Physics 216: Physics Laboratory I with Calculus Fall 2019

Course Information

- Instructor Name: Jaylene Naylor
- Office: CHCB 228
- Email: jaylene.naylor@umontana.edu
- Lab: Tuesday 3:00-4:50pm in CHCB 229
- Office Hours: M 11:00a-12:00p, Thurs 2:00p-3:00p. Please feel free to email me and make an appointment for other times. I'm around a lot of the time!
- Website: Moodle 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, learning of 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 215.

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 11 two-hour labs during the semester. Ten of those labs will count towards your final grade. You will be required to attend the labs, take measurements, and then write up a report and take a quiz for each lab. Each student must hand in their own lab report written in their own words. If you miss a lab, you may not attempt the quiz.

IMPORTANT: The two full write-ups will be worth 25% of your grade. The remaining 9 quizzes will be worth 65% and prelabs will be worth 10%. We will drop the lowest score of the 9 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!

In preparation for the course, you should go to the course Moodle page to download the document, "Treatment of Data", which explains how to handle error analysis, graphing, and other key issues that come up while writing labs. 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 Mon, Tues, Wed 3:00-4:50pm.

Lab Report and Quiz Due Dates

- Pre Lab Quizzes: On Moodle, open on Thursday at 8am and close at 11:59pm the day before your lab section. 60 minutes allowed to take quiz.
- Lab Quizzes: Taken at beginning of lab. Generally given 15 minutes 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

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 216 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 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 work with you and Disability Services to provide an appropriate modification.

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%
Lab quizzes: 65%
Full Lab Reports (2): 25%

Lab Schedule

Date	Lab	Assessment	Lecture topics
Week 1: Aug 26 – Sept 1	Introduction to Error Analysis		1-D Kinematics
Week 2: Sept 2 – 8	Measuring g & Intro to Python	Pre-lab quiz Error quiz	Vectors
Week 3: Sept 9 – 15	Projectile Motion	Pre-lab quiz Measure g quiz	Projectiles
Week 4: Sept 16 – 22	NO LAB (Exam 1 in lecture)		Force & Motion
Week 5: Sept 23 – 29	Force Tables	Pre-lab quiz Projectiles quiz	Force & Motion
Week 6: Sept 30 – Oct 6	Ballistic Pendulum FULL LAB REPORT	Pre-lab quiz Force Table quiz	Kinetic Energy & Work
Week 7: Oct 7 – 13	Collisions	Pre-lab quiz Lab Report Due	Cons. of Energy Collisions
Week 8: Oct 14 – 20	Circular Motion	Pre-lab quiz Collisions quiz	Linear Momentum Rotation
Week 9: Oct 21 – 27	Python Functions with Drones		Torque
Week 10: Oct 28 – Nov 3	Moment of Inertia FULL LAB REPORT	Pre-lab quiz Python quiz	Angular Mom.
Week 11: Nov 4 – 10	NO LAB (Exam 3 in lecture)		Equilibrium Gravitation
Week 12: Nov 11 – 17	Archimedes' Principle	Pre-lab quiz Lab Report Due	Fluids
Week 13: Nov 18 – 24	Hooke's Law	Pre-lab quiz Arch. quiz	Oscillations
Week 14: Nov 25 – Dec 1	NO LAB - Thanksgiving		Oscillations & Waves
Week 15: Dec 2 – 8	Waves on a String	Pre-lab quiz Hooke's quiz String quiz	Waves Final Review
Week 16: Dec 9 – 13	NO LAB, Finals week		Final