Contact Information

Instructor: JJ Naddeo

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Office Material Physics Laboratory (BSB-406,416,417 )

Office Hours: By arrangement

Course Webpage: Sakai

CO-Requisite: 50:750:134 must be taken concurrently with either 50:750:206 or 50:750:132.

This course assumes knowledge of pre-calculus level mathematics. As the lab course is open to both Elements of Physics and General Physics students, techniques that involve the use of simple calculus may be used. However, any mathematical techniques beyond the pre-calculus level will be taught during the lab. Course Objectives Students will conduct laboratory exercises, demonstrating phenomena discussed in the lecture course. These exercises will aid the students in learning concepts related to general electromagnetism, electric circuits, and optics. Students will also learn to apply such concepts to engineer creative and individualized solutions to physics problems.

Course Outline

Note: The order in which the labs will be performed is subject to change.

Week 1 _ Charge and Electric Fields

Week 2 _ Introduction to Electric Circuits and Ohm's Law

Week 3-4_ Kirchoff's Laws and Equivalent Resistance

Week 5 _ The RC Circuit

Week 6 _ Electromagnetic Induction, Oscilloscopes, Magnetic Fields

Week 7 _ Practical 1: Circuits

Week 8 _ Intro to EM Waves and Optics, Speed of Light, Fresnel Reflections

Week 9 _ Snell's Law & Dispersion

Week 10 _ Spherical Lenses, Lens Maker's Equation, Chromatic Aberration

Week 12 _ Fiber Optics

Week 12 _ Polarized Light

Week 13 _ Interference

Week 14 _ Practical 2: Optics

Assessments and Grading

Assessments

Practical Assessments 50%

The purpose of a lab course is to familiarize students with the concepts and procedures used in a laboratory setting. As such, the assessments in a lab course should include more than written theory. Practical quizzes will be given at least twice during the semester. Students will need to be able to demonstrate the ability to collect and interpret data, and draw logical conclusions from that data.

Lab Reports 50%

Assignments given following a lab must be submitted before the start of the next lab. Late Lab reports will be accepted for credit diminishing by one half for each week past due. Students may submit work in groups no larger than three. Students must be present to receive credit for the lab. Submitting a lab report using data collected by another without participating in the activity is a violation of the Academic Integrity Policy of Rutgers University and will not be tolerated. Students arriving more than fifteen minutes after the start of the lab will have missed a significant amount of information related to the proper procedures for the lab activity, and will not be permitted to participate. If a student is unable to attend a lab, he/she may make up a lab in another section provided that the instructor of that section gives his/her permission. Students attending another section must also inform his/her instructor of the change via email. Students who fail to complete a lab will be assigned a score of zero for that lab unless the existence of exigent circumstances that precluded the his/her attendance can be demonstrated. In such cases, it is the responsibility of the student to make arrangements to complete the lab activity. If a student has not turned in at least two lab reports the student will lose 1 letter grade (A to B) for each additional missing report i.e. Three missing reports will drop you from an A to a B, Four will drop you from a B to C etc...

Students must complete the entire lab activity to receive credit. Some lab activities may not require the full 3 hour lab period, however some will. Do not schedule other activities or classes during the lab period. Lab reports submitted by students who leave before the conclusion of the lab activity will not be accepted.

Academic Integrity Policy

Students are expected to be aware of Rutgers University's Academic Integrity Policy available at academicintegrity.rutgers.edu. Breaches of academic integrity can result in consequences ranging from reprimand to expulsion. Do not use cellphones in the lab or disrupt class in any way. If you do so, you will be asked to leave and will not be welcome back for the rest of the class period. You will receive a zero for any assignments that you miss as a result, and will be responsible for learning any missed material on your own. No cell phones may be used during any quiz or exam. Use of a cell phone during a quiz will be considered cheating and will result in a grade of zero for the assignment. Calculators used for any purpose other than mathematical computations, will be considered cheating and in violation of Rutgers University code of student conduct. Calculators may not be shared during a quiz; bring your own. Cell phones, blackberries, etc. cannot be used as calculators during a quiz.