Intro Physics Lab I 50:750:133

Instructor	JJ Naddeo	**E-Mail**	**jnaddeo@gmail.com**
Office	N/a	**Office Hours**	By Arrangement
		Course Webpage	Sakai.rutgers.edu

Pre-requisites and Co-requisites

50:750:133 must be taken concurrently with either 50:750:203 or 50:750:131.

Students not registered for lecture will be dropped from the course.

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 are designed to aid students in developing analytical ability, develop proper practices in experimentation, and to effect a degree of familiarity with a variety of open source software tools commonly used in a physics research setting. The course will focus on teaching skills including clean presentation and formatting of experimental data, statistical error analysis, automation of analysis of large sets of data using Python, and techniques for simple numerical modeling of physical phenomena.

Tentative Course Outline

Week	Lab Activity	Topics
1	Review of Prerequisites Topics/ Freefall	Presentation and Formatting of Experimental Data
2	Forces	Statistical Error Analysis
3	Hooke's Law	
4	Mechanical Advantage/Work	
5	Conservation of Linear Momentum	Advanced Error Analysis
6	Conservation of Energy	
7	Uniform Circular Motion	
8	Rotational Motion: Atwood's Machine	Graphical Analysis
8	Torque	
9	Simple Harmonic Motion	Linearizing Data
10	The Simple Pendulum	Modeling data
11	Physical Pendula	
12	Projectile Motion	
13	Waves	Oscilloscopes
14	*Practical*	

Assessments and Grading

Assessments 50%

Semi-regular quizzes may be given on topics covered during the semester. No make-up quizzes will be given.. Quizzes may be excused at the discretion of the instructor upon demonstration of exigent circumstance that precluded the student's attendance. In such cases, the student's grade will be composed of the average of the remaining grades.

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 also be given at least once during the semester. Students will need to be able to demonstrate the ability to collect and I nterpret data, and draw logical conclusions from that data.

Lab Assignments 50%

Written assignments will be due every two to three weeks at the beginning of lab. Assignments not submitted before their due date will be accepted for credit diminishing by one half for each week past due. Each student must submit his/her own lab report. Students must be present for all relevant labs to receive credit for the report. Submitting a lab report using data collected by another without participating in the activity is not acceptable. Sign-in and/or sign-out sheets will be used during each lab. It is the responsibility of the student to ensure that he/she signs the attendance sheet(s). If a student's name is does not appear on the attendance sheet for a given lab, no credit will be given for the lab report. 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 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. Labs that remain incomplete at the end of the semester will be assigned a score of zero.

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.

Pre-Lab Activities

Ungraded pre-lab assignments will be given for some labs. These activities will generally take the form of reading assignments to provide background information on the tools that will be used in the lab that week.

Submissions and Lab Requirements

All written lab assignments must be submitted via the Sakai dropbox **in Portable Document Format (.pdf)**. Assignments submitted in **.doc or .docx file formats are not acceptable, and will not be graded**. Filenames should be of the form: `labtitle.firstname-lastname.*`

Some projects throughout the semester will involve the modification of Python scripts. These assignments must be submitted with a README file (plain-text or pdf) describing the changes made. The project should be submitted as a single **.zip** file. **Do not submit multiple files.** All files must be inside the zip archive.

For all assignments: Filenames should never contain spaces.

Filenames like this: `'FIrst physic lab report!!11!.tar.gz'` are not helpful.

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. Cell phones, blackberries, etc. cannot be used as calculators during a quiz. 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.**