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Spring 2-1-2018

### PHSX 218N.00: Physics Lab II w/Calculus

Jaylene R. Naylor

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# Physics 218: Physics Laboratory II with Calculus Spring 2017

## Course Information

- Instructor Name: Jaylene Naylor
- Office: CHCB 228
- Email: [jaylene.naylor@umontana.edu](mailto:jaylene.naylor@umontana.edu)
- Lab: Wednesday or Thursday 3:10-5:00pm in CHCB 229
- Office Hours: M 11a-12p, T 2-3p. Please feel free to make an appointment for other times!
- Website: [Moodle](https://moodle.umonline.umt.edu) umonline.umt.edu

## Overview

The goal of this class is to give you a sound introduction to classical experimental physics. This will include studying some basic concepts in physics, development of problem solving skills, laboratory techniques and some basic programming skills for data analysis. It is essential that you keep up from the start as the concepts in this course build on each other. Co-requisite to this course is PHSX 217.

## Learning Objectives

The goals of this course are:

- To learn how to properly take measurements and record data.
- To learn how to interpret results both statistically and graphically.
- To experimentally confirm theories presented in lecture.

## Laboratory

There will be 12 two-hour labs during the semester. You will be required to attend the labs, take measurements, and then write up a full report or take a quiz/turn in brief writeup for each lab. *Each student must hand in their own lab report written in their own words (no duplicates!)* Two of the eleven labs will require a lab report. The remainder of your lab work will be assessed with Moodle quizzes and brief writeups. **Quizzes are to be done individually.**

**IMPORTANT:** New this semester: The 2 full write-ups will now be worth 25% of your grade. The remaining 10 quiz/short write-ups will be worth 65%, and prelabs will be worth 10%. We will drop the lowest score of the 10 quiz/short write-ups and the lowest prelab score. **NEITHER of the scores from the 2 full write-ups will be dropped.** If you miss one of them, you will need to work with me to select another lab for which to do a full write-up. PLEASE avoid this if at all possible!

Each week, a few days before your lab, you should read the current lab. Students are expected to have read the instructions prior to arriving at the lab, and will be asked to take a brief pre-lab quiz on Moodle.

There will be no make-up labs. If you will miss your lab, contact your instructor *ahead of time* about attending another section that week. Labs are held Wednesday and Thursday 3:10-5:00pm

## Lab Report and Quiz due dates

- Pre Lab Quizzes: On Moodle, open on Friday at 8am and close at 11:59pm the day before your lab section. 60 minutes allowed to take quiz.

- Lab Quizzes: On Moodle, open on Friday at 8am and close on Monday at 11:59pm for all sections. 30 minutes allowed to take quiz.
- Lab Reports: Due at beginning of the following lab meeting.
- Late Penalties for Lab Reports: Late lab reports will be penalized 10% per day late, excluding holidays and weekends. Labs will not be accepted more than one week after their due date.

## Course Guidelines and Policies

### Student Conduct Code

The Student Conduct Code at the University of Montana embodies and promotes honesty, integrity, accountability, rights, and responsibilities associated with constructive citizenship in our academic community. This Code describes expected standards of behavior for all students, including academic conduct and general conduct, and it outlines students' rights, responsibilities, and the campus processes for adjudicating alleged violations. [Full student conduct code.](http://www.umt.edu/vpsa/policies/student_conduct.php)  
[http://www.umt.edu/vpsa/policies/student\\_conduct.php](http://www.umt.edu/vpsa/policies/student_conduct.php)

### Course Withdrawal

Students may use Cyberbear to drop courses through the first 15 instructional days of the semester. Beginning the 16<sup>th</sup> instructional day of the semester through the 45<sup>th</sup> instructional day, students use paper forms to drop, add and make changes of section, grading option or credit. PHSX 218 may not be taken as credit/no-credit.

### Disability Modifications

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and [Disability Services for Students](https://www.umt.edu/dss/default.php).  
<https://www.umt.edu/dss/default.php> If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or call 406.243.2243. I will happily work with you and Disability Services to provide an appropriate modification. Please feel welcome to come talk to me about any concerns you may have.

### Grading Policy

Generally, final letter grades fall within these ranges:

A or A- = 90-100%. B+, B, or B- = 80-89%. C+, C or C- = 70-79%. D+, D or D- = 60-69%. F = 59% or less.

Your grade will be based on the following:

Pre-Lab quizzes: 10% (drop lowest score)

Lab quizzes and short write-ups: 65% (drop lowest score)

Full write-ups (2): 25%

## Lab Schedule

Date	Lab	Due
<b>Week 1: Jan 23 – 27</b>	Review and More Python	
<b>Week 2: Jan 30 – Feb 3</b>	Thermal Expansion – FULL WRITE-UP	Quiz: Review and More Python Pre-lab Quiz: Thermal Expansion
<b>Week 3: Feb 6 – 10</b>	Mechanical Equivalent of Heat	Full Report Due: Thermal Expansion Pre-lab Quiz: Mech Eq of Heat
<b>Week 4: Feb 13 – 17</b>	NO LAB THIS WEEK Exam 1 for lecture course	
<b>Week 5: Feb 20 – 24</b>	Electric Fields	Quiz and Write-up Due: Mech. Equivalent of Heat Pre-lab Quiz: Electric Fields
<b>Week 6: Feb 27 – Mar 3</b>	Raspberry Pi Part 2	Quiz and Write-up Due: Electric Fields Pre-lab Quiz: Raspberry Pi Part 2
<b>Week 7: Mar 6 – 10</b>	Ohm's Law and Simple Circuits	Quiz Due: Raspberry Pi Part 2 Pre-lab Quiz: Ohm's Law
<b>Week 8: Mar 13 – 17</b>	Slow and Fast RC Circuits Exam 2 for lecture course	Quiz and Write-up Due: Ohm's Law and Simple Circuits Pre-lab Quiz: Slow and Fast RC Circuits
<b>Week 9: Mar 20 – 24</b>	NO LAB – SPRING BREAK	
<b>Week 10: Mar 27 – Mar 31</b>	Ampere's Law – FULL WRITE-UP	Quiz and Write-up Due: Slow and Fast RC Pre-lab Quiz: Ampere's Law
<b>Week 11: Apr 3 – 7</b>	NO LAB	
<b>Week 12: Apr 10 – 14</b>	Magnetic Field Mapping Exam 3 for lecture course	Full Write-up Due: Ampere's Law Pre-lab Quiz: Mag Field Mapping
<b>Week 13: Apr 17 – 21</b>	Lenses	Quiz and Write-up Due: Mag Field Mapping Pre-lab Quiz: Lenses
<b>Week 14: Apr 24 – 28</b>	Index of Refraction	Quiz and Write-up Due: Lenses Pre-lab Quiz: Index of Refraction
<b>Week 15: May 1 – 5</b>	Interference and Diffraction Exam 4 for lecture course	Quiz and Write-up Due: Index of Refraction Pre-lab Quiz: Int and Diff
<b>Week 16: May 8 – 12</b>	NO LAB – FINALS WEEK	Quiz Due: Interference and Diffraction