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PHSX 217N.01: Fundamentals of Physics with Calculus II

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PHSX 217N: Fundamentals of Physics w/ Calc II Spring 2018

PROFESSOR:	Dr. Alex Bulmahn
OFFICE:	226 CHCB (inside of room 225)
EMAIL:	alexander.bulmahn@umontana.edu
LECTURE:	MTWR 1-1:50 pm, Charles H. Clapp Building 131
OFFICE HOURS:	TWR 11-12, and by appointment
TEXTBOOK:	<i>Fundamentals of Physics, 10th Edition</i> with WileyPlus Access Halliday and Resnick
PREREQUISITES:	PHSX 215N, M 171
COREQUISITE:	PHSX 218N, M 172

Overview

The goal of this course is to give you a sound introduction to waves and sound, thermodynamics, electricity and magnetism, and optics. This will include studying basic concepts in physics and development of problem solving skills. It is essential that you keep up with the material from the start as the concepts presented in this course build on each other.

Learning Objectives

This course is designed to enable the student to:

- demonstrate a comprehension of the physical world by understanding how fundamental physical principles underlie the huge variety of natural phenomena and their interconnectedness.
- build critical thinking and quantitative skills by gaining insight into the thought processes of physical approximation and physical modeling, and by practicing the appropriate application of mathematics and calculus to the description of physical reality.
- comprehend the physical interpretation of mathematical results.

Grading

Your grade for the course will be based on weekly homework assignments, three midterm exams, and a final exam. **Late homework will not be accepted and make up exams will only be given in extreme circumstances.** The grading for the course will be broken down as follows:

Homework:	30%
Midterm Exams:	15% each (45% total)
Final Exam:	25%

This course can only be taken with the traditional grading option. The letter grades in this course will be based on a curve, giving you the grade that you earn. The curve will be determined by the performance of the class as a whole, but I do not have a set number of A's, B's, etc. predetermined. *Note: the last day to add or drop the course via Cyberbear is February 9th. The last day to drop the course without the Dean's signature is April 2nd.*

Homework

Homework will be assigned weekly on the WileyPlus online system. The website can be found [here](https://www.wileyplus.com). (<https://www.wileyplus.com>). The course ID for this class is 628076.

Exams

Exams will be given periodically on Monday evenings from 5-7 pm and will be held in room 131 CHCB. Exams will be closed book, but students will be allowed one 3 x 5 index card of **handwritten** notes and a calculator. See the schedule for the exam dates.

Expectations

This is a university science course and it will be taught at that level. The use of mathematics will be necessary for understanding the topics that we will cover, like it is in any science course. The mathematics we will use in this course are algebra, geometry, trigonometry, and calculus and it is imperative that you are comfortable with these to be successful in this course.

Attendance, while not mandatory, is *highly recommended*. Homework assignments and exams will be based on material that is presented in lecture.

To be successful in this class, time will need to be spent outside of lecture reviewing information from the course. It is recommended that you keep up with the reading assignments that are posted on the schedule to gain a better understanding of the concepts being presented in lecture. Weekly homework assignments also make up a large portion of your overall grade. These assignments will usually take 3-5 hours to complete so don't wait until the last minute to start your homework. Remember that at the UM, one "unit" represents 3 hours of work by the student including class time. Being a four unit course, you can expect to put around 12 hours per week into the course to be successful.

Course Etiquette

In order to keep the environment conducive for learning please:

- arrive on time. Lectures will begin promptly at 1:00.
- do not start packing your things early as this can be very distracting to your fellow students. I will not keep you late and lectures will end by 1:50.
- keep cell phones set to vibrate, silent, or off and keep them put away throughout the lecture. I promise that you will get more out of the course if you do not spend lecture time texting and updating your facebook page.

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)

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

Tentative Schedule

Week	Dates	Topic	Reading and Notes
1	1/22—26	Waves, Sound	Ch. 16, Ch. 17
2	1/29—2/2	Temperature, Heat & Work	Ch. 18
3	2/5—9	Ideal Gas and Kinetic Theory	Ch. 19
4	2/12—16	Entropy and the 2 nd Law of Thermodynamics Electric Force	Ch. 20 Ch. 21
5	2/19—23	Electric Field and Flux, Gauss' Law Midterm Exam #1, Tuesday 2/20 5-7 pm	Ch. 22, Ch. 23
6	2/26—3/2	Electric Potential, Capacitance	Ch. 24, Ch. 25
7	3/5—9	Capacitors, Electric Current and Resistance	Ch. 25, Ch. 26
8	3/12—16	Electric Power, Simple Circuits	Ch. 26, Ch. 27
9	3/19—23	Magnetic Field, Magnetic Force Midterm Exam #2, Monday 3/19 5-7 pm	Ch. 28, Ch. 29
10	3/26—30	SPRING BREAK	Relax and Recharge
11	4/2—6	Faraday's Law, Lenz's Law	Ch. 29, Ch. 30
12	4/9—13	Circuits, AC Current, Transformers	Ch. 30, Ch. 31
13	4/16—20	EM Spectrum, EM Waves, Reflection and Refraction Midterm Exam #3, Monday 4/16 5-7 pm	Ch. 32, Ch. 33
14	4/23—27	Image Formation, Interference	Ch. 34, Ch. 35
15	4/30—5/4	Thin Slit Interference, Diffraction	Ch. 35, Ch. 36
16	5/7—11	Finals Week Final Exam 3:20-5:20, Tuesday 5/8	Exam in 131 CHCB