

Summer 2020

PHYS 111A-450: Physics I Lab

George Georgiou

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INSTRUCTOR	George Georgiou, E-mail: george.e.georgiou@njit.edu
OFFICE HOURS	Hours and Location: TBD
TEXTBOOK	Physics 111A Laboratory Manual, 9 th Edition, sold by NJIT bookstore
DESCRIPTION	This physics I laboratory course involves experiments which demonstrate the principles of Elementary mechanics including rectilinear and circular motion; equilibrium and Newton's laws of motion; work, energy, momentum; the conservation laws.
NOTE	In order to take the laboratory course, PHYS 111A, a student must take concurrently the lecture course, PHYS 111 unless the student passed the lecture course previously. Withdrawal from either course will cause a simultaneous withdrawal from both courses.
HELP	<ul style="list-style-type: none"> - Visit or email your instructor if you are having trouble with the lab course; - If you need accommodations due to a disability, please contact Chantonette (LylesChantonette.Lyles@njit.edu), Associate Director of Disability Support Services, to discuss your specific needs.
GENERAL INFORMATION	<ul style="list-style-type: none"> - There is no exam in the lab course. - No make-ups for missing labs are allowed. - Grading (A through D and F) is based on attendance, participation and lab report. - Experiments are a group effort. - Laboratory report should be individual one submitted by each student.
LEARNING OBJECTIVES	<ul style="list-style-type: none"> - Students will master basic physics concepts by performing an experiment relevant to a corresponding course work. - Students will gain hands-on experiences with experimental processes and develop effective written communication skills. - Students should develop collaborative learning skills by working in a group.
LEARNING OUTCOMES	<ul style="list-style-type: none"> - Students will demonstrate basic experimental skills by the practice of setting up and conducting an experiment. - Students will demonstrate an understanding of the analytical methods required to interpret and analyze results and draw conclusions as supported by their data - Students will demonstrate basic communication skills by working in groups on laboratory experiments and the thoughtful discussion and interpretation of data.
ATTENDANCE	<ul style="list-style-type: none"> - Attendance policy is very strict. It is a student's responsibility to confirm his/her attendance with Lab instructor. - It is required for students to attend all lab experiments since grading is based on attendance, participation and lab report. - It is required for a student to sign the attendance sheet in every lab class. If a student fails to sign it, it is considered to be absent. - Attendance will be checked in the beginning and middle of each class by your instructor. - If a student does not appeal and resolve his/her attendance within 7 days, no further complaint will be accepted. - If a student makes more than 3 unexcused absences, the student is very likely to fail the lab course. - If a student has excusable absences, the student should contact the dean of student office to email an official excuse to his/her lab instructor.
GRADING POLICY	<ol style="list-style-type: none"> 1. The grading guidelines are as follows: Attendance (20%); Participation (20%); Laboratory Report (60%) 2. A grade of zero (0) will be given for any missed experiment with no excuse. 3. Submission of lab report is due the following week class begins – penalty for lateness is 10 % per day. 4. Laboratory Report Grading (points): <ul style="list-style-type: none"> - Style; font type, font size, line space, margin, etc. given by your lab instructor (5)

	<ul style="list-style-type: none"> - Title (5) - Introduction including Objective and Theoretical Background (5) - Experimental Procedure (5) - Results: Experimental Data (15) and Calculation (15) - Discussion and analysis of results; Answers to questions (40) - Conclusions (10) - Raw Data Sheet (5); unless otherwise instructed, raw data sheets (or photocopies of raw data) should be attached in the lab report. The raw data should be checked and signed by your instructor at the completion of lab experiment.
GRADING SCALE	90 - 100 % = A, 85 - 89 % = B+, 80 - 84 % = B, 75 - 79 % = C+, 70 - 74 % = C, 50 - 64 % = D, 0 - 49 % = F

LAB COURSE SCHEDULE

	Date	Experiment
1	5/19 (T)	Introduction
2	5/20 (W)	Lab 109: One-Dimensional Motion--Velocity as a Function of Time and Distance at Constant Acceleration
3	5/21 (R)	Lab 111: Projectile Motion
4	5/26 (T)	Lab 112: Newton's Second Law
5	5/27 (W)	Lab 103: Translational Static Equilibrium---Force Table
6	5/28 (R)	Lab 106: Static and Kinetic Frictions
7	6/2 (T)	Lab 6a1: Work and Kinetic Energy
8	6/3 (W)	Lab 125: Conservation of Energy in Spring-Mass System
9	6/4 (R)	Lab 126: Conservation of Momentum and Impulse-Momentum Theorem
10	6/9 (T)	Lab 114: Uniform Circular Motion
11	6/10 (W)	Lab 9a1: Moment of Inertia and Rotational Energy
12	6/11 (R)	Lab 127: Torque and Rotational Inertia
13	6/16 (T)	Lab 121: Rotational Static Equilibrium---Forces on a Strut
14	6/17 (W)	Lab 7: Archimedes' Principle and Density

The experiment data collection is done for you.

You read values from a data file, perform data analysis/calculation, and to write a lab report.

Files are uploaded to canvas.

You need to download the capstone software needed to open the capstone .cap files.

<https://www.pasco.com/products/software/capstone#downloads-panel>

The lab reports for the entire week will be due on Sunday midnight. For example, the lab reports on 5/19-5/21 will be due on 5/24.