50:750:132 Elements of Physics II

Instructor	Cory Trout	E-mail	cjt122@scarletmail.rutgers.edu
Office	CNS 216C	Office Hours	TBA

Class meeting time: Tuesday & Thursday, 3:35 p.m. – 4:55 p.m.

Text: "**Fundamentals of Physics**, "David Halliday, Robert Resnick, Jearl Walker" Vol. 1 – 10th Edition.

ISBN : 978-0470469088, *Hardcover*, contains both Vol. 1 & 2

ISBN : 978-0470564738, *Binder version*, contains both Vol. 1 & 2 (best value)

You are welcome to purchase older versions of this text, but please be aware that I will be assigning readings and homework problems based on the 10th edition. If you choose to use an older edition, you will be responsible for cross-referencing assigned chapter readings and homework problems.

Description:
This course is the second part of the Elements of Physics tandem, which are calculus-based physics courses taught mostly to Physics, Chemistry, and Engineering majors. Algebra, trigonometry, and calculus concepts are heavily utilized in this course and students should be comfortable with these concepts See the end of this document for a tentative outline.

During the course of this semester you will become familiar with the motion of electrons as it pertains to electricity and magnetism. In the process, I hope that you will therefore gain a better understanding of what it takes to power modern technology. In addition, you will gain familiarity with the properties of light and how optics can manipulate light. Such knowledge will help to understand how visual aids such as telescopes and polarized sunglasses function.

Co-requisite: 50:750:134 Laboratory. The grade for the laboratory is assigned by the laboratory instructor and is separate from the lecture grade.

Specific Student Learning Outcomes (SLOs) Objectives:

1. Understand the problem-solving process and develop critical thinking skills
2. Describe magnetic fields and electromagnetic induction
3. Understand electric circuits and the relationship between voltage, current and resistance.
4. Gain an introduction to the nature of electromagnetic waves
5. Describe optics and phenomena such as polarization, refraction, and reflection

Details:
1) I will be available during office hours to provide you will help on the course material and answer any questions you may have. If you need assistance outside of office hours, please email me to schedule a time.
2) ***There are no make-up exams***. If you miss an exam, you must provide a written medical excuse or the equivalent. If the excuse is accepted, you receive the average of the other three exams that you will have completed. If you miss the final exam, you will need a medical excuse ***and*** must contact the instructor within 48 hours of the final to discuss your options.
3) Homework assignments will be assigned through OpenStax on a weekly basis and will be worth 15% of your total grade. These problems are meant to act as steppingstones toward harder open-ended problems from the textbook.

4) Open-ended homework will be assigned for each chapter but will not be collected nor graded. You are strongly advised to have tried all problems by the due date. I typically review some of the problems in class and you will gain the most benefit from this if you have done the homework problems beforehand. The exams will be based on the homework and the lecture notes.

5) In addition to exams, I reserve the right to administer quizzes that will count towards your final grade. There will be no make-up quizzes. Students missing a lecture quiz will receive a zero for that quiz. The lecture quizzes are intended to assess your study habits and help you stay on track.

Grading:

- 3 Hourly Examinations (3 semester) – total 60% of final grade
- 6 Quizzes – total of 25% of the final grade
- OpenStax Assignments – total of 15% of final grade
- Specific questions regarding exam points are permitted, however, all disputes must be presented within one week of receiving your exam grade. I.e., I will not consider any exam grade changes at the end of the semester.
- A curve may or may not be implemented depending on the class average. Do not count on a curve as it is not guaranteed. If a curve is not applied, letter grades will be assigned based on the following ranges:

A	89.50 - 100%		C	66.50 - 75.49%
B+	86.50 - 89.49%		D	55.50 - 66.49%
B	79.50 - 86.49%		F	<55.49%
C+	75.50 - 79.49%			

*Please note, these numbers already reflect rounding, and no additional rounding will be implemented. Emails requesting additional grade rounding will not be responded to.

This grading rubric is subject to change if the instructor finds a curve or additional assignments necessary to properly assess the students.

Instructor's Statement:

- Do not engage in any form of academic dishonesty. I will report all violations of academic integrity to the University. If you do not know what academic dishonesty is, please consult this statement:
  Rutgers University Academic Integrity Policy

- Please note that it is necessary to explain all steps that you take on exams – make an effort to **clearly** show your work. Full or partial credit will only be granted for answers that can be clearly followed. Answers without justification will not be accepted (even if the final answer is correct)!

- Do not use cell phones in class or disrupt class in any way. If you do so, you will be asked to leave and will not be welcomed back for the rest of the class period.

- You are not permitted to record class.

- Attending the lecture is not enough. Take notes in class and read the relevant sections in the textbook. In addition, make sure to review all example problems and attempt all the homework problems.

Class Resources:

Lecture notes, answer keys, homework solutions, and announcements will all be posted on the course's Canvas site.
https://canvas.rutgers.edu/

Tentative Class Outline:

Chapter 21: Electric Charge
Chapter 22: Electric Field
Chapter 23: Gauss' Law
Chapter 24: Electric Potential
Test 1

Chapter 25: Capacitance
Chapter 26: Current and Resistance
Chapter 27: Circuits
Chapter 28: Magnetic Fields
Chapter 29: Magnetic Fields Due to Currents
Test 2

Chapter 30: Induction and Inductance
Chapter 31: Electromagnetic Oscillations and Alternating Current
Chapter 33: Electromagnetic Waves
Chapter 34: Images
Chapter 35: Interference
Chapter 36: Diffraction
Final Exam