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PHSX 218N.01: Physics Laboratory II with Calculus

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Physics 218: Physics Laboratory II with Calculus Spring 2022

Course Information

- Instructor Name: Jaylene Naylor
- Office: CHCB 228
- Email: jaylene.naylor@umontana.edu
- Lab: Wednesday or Thursday 3:00-4:50pm. Links in Moodle
- Office Hours: T 2p-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 for each lab. **Each student must hand in their own lab report written in their own words (no duplicates!)** Two of the twelve labs will require a lab report. The remainder of your lab work will be assessed with in class quizzes. **Quizzes are to be done individually.**

IMPORTANT: The 2 full write-ups will be worth 25% of your grade. The remaining 10 quizzes will be worth 65%, and prelab quizzes will be worth 10%. We will drop the lowest score of the 10 quizzes 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 3:00-4:50pm

Lab Report and Quiz due dates

- Pre Lab Quizzes: On Moodle, open immediately after your lab section and close at 3 pm the day of your lab section. 60 minutes allowed to take quiz.

- Lab Quizzes: Opens immediately after your lab section and closes at 3 pm the day of your next lab section. 20 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

Course Withdrawal

Students may use Cyberbear to drop courses through the first 15 instructional days of the semester. Beginning the 16th instructional day of the semester through the 45th 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
Week 1: Jan 17 – 21	No Lab	
Week 2: Jan 24 – 28	Mechanical Equivalent of Heat	Pre-lab Quiz: Mechanical Eq
Week 3: Jan 31 – Feb 4	Electric Fields	Quiz: Mech Eq of Heat Pre-lab Quiz: Electric Fields
Week 4: Feb 7 – 11	NO LAB THIS WEEK	
Week 5: Feb 14 – 18	Raspberry Pi + Intro to breadboards	Quiz: Electric Fields Pre-lab Quiz: Intro to Breadboards
Week 6: Feb 21 – 25	Ohm's Law	Quiz: Breadboards Pre-lab Quiz: Ohm's Law
Week 7: Feb 28 – Mar 4	Slow RC FULL WRITE-UP	Quiz: Ohm's Law Pre-lab Quiz: Slow RC Circuits
Week 8: Mar 7 – 11	Fast RC	WRITE-UP Due: Slow RC Circuits Pre-lab Quiz: Fast RC Circuits
Week 9: Mar 14 – 18	Earth's Magnetic Field	Pre-Lab Quiz: Earth's Mag Field Quiz: Fast RC Circuits
Week 10: Mar 21 – 25	NO LAB – Spring Break	
Week 11: Mar 28 – Apr 1	NO LAB	Quiz: Earth's Mag Field We'll do this quiz on Moodle
Week 12: Apr 4 – 8	NO LAB	
Week 13: Apr 11 – 15	Lenses	Pre-Lab Quiz: Lenses
Week 14: Apr 18 – 22	Index of Refraction (with water tanks) FULL WRITE-UP	Pre-lab Quiz: Index of Refraction Quiz: Lenses
Week 15: Apr 25 – 29	Interference and Diffraction	FULL WRITE-UP DUE Refraction Pre-lab Quiz: Int and Diff
Week 16: May 2 – 6	Spectrum Analysis	Pre-lab Quiz: Spectrum Analysis Quiz: Interference and Diffraction Quiz: Spectrum Analysis