Instructor Information

Course Instructor: Dr. Katrina Black
Office: Dept. of Physics, Fisher 114
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Zoom Office Hours: Mondays 6-7 PM and Thursdays 2-3 PM Eastern Daylight Time, or email for appointment. See Canvas Home Page for Zoom link.

Materials

1. Required Text: College Physics, OpenStax College Publishing, ISBN 978-1-93816-00-0, available as a FREE PDF. Non-free print copies are also available.
2. WebAssign for online homework is made available via Inclusive Access.
3. Calculator. A scientific calculator is sufficient for the course, but I recommend a graphing calculator for ease of entering more complicated calculations.
4. High-speed internet sufficient for streaming video, accessing course materials, etc. Most students will want access every weekday.
5. Webcam or phone with camera for video proctoring of exams.

Course Overview

In PH1210, we will explore topics in electricity and magnetism, circuits, geometric and physical optics, wave-particle duality, atomic and nuclear structure, radioactivity, and special relativity Using algebra-based math, conceptual reasoning, and graphical analysis, we will develop models that describe the way the world works and use those models to describe and predict events.

By the end of this course, successful students should be able to:

1. Appropriately use physics vocabulary.
2. Identify which model to use to solve a problem and create solutions in electrostatics, simple DC, RC, and RL circuits, geometric and physical optics, and modern physics.
3. Recognize appropriate values, measurement limitations, and units for physical quantities.

Vital Course Information

1. **Time Commitment:** This summer course is very intense – we cover a semester's worth of physics in only 7 weeks. Expect to spend around 20 hours per week on this course. Many students find it takes even more time during more difficult material.
2. **Ask for help when you need it:** In an online course, it's up to you to seek help when you need it. Unlike in a synchronous environment, I can't see when you look confused! It's my job to help you learn this material, so please don't hesitate to be in touch with me and your classmates early and often.
3. **Not Entirely Self-Paced:** Assignments will be due each weekday and exams are scheduled for specific days. Each week's material will open on the prior Thursday and you are welcome to work ahead to accommodate your schedule.
4. **Exams Proctored via Zoom:** A TA or I will proctor your exams via Zoom - as each exam approaches, we will determine mutually agreeable time slot(s) as a class.

Grading Policy

Your final grade will be determined using the following weights:

Assignment Group	Percentage
Discussion Participation	5%
Daily Quizzes	20%
WebAssign Homework	25%
Midterm Exams	30% (15% each)
Final Exam	20%

Letter grades will be assigned as follows, rounding to the nearest percent:

Grade	Range
A	90-100%
AB	85-89%
B	80-84%
BC	75-79%
C	70-74%
CD	65-69%
D	60-64%
F	0-59%

I reserve the right to adjust these ranges downward, but will not adjust them upward.

Course Components and Work Schedule

Our work weeks will start on Tuesdays. Each Tuesday through Friday introduces new material, broken into two parts (a and b). Mondays are set aside to review and wrap up WebAssign homework. As you work through each weekly Module, you will find four types of assignments associated with each day of new material.

- Work through the *Reading, Video, and Activities (RVA)* pages
- Take the *Daily Quizzes*
- Begin (and eventually finish) the *WebAssign Homework*
- *Reflect* on your learning

Reading, Video, and Activities (RVA) pages: These pages connect you to the associated parts of your textbook and contain a variety of materials to help you apply what you have read, including explanatory videos, online activities and simulations, and skill-building practice quizzes.

Daily Quizzes: Daily quizzes check that you understood the fundamental ideas from each RVA page and give you practice in the ideas you will use in the homework. If you have trouble with the quizzes, you will want to review the reading, video, and activities, or ask for help in our class discussion - you have ten tries to get these questions right! One quiz will be dropped to allow for any technical issues.

Try the Homework: I recommend looking over the WebAssign homework immediately after completing the day's RVA and Quizzes, but you don't have to finish the problems then! Instead, think about how you might solve each problem based on what you have just learned. Make a plan and start work on each problem. You have five attempts for each problem. Asking for (and giving) help in the Discussion can count toward your *Reflect* grade.

Finish the homework: Homework for each day's new material is due at the end of the week (Mondays at 11:59 pm), except for the last week of class. Your lowest homework grade will be dropped to allow for any technical issues.

Reflect on your learning: There will be several Discussions available through the course. Daily Discussions invite you to reflect on that day's new material and how it connects to what you have already learned. Weekly Wrap-Up Discussions allow collaboration on homework problems. Because there are 24 days of new material, I expect that each student contributes at least 24 times over the course. One way to do this is to post to each Daily Discussion, but can also earn points by asking and answering questions in the Weekly and Exam Discussions. You can earn extra credit in the portion of the course, up to a total of 36/24, or 150%.

Your own personal schedule will dictate the most appropriate timing to work on the course components, keeping in mind that daily quizzes are due at 11:59 each day and each week's WebAssign is due at 11:59 pm on Mondays. I suggest allowing something like 30 – 60 minutes to read, 60 – 90 minutes to watch the videos, do activities, and take the daily quizzes, 30 – 60 minutes to begin the homework, and 2 hours to finish the homework.

Late Work and Extensions

I know everyone is busy, especially during a compressed summer class! Canvas will automatically apply a 12-hour grace period for every assignment. In WebAssign, you must apply for an "automatic extension", which will expire in 12 hours or 1 day after the due date, whichever comes first. After the grace period/extension, the assignments will lock and late work will only be accepted for reasons consist with the Dean of Students' excused absence policy. *Please use the grace period responsibly and only when needed so that I can continue to offer it.*

Exams

This course has two midterms and one final exam. The scheduled dates are:

- Midterm 1: Tuesday, July 8 (Covering the material from Weeks 1 and 2)
- Midterm 2: Tuesday, July 22 (Covering the material from Weeks 3 and 4)
- Final: Friday, August 8 (Comprehensive with a focus on the material from Weeks 5, 6, and 7)

Exams for this course are hybrid computer/paper exams. The exams will be presented online, but some questions will require written work to be uploaded via photograph or scan.

Please allow 90 minutes for your midterm exams and 120 minutes for your final exam.

Exams are open book/open notes/open course. You may use the resources available in the Canvas course, but you may not use the open internet to look up how to do a problem. Calculators are allowed. I (or a TA) will proctor your exams via Zoom. Exams will only be available during specific

time slots the day of the exam, which will be mutually determined based on instructor and student availability.

Academic Integrity

I have a liberal policy toward students working together to solve homework problems. Just as physicists work together to do physics, physics students should work together to understand homework problems! You can work together in person, or ask and answer questions in Discussions threads. HOWEVER, do not short-change yourself by using another student's work to answer quizzes and homework questions. Not only is this a breach of academic integrity, but doing homework is like practicing for a recital or training for a marathon. You may find a way to cut corners, but your exam grades will show it!

Of course, during an exam, any communication with any other person, or use of any unauthorized resources is considered cheating.

If academic dishonesty is suspected, the matter will be referred to the Office of Student Affairs. The penalty is no less than an academic integrity warning and no more than expulsion.

University Policies

Student work products (exams, essays, projects, etc.) may be used for purposes of university, program, or course assessment. All work used for assessment purposes will not include any individual student identification.

Michigan Tech has standard policies on academic misconduct and complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990. For more information about reasonable accommodation for or equal access to education or services at Michigan Tech, please contact the Dean of Students Office at (906) 487- 2212, email deanofstudents@mtu.edu, or view the policies here.

If you require disability accommodation for any reason, please don't hesitate to contact me or the Dean of Students for guidance. Visiting students should be aware that according to Michigan Tech University guidelines, disability accommodations should be verified through the Dean of Students.

Tentative Schedule

Week	Day	Date	Reading	Topic
0	Mon	23-Jun		Course Introduction
1	Tue	24-Jun	18.1-18.3	Charge, Conductors, Insulators, Coulomb's Law
	Wed	25-Jun	18.4-18.7	Electric Fields
	Thu	26-Jun	19.1-19.4	Electric Potential and Potential Energy
	Fri	27-Jun	20.1-20.2	Current, Resistance, Ohm's Law
	Mon	30-Jun		Week 1 HW due
2	Tue	1-Jul	21.1, 21.3	Series and Parallel Circuits; Kirchhoff's Rules
	Wed	2-Jul	21.4, 20.4	More complicated circuits, Voltmeters/Ammeters, Power
	Thu	3-Jul		Independence Day Recess
	Fri	4-Jul	19.5-19.7, 21.6	Capacitors and RC circuits
	Mon	7-Jul		Week 2 HW due
3	Tue	8-Jul		Midterm Exam 1
	Wed	9-Jul	22.1-22.3; 22.9	Creating Magnetic Fields
	Thu	10-Jul	22.5-22.7; 22.10	Experiencing Magnetic Fields
	Fri	11-Jul	23.1-23.4	Induced Magnetic Fields
	Mon	14-Jul		Week 3 HW Due
4	Tue	15-Jul	23.5-23.10, 20.5	Inductance and RL Circuits, AC Current and Voltage
	Wed	16-Jul	24.1-4; 25.1-4	Reflection and Refraction of Light
	Thu	17-Jul	25.6-25.7	Curved Mirrors/Lenses
	Fri	18-Jul	26.1-26.2	Physics of the Eye/Vision Correction
	Mon	21-Jul		Week 4 HW Due
5	Tue	22-Jul		Midterm Exam 2
	Wed	23-Jul	27.1-27.3	Interference, Diffraction, Double Slit Experiment
	Thu	24-Jul	29.1-29.5	Particle Nature of Light
	Fri	25-Jul	29.6-29.8	Wave Nature of Matter
	Mon	26-Jul	29.1-29.5	Week 5 HW Due
6	Tue	29-Jul	30.1-30.3	Atomic Models and Spectra
	Wed	30-Jul	31.1-31.4	The nucleus and radioactive decay
	Thu	31-Jul	31.5, 32.1-3	Half-life, Activity, and Medical Applications
	Fri	1-Aug	31.6, 32.6	Binding Energy and Nuclear Fission
	Mon	4-Aug		Week 6 HW Due
7	Tue	5-Aug	28.1-28.2	Einstein's Postulates and relativity of simultaneity
	Wed	6-Aug	28.2-28.3	Time Dilation and Length Contraction
	Thu	7-Aug		Week 7 HW Due and Study Day
	Fri	8-Aug		Final Exam