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INSTRUCTOR:	Dr. Alex Bulmahn
OFFICE:	226 CHCB (inside of room 225)
EMAIL:	alexander.bulmahn@umontana.edu
LAB:	M 1-2:50 <i>or</i> 3-4:50, Charles H. Clapp Building 225
OFFICE HOURS:	T 11-1, W 12:30-1:30, R 11-1, and by appointment
COURSE WEBSITE:	Grades and lab materials will be posted on the Moodle site for this course
COREQUISITE:	PHSX 207N

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## Overview

The goal of the laboratory is to both aid students in quantitative laboratory techniques and their conceptual understanding of physics. The material covered will be commensurate with the lecture course with which the lab is paired. The quantitative laboratory techniques will include reading an array of measuring instruments, handling of error that results from the measuring instruments, understanding the distinction between precision and accuracy, and proper display and analysis of data. It is essential that you keep up from the start as the concepts in this course build on each other.

## Learning Objectives

The goals of this course are:

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

## Required Materials

You will need the following materials for the course:

- Laboratory notebook
- Scientific calculator and pencil
- Weekly labs (downloaded from Moodle)
- Flash Drive to save data

## Laboratory

There will be 11 two hour labs during the semester. 10 of these labs will count toward your final grade. The reason for offering 11 labs, but only counting 10 is so students may miss one lab (unplanned absence, emergency) without consequence. **You are required to attend the labs, take measurements, and keep a notebook for each lab. There will be no opportunity for make-up labs.**

Each week, a few days before lab, you should download and print a copy of the current lab, read it, and bring it with you to lab. You are expected to have read the lab instructions prior to arriving at the lab and to have completed the associated pre-lab quiz. **Pre-lab quizzes will be taken on Moodle and close at noon the Monday of lab.** Before performing the next experiment, you will be given an open notebook quiz over the previous week's lab. Approximately 15 minutes will be allotted for completing lab quizzes.

The experiments are designed to take approximately two hours for measurements and an additional one to two hours needed outside of lab for data analysis as well as preparation for the next lab. This is consistent with the time expectations for a one credit course.

## Grading

Your grade for the course will be determined by a combination of pre and post lab quizzes. **There will be no make-up labs so attendance is mandatory.** The grading for the course will be broken down as follows:

Pre-Lab Quizzes:	15%
Post-Lab Quizzes:	85%

This course can only be taken with the traditional grading option. Plan on letter grades being assigned based on the traditional grading curve: 100-90% A, 89-80% B, etc. *Note: the last day to drop the course via Cyberbear is September 16<sup>th</sup>. The last day to drop the course without the Dean's signature is October 28<sup>th</sup>.*

## 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/student-affairs/dean-of-students/default.php) (<http://www.umt.edu/student-affairs/dean-of-students/default.php>)

## 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.

## Schedule

Week	Date	Lab
<b>1</b>	8/26	<b>NO LAB</b>
<b>2</b>	9/2	<b>Labor Day—NO LAB</b>
<b>3</b>	9/9	Electric Field and Potential
<b>4</b>	9/16	Ohm's Law and Simple Electric Connections
<b>5</b>	9/23	Slow RC Circuits
<b>6</b>	9/30	Fast RC Circuits
<b>7</b>	10/7	TBA
<b>8</b>	10/14	Earth's Magnetic Field
<b>9</b>	10/21	<b>NO LAB</b>
<b>10</b>	10/28	Lenses and Images
<b>11</b>	11/4	Wavelength of Light
<b>12</b>	11/11	<b>Veteran's Day—NO LAB</b>
<b>13</b>	11/18	Interference and Diffraction
<b>14</b>	11/25	Determining Planck's Constant
<b>15</b>	12/2	Spectrum Analysis
<b>16</b>	12/9	<b>Finals Week—NO LAB</b>