/19	Review and problem solving	Review all sections

Tuesday, May 7 follows a Friday schedule
Spring break: 3/17 – 3/24
Reading days: May 8 & 9
Final exam period: May 10 – May 16

LEARNING OUTCOMES:

Students will be expected to demonstrate understanding and mastery of calculus-based classical electricity and magnetism up to AC circuits, not including Maxwell's Equations or beyond. The topics covered include electric charge, electric and magnetic fields, forces on stationary and moving charges and currents due to electrostatic and magnetic fields, electrostatic potential and potential energy, Gauss' Law, capacitance, current, resistance, DC circuits, the Biot-Savart Law, Ampere's Law, Faraday's Law, inductance, RC circuits, LR circuits, LCR circuits, AC circuits including "phasor diagrams" and resonant oscillations.

In any/all of the above subject areas, students should be able to do the following:

- Recall and use the conceptual and mathematical definitions and be able to explain them.
- Understand the conceptual and mathematical relationships between quantities used.
- Explain and manipulate equations and techniques developed in the text, lectures, problem examples, and in the course of working problems.
- Use symmetry arguments, sketches and diagrams, graphs, field sketches, algebra, trigonometry, and basic integral and differential calculus methods for reasoning about nature and in setting up and solving textbook-level problems.
- Critically evaluate the soundness and precision of their own answers, explain and interpret their solutions to problems in a way that shows understanding, and identify and appraise the range of applicability of their results, and state limitations of their solutions.
- Apply the skills above to successfully solve textbook-level problems with numeric, symbolic, or conceptual answers.

Learning outcomes are assessed by means of 3 common exams, a final exam, scores on homework assignments, in-class quizzes, and class participation scores.