

Physics 151 Syllabus for Fall 2017

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1 Basic Course Information

PHYS 151 - Physics Laboratory. One credit hour course with selected experiments designed to accompany PHYS 150. One two-hour laboratory per week. All lab manuals and prelabs will be made available on Blackboard.

Class Times:

- Lab Sections A: 9:00 - 10:50 AM, on Mondays.
- Lab Sections B: 2:00 - 3:50 PM, on Mondays.

Instructors: Matt Dwyer (TA) and George Coutrakon (PHYS 150 Professor)

Office Hours: By Appointment

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2 Course Goals and Student Learning Outcomes

2.1 Course Goals:

- Develop an understanding of basic scientific concepts, principles and laws of physics through laboratory activities.
- Develop critical thinking skills and a scientific approach to problem solving through laboratory activities.
- Develop basic physical measurement and quantitative analysis skills and methods through laboratory activities.

2.2 Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- make measurements of physical quantities and use those measurements to describe the basic physical concepts of force, motion, velocities, accelerations, and Newton's Laws.
- make measurements of physical quantities and use those measurements to describe the basic physical concepts of work, energy and conservation of energy.
- make measurements of physical quantities and use those measurements to describe the basic physical concepts of momentum and torque.
- make measurements of physical quantities and use those measurements to describe the basic physical concepts of the waves, vibrations, and sound.
- make measurements of physical quantities and use those measurements to describe the basic physical concepts of fluids.
- make measurements of physical quantities and use those measurements to describe the basic physical concepts of heat.
- make measurements of physical quantities and use those measurements to describe the basic physical concepts of electricity and magnetism.
- make measurements of physical quantities and use those measurements to describe the basic physical concepts of optics.
- correlate and use the above practical, engaged laboratory experiences to the contents of the co-requisite course PHYS 150.

3 Lab Details

3.1 Lab Handouts

All labs and prelabs are available on Blackboard. Students must print them out, read them and bring them to each lab session. Note that most labs have a "Prelab" that must be completed and handed in at the beginning of the lab period to receive the indicated points.

3.2 Submission of Weekly Lab Reports

Students will have 1 week to complete their lab reports after doing a lab experiment. Students must turn in a paper copy of their lab report to their TA at the beginning of the following week's lab session. It can be turned in a week late for a 30% grade reduction. After that, no credit is given.

Starting with the first Experimental Lab students must upload their lab report to Blackboard's SafeAssign system and attach a printout of the first page of the resulting SafeAssign report to the paper copy of the lab report they turn in to their TA. Instructions are provided on Blackboard for how to do the SafeAssign submission.

3.3 Passing the Course

You must receive a minimum of 50% of the total possible points of the lab reports. For details, see Grading of lab reports. Failing this lab course PHYS 151 does NOT affect to the grades of PHYD 150 course. Reports are due one week after the lab session and must be handed in to your TA at the start of the lab session. Missing the lab will result in 0 points. You can makeup a lab **if** you contact the lab TA prior to the lab and get their approval for legitimate reasons like family emergency, illness. Note: documentation may be required.

3.4 Grading Scale

There is no set grading scale. The course will be graded on a curve, with the average GPA for the course being set at 3.14 *if there is a sense of honest effort being put forth by the entire class, which I'll define as an average of 70% on all assignments*. This means that if the class average is 70%, a 70% will earn you between a B and B+. Otherwise, the average GPA will be set lower.

However, you will never be curved downwards. An 80% will always be a B-, 90% always an A- etc.

3.5 Misc. Details

Schedule of tests: There are no written tests for this lab course.

Course notebook: Students are strongly encouraged to keep a separated Course Notebook (Lab notebook) of key materials from PHYS 150. Materials include (must be current): Syllabus, lab instruction (manual)(printed from Blackboard with room to take notes), student's class notes, data, etc.

What to bring to class: Lab manual (printed from Blackboard), Notebook, text book (of PHYS 150), graphing paper, USB drive, and calculator.

Accessibility: Northern Illinois University is committed to providing an accessible educational environment in collaboration with the Disability Resource Center (DRC). Any student requiring an academic accommodation due to a disability should let his or her faculty member know as soon as possible. Students who need academic accommodations based on the impact of a disability will be encouraged to contact the DRC if they have not done so already. The DRC is located on the 4th floor of the Health Services Building, and can be reached at 815-753-1303 (V) or drc@niu.edu.

Lab Policies:

- Be respectful of each other (this applies to Instructors, TA's and students). Some specifics include:
 - Follow the TAs instructions and the equipment setup described in the Lab Experimental document. Note: TAs can deduct points if students break lab equipment, don't follow instructions or are disruptive.
 - Use of cell phones/ tablets/ computers during lab is limited to lab related activities.
- TA's can assign and change seat assignments to facilitate lab management.
- Be aware of the policies and procedures regarding your rights as well as responsibilities that are published in the NIU student code of conduct. It is available on line at:
<https://niu.edu/conduct/student-code-of-conduct/index.shtml>.
- The instructor and the university reserve the right to modify, amend, or change the lab syllabus (course requirements, grading policy, etc.) as the curriculum and/or program require.
- If you feel there was an error in the grading of a lab report, discuss your specific questions with your TA.

4 Lab Formats and Grades

4.1 Grading of Lab Reports

Problem Solving Labs - 25 possible points per lab.

- 5 Points for participation (Doing the Lab).
- 10 Points for data collection (Writing up the data you gathered in your lab report.)
- 10 points for observations written in your lab report.
- **Note:** Missing the lab is an automatic deduction of 5 points (Participation). You may still turn in the lab by getting data from one of your lab partners, but the maximum points possible would be 20.

Experimental Lab - 100 possible points per lab.

- 15 points for Prelab Exercise that you must complete and hand in at the beginning of your Lab session.
- 5 points for a description of your setup with a labeled image (either a picture of the setup or a drawing).
- 20 points for Theory section.
- 30 points for Data Collection (writing up the data you gathered in your lab report neatly and concisely).
- 30 points for Observations written in your lab report.
- **Note:** Missing the lab will result in 0 points. You can makeup a lab if you contact the lab TA prior to the lab and get their approval.

4.2 Lab Report Rules

- **Academic Honesty**
 - You should work together with your lab partners in taking and analyzing data, and you will find that discussing the experiment with your partners helps you to understand the results. However, you should record your own data, and the lab reports that you turn in must be your own work in your own words. You cannot copy or paraphrase ANY portion of your partner's reports, doing so will be considered plagiarism. Please refer to the section on Academic Misconduct in the NIU Student Code of Conduct.
- Lab reports must be typed and stapled, no hand written lab reports will be accepted. Use an NIU computer since equation editor is installed on all of them. Graphs must be done using Excel.

- Lab reports consist of a Data Collection and Observation sections (Problem Solving Labs) and Theory, Data Collection and Observation sections (Experimental Labs).

4.3 Lab Report Format

- Name Block - upper right corner.
 - Your name.
 - Date (When you did the lab.)
 - Names of your lab partners (Correct spelling of first and last names, please.)
 - Lab Section (e.g. "A, 10:00 AM Monday", etc.)
- Title - Name of the Lab Experiment
- Theory (Experimental Labs only)
 - State the physics theory, objectives and formulas that are explored in this lab using your own words.
 - Comment on how the results of your experiment compare to the theory/objective of the lab.
 - One paragraph is sufficient.
- Data Collection
 - Tables must have a title and appropriate units (meters, seconds, etc.).
 - Use Excel to produce all graphs.
 - Graphs must be titled with labels and units on the axes.
 - Show all equations that are used to produce the tables and graphs.
- Observations
 - Answers to each question should be a paragraph in length, numbered to match the questions in the lab report. Failure to write complete paragraphs with a justification for your answer will result in point deductions.
 - Each question that is skipped will result in point deductions.

5 Lab Schedule

Section A - 9:00 - 10:50 AM Mondays

Section B - 2:00 - 3:50 PM Mondays

Date	Lab Title
8/28	Precourse quiz
9/4	Labor Day (No classes on Monday)
9/11	Orientation and Graph problem solving lab
9/18	Experimental Lab #1 Motion & Push/ Pull Forces
9/25	Experimental Lab #2 Velocity, Acceleration, 2d Motion
10/2	Experimental Lab #3 Newton's 3rd Law
10/9	Experimental Lab #4 Friction
10/16	Experimental Lab #5 Specific Heat
10/23	Experimental Lab #6 Static Electricity/Coulomb's Law
10/30	Experimental Lab #7 Ohm's Law
11/6	Experimental Lab #8 SHM & Energy
11/13	Experimental Lab #9 Reflection, Refraction, Dispersion
11/20	Experimental Lab #10 Light Intensity
11/27	Hand in Final Lab report
12/4	No Lab