

PHYS 151 SYLLABUS Spring 2018 (version 1e)

**PHYS 151 Labs: Section A Mon 9-10:50; Section B Mon 13-14:50; FR 235
(PHYS 150 Lecture Course: Section 1 Mon 12:00-12:50; LaT 200)**

COURSE:	Physics Laboratory at Northern Illinois University
Catalog Description:	PHYS 151 - Physics Laboratory (1 credit) Selected experiments designed to accompany PHYS 150. One two-hour laboratory per week.
Requisites:	CRQ: PHYS 150
Credit hours:	1 credits. One two-hour laboratory per week.
Method of delivery:	Laboratory (hands-on).
Remarks:	The combined four credits of this PHYS 151 (1 credits) and the co-requisite lecture course PHYS 150 (3 credits) are equivalent to the NIU course labeled PHYS 150A (4 credits) which was offered until the 2016 Spring semester. Failing this lab course PHYS 151 does NOT affect to the grades of PHYS 150 course. However, dropping out of PHYS 150 lecture (a required co-requisite for this course) will mean that the registrar will automatically drop you from PHYS 151 lab.
CLASS MEETINGS:	Every Monday. Lab Sections: A: 9:00-10:50 AM, B: 1:00-2:50 PM @Faraday Hall (FR) 235
Text and materials:	Lab modules – available on Blackboard or course website.
Lecture Instructor:	Carol Thompson, LaTourette Hall 207, 815-753-1772, cthompson@niu.edu
Laboratory TA:	Marc Pavlik, Z1726445@students.niu.edu
Office Hours:	Thompson: Monday 3:30-5:30 and by appointment. (just contact me!) Pavlik: may often be available in lab Monday after section B is completed

A. Preparing for the Laboratory session

[Pre-lab] Note that most labs have a posted “Prelab” set of exercises that must be completed and handed in to the TA at the beginning of the lab period to receive the indicated points.

[Lab handout] Students should read the lab handout prior to lab class. (Handout will be available on Blackboard) or the course web page). Please bring a printed version to the lab session as it has the instructions and steps for successfully completing the lab, as well as data tables, charts, and a variety of questions that document the results and observations during the lab session.

[Preliminary Observations] Most labs will have a page of Preliminary observations that should be turned in immediately at the end of the class session or are signed by the TA and will count for 5 points of the laboratory report credit.

[What to bring to class] Printout of the current class lab module). A notebook for notes, and a copy of the Phys 150 text book is useful! a USB drive/memory stick, and calculator. If a set of lab partners do not have access to a smartphone (for taking the required photos for the methods sections), please discuss with the TA how to get photos taken during a lab. Before leaving lab, make sure that you and your partner have copies of the photos taken for the lab methods section.

B. Submission of Lab Reports (Weekly – via SafeAssign on Blackboard)

Students have 1 week to complete their lab reports after doing a lab experiment.

Turning in the lab report entails the following:

- 1) Students must upload an electronic version (pdf or word file) of their lab report to Blackboard's SafeAssign system.
- 2) You may NOT upload a 'scanned' copy of the report as this does NOT meet the requirements for using SafeAssign. Handwritten reports are not acceptable.
 - a) We suggest using an NIU computer since an equation editor and Excel is installed on all of them.
 - b) Graphs must be done using Excel or Libreoffice or similar graphing program.
- 3) There are three sections in the Phys 150 lab report where student prose is used to assess their own understanding of the concepts and the activities of the lab. These are the Theory/Background section, any explanatory material in the Results section, and answers to questions in the Discussion section. The TA/instructor may choose to not accept a report due to plagiarism. If you feel that the SafeAssign plagiarism report is in error, please discuss with the TA/instructor.
- 4) If you feel there was an error in the grading of a lab report, discuss your specific questions promptly with your TA or instructor.

C. Course Grading

If a student is absent for a laboratory or activity, their score for that activity will be zero.

There are typically no makeup laboratories sessions available.

Laboratorys (#1, #2, ...)

70 points total per Laboratory

10 points: Pre-Lab exercise (must be completed and turned in BEFORE lab session begins)

10 points: Credible answers to Preliminary Questions (depending on lab design or TA preference, this may either be through turning in a preliminary question sheet at end of the lab session, or through the TA signing off on the completed lab handout at the end of class.

50 points: Lab Report (due 1 week after lab)

1 day to 1 week late - 25% deduction

1 to 2 weeks late - 50% deduction

More than 2 weeks late - 100% deduction

Activities (A, B, ..)

40 points (maximum) total per Activity

10 points for the Pre-Activity exercise (must be completed and turned in BEFORE session begins) Not all activities will have a Pre-Activity sheet.

10 points for participation (being part of the discussions, being active in the activity, etc). This may also be documented via handouts during the activity.

20 points: Activity Report (usually due 1 week although it also may be due at end of the lab)

1 day to 1 week late - 25% deduction

1 to 2 weeks late - 50% deduction

More than 2 weeks late - 100% deduction

The lowest Laboratory score will be dropped from the final tally of Laboratory scores for the student.

Note that if a student has less than 50% of the total points possible for the laboratories alone, it will be an F despite having additional points due to activities participation.

Final grade is calculated from percentage of total points as follows

100 – 88% A: 87 - 84% A-: 83 – 79% B+: 78 – 75% B: 74 – 71% B-: 70 – 66% C+: 65 – 62% C: 61 – 50% D: <49% F

D. Detailed outline and order of sections of the Lab Report

(Note the sections marked * should have a labeled section heading in the report.)

- 1) **Identification Section (Name block)** (Missing any of these 4 items will result in a deduction of 5 points!)
 - a) Your name and Zid
 - b) Date (the date when you did the lab, include month, day, year)
 - c) Names of all your lab partners (correct spelling of first and last names required)
 - d) Lab section ID (e.g. "A, 9:00 AM Monday", etc.)
- 2) **Title** (Missing a title will be a deduction of 5 points!)
 - a) Name of the Lab Experiment
 - b) You may use the title as given in the lab handout or you may be creative as long as your title describes the lab accurately and helps distinguish it from the other reports
- 3) **[10 points] *Theory and/or Background** << needs section label
 - a) State in your own words(!) the connection between the lab activities and the physics concepts that are being explored.
 - b) State in your own words(!) the physics theory, and formulas that are explored in this lab.
 - c) Comment on how the results of your experiment compare to the expected objective of the lab or matched the theory.
 - d) One paragraph is sufficient.
- 4) **[5 points] *Equipment and Methods** << needs section label
 - a) An unobstructed photograph(s) or schematic drawing of the apparatus or tools that are used in the experiment, and
 - b) A Photograph of yourself and your lab partners in front of the lab apparatus (caption with names).
- 5) **[15 points] *Results** << needs section label
 - a) The lab handout section "Data Observations" gives guidance in tables and graphs that will be required for any particular laboratory.
 - b) Data Tables must have a
 - i. Descriptive title (what is the table about?)
 - ii. Columns/rows labeled (e.g., and appropriate units given (meters, seconds, etc.).
 - iii. Use Excel to produce all graphs - Graphs must have
 - c) Descriptive title (what is this graph about?)
 - i. Labels and units on the axes
 - ii. In the text or in the caption of graphs and tables, please show and describe all equations that are used to produce the tables and graphs.
- 6) **[20 points] *Discussion** << needs section label
 - a) The lab handout section "Observations" (at end of lab handout) has a set of numbered questions for discussion.
 - i. Answer each question listed in the section labeled "Observations". Be sure to include your justifications in your answer.
 - ii. Each answer should be a paragraph in length, and each paragraph numbered to match the questions in the lab manual for the experiment.
 - iii. Failure to write complete paragraphs with a justification for your answer will result in point deductions.
 - iv. Each question that is skipped will result in point deductions

E. Lab Policies include:

- 1) Be respectful of each other (this applies to Instructors, TA's and students). Some specifics include:
 - a) Follow the TAs instructions and the equipment setup described in the Lab Experimental document.
 - i. TAs can deduct points if students carelessly break lab equipment, don't follow instructions or are disruptive.
 - ii. TA's can assign and change seat and partner assignments to facilitate lab management.
 - b) Use of cell phones/ tablets/ computers during lab is limited to lab related activities (such as taking photographs of the experimental setup and emailing it to lab partners, writing drafts of the report.
- 2) Lab partners and working together: 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.
 - a) However, you should record your own data, and the lab reports that you turn in must be your own work in your own words.
 - b) 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 for potential sanctions.
- 3) 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.
- 4) 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.
- 5) For an event that knocks the stuffing out of a student during the semester (for example; death in immediate family, sudden change in health of child/parent/sibling/significant other for whom they are primary caregiver, an emotional/physical traumatizing event, or serious health issue arising) please contact instructor as soon as practical so we can figure out and implement an accommodation of the situation. Don't tough it out and don't ghost the course.

F. Schedule of labs and class meetings: Phys 151 Spring 2018

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WEEK #	(Phys 151 Laboratory 10 Hands-on Laboratory Modules (#1, ...) 2 Supporting Laboratory Modules (#A, #B, #C) 1 Laboratory Enrichment Modules (# α)	Pre-lab assignments noted	Phys 150 Lecture Topics Hewitt textbook (<i>Conceptual Physics</i>) is designed for a 2 semester course, so we will only be covering selected sections.
Week 1	MLK Holiday (Monday)		Chapter 2 through 5. Newton's three laws of motion
Week 2	Activity #A Orientation & Graphing, problem solving (also Assessment pre-Testing (Force Inventory Concepts))	No pre-activity	Chapter 2 through 5. Newton's three laws of motion
Week 3	Lab #1 Motion & Push/ Pull Forces	Pre-lab #1	Chapter 6 and 7. Momentum, work, energy, and power
Week 4	Activity #B Lab report writing orientation (Lab #1 used to demonstrate)	Pre-activity B	Chapter 6 and 7. Momentum, work, energy, and power
Week 5	Lab #2 Velocity, Acceleration, 2d Motion	Pre-lab #2	Chapters 15, 16 and 18. Temperature, heat, and first 2 laws of thermodynamics
Week 6	Lab #3 Newton's 3rd Law	Pre-lab #3	Chapters 15, 16 and 18. Temperature, heat, and first 2 laws of thermodynamics
Week 7	Lab #4 Friction	Pre-lab #4	Chapters 22-25. Electricity, magnetism, light waves, radio waves, microwaves, and electricity generation
Week 8	Lab #5 Specific Heat	Pre-lab #5	Chapters 22-25. Electricity, magnetism, light waves, radio waves, microwaves, and electricity generation
Week 9	SPRING BREAK		SPRING BREAK March 9- 13, 2017
Week 10	Lab #6 Static Electricity / Coulomb's Law	Pre-lab #6	Chapters 22-25. Electricity, magnetism, light waves, radio waves, microwaves, and electricity generation
Week 11	Lab #7 Ohm's Law	Pre-lab #7	Chapter 26,28-29. Properties of light, reflection and refraction, light waves
Week 12	Lab #8 Simple Harmonic Motion (springs) & Energy	Pre-lab #8	Chapter 26,28-29. Properties of light, reflection and refraction, light waves
Week 13	Lab #9 Reflection, Refraction, Dispersion	Pre-lab #9	Chapter 30. Light emission from sun, tungsten bulbs, lasers and LEDs
Week 14	Lab #10 TBD	Pre-lab #10	Chapters 33 and 34. Theory of the atom, nuclear energy, and electrical power generation
Week 15	Lab #11 TBD	Pre-lab #11	Chapters 33 and 34. Theory of the atom, nuclear energy, and electrical power generation
Week 16 (Spring)	Activity Alpha - Q and A with Physics Graduate students presenting on their research. (also - Assessment post-Testing (Force Inventory Concepts))	Pre-Activity C	Chapters 33 and 34. Theory of the atom, nuclear energy, and electrical power generation
Finals	No labs meet during Finals week		Phys 150 Final Exam