PH1110 Syllabus Summer 2019

Instructor Info:

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Office Hours: Summer Hours (In-Person or Video) by arrangement; please email

Materials

1. Required Text: <u>College Physics</u>, OpenStax College Publishing, ISBN 978-1-93816-00-0, available as a FREE PDF. Non-free print copies are also available. You will need a physical copy (print-out or purchased) during open-book exams.
2. Calculator (not your phone). A scientific calculator is sufficient for the course, but I recommend a graphing calculator for ease of entering more complicated calculations.
3. High-speed internet sufficient for streaming video, accessing course materials, etc. Some activities may use Java or Flash. Most students will want access every weekday.
4. Paid WebAssign account for completing online homework. The class key is posted on the Canvas Landing Page. There is a free trial period.

Course Overview

In PH1110, we will explore topics in forces and motion, energy and momentum, fluids, waves, and thermal physics. Using algebra and trigonometry, 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 forces and motion, energy and momentum, fluids, waves, and thermal physics.
3. Recognize appropriate values, measurement limitations, and units for physical quantities.

PH1110 supports University Student Learning Goal 2: Knowledge of the Physical and Natural World.

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. I can't see if 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. Make use of Piazza!
3. **Not Entirely Self-Paced:** The course material is divided into three units, each culminating with an exam. You may work on each unit at a faster pace than suggested, but assignments must be completed by their due dates and exams must be taken on the scheduled days. Each unit will open the Wednesday before the first assignments are due.
4. **Exams Must Be Proctored:** All course components EXCEPT exams are completed online. If you are not able to take exams at the Michigan Tech campus, you must arrange for an objective and disinterested proctor. Additional details are available on Canvas in the Introduction Module.

Course Components and Work Schedule

The course components are designed to scaffold your learning, which is especially important in an online course. Each day introduces a new topic. For each topic:

- Do the reading and take the *reading quiz* in Canvas
- Watch the video(s) and complete any online activities
- Take the *video quiz*
- Try (and eventually finish) the *WebAssign Homework*
- *Reflect* on your learning

Reading Quiz: The reading quiz on Canvas is a check that you have a basic understanding of the daily topic. Reading quizzes have a time limit of 30 minutes, and you only have one attempt, but your lowest 2 quizzes will be dropped.

Video Quiz: The video quiz on Canvas is a check that you understood the material in the video/activity, and gives you practice in the ideas you will use in the homework. If you have trouble with the quiz, you will want to review reading, video, and activities, and try again - you have three tries to get these questions right! One quiz will be dropped to allow for any technical issues.

Try the homework: Look over the WebAssign homework. Make a plan and work on each problem. You have five attempts for each problem. If any are giving you trouble, post on Piazza for help. Asking for (and giving) for help can count toward your *Reflect* grade.

Finish the homework: I suggest that you finish each topic's homework as you complete the topic. However, to accommodate as many student schedules as possible, the homework assignments for

any given week will be due on SUNDAY of the following week, except for the last week of class, where homework will be due on Friday. Your lowest homework grade will be dropped to allow for any technical issues.

Reflect on your learning: Over the course of the class, I expect each student to make 30 posts (one for each topic) to our class forum. These posts can be answering the *Reflect* prompt for each topic, asking a question about course material, or answering a question about course material. Your posts to the forum can appear anonymously to your classmates if you choose, and you can earn extra credit by making additional posts, up to a total of 45 posts.

Reading and video quizzes for each topic are due each day at 11:59 pm. Your own personal schedule will dictate the most appropriate timing to work on the course components. I suggest allowing something like 30 – 60 minutes to read and take the reading quiz, 60 – 90 minutes to watch the videos, do activities, and take the video quiz, 30 – 60 minutes to try the homework, and 2 hours to finish the homework.

Exams

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

Midterm 1: Tuesday, May 28

Midterm 2: Monday, June 10

Final: Friday, June 28

Exams for this course are hybrid computer/paper exams. The exam will be presented on Canvas (similar to your topic quizzes), but for some questions, you will need to show your work. You will record your work on paper, and your proctor will electronically return your work to me.

Please allow 90 minutes for your midterm exams and 120 minutes for your final exam. The final exam will be comprehensive with an emphasis on material from the third unit.

Exams are open book/notes and must take place under the supervision of a proctor. Calculators are recommended! Local students will use Michigan Tech's testing center. Distance students will need to arrange their own local proctors. Exams will take place **between 8:00 AM and 8:00 PM local time on the dates listed above. Be sure that your proctor is available during these times!**

Grading Policy

Your final grade will be determined using the following weights:

Assignment Group	Percentage
Reflect/Piazza Participation	5%
Reading Quizzes	10%
Video Quizzes	10%
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.

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 12 hours after the due date. 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.*

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 our class forum, Piazza. 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 call the Dean of Students Office, at (906) 487-2212 or view the policies here.

This course supports University Student Learning Goal #2: Knowledge of the Physical and Natural World.

If you require disability accommodation for any reason, please don't hesitate to contact me or the Dean of Students for guidance. Distance 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
1.1	13-May	Chapter 1 (all)	Unit conversion, Approximation, Uncertainty
1.2	14-May	2.1-2.5	Displacement, Velocity, and Acceleration in 1-D
1.3	15-May	2.6-2.8	1-D motion (cont.), Graphs
1.4	16-May	3.1-3.3	Vector addition, Decomposition
1.5	17-May	3.4-3.5	Projectile Motion, Relative Velocity
2.1	20-May	4.1-4.4	Newton's Laws
2.2	21-May	4.5-4.6	Weight, Normal, and Tension Forces
2.3	22-May	5.1-5.2	Friction and Drag
2.4	23-May	4.7	Integrating Forces and Kinematics
2.5	24-May	5.3	Elasticity, Stress, and Strain
3.3	27-May	none	**Memorial Day Recess**
3.2	28-May	none	**Midterm Exam 1**
3.3	29-May	7.1-7.4	Work, Kinetic and Potential Energy, and Cons. of Energy
3.4	30-May	7.5-7.7	Non-conservative forces, Power
3.5	31-May	8.1-8.3	Momentum, Impulse, and Conservation
4.1	3-Jun	8.4-8.5,8.7	Elastic and Inelastic Collisions, Propulsion
4.2	4-Jun	9.1-9.4	Torque, Equilibrium, CG
4.3	5-Jun	6.1-6.3, 6.5	Uniform Circular Motion and Newton's Law of Gravitation
4.4	6-Jun	10.1-10.3	Angular Acc, Rotational Kinematics, Moment of Inertia
4.5	7-Jun	10.4-10.7	Rotational Work/KE, Angular momentum
5.1	10-Jun	none	**Midterm Exam 2**
5.2	11-Jun	11.1-11.5	Density, Pressure, Pascal's Principle, Hydraulic Systems
5.3	12-Jun	11.6-11.8	Gauge Pressure, Buoyancy, Surface Tension, Capillary
5.4	13-Jun	12.1-12.4	Flow Rate, Continuity, Bernoulli, Viscosity
5.5	14-Jun	16.1-16.3	Simple Harmonic Motion
6.1	17-Jun	16.4-16.5	Pendulums and SHOs
6.2	18-Jun	16.9-16.11	Waves and Superposition
6.3	19-Jun	17.1-17.3	Sound Waves and Intensity
6.4	20-Jun	17.4-17.5	Standing Waves and Doppler Effect
6.5	21-Jun	13.1-13.4	Temp, Thermal expansion, KMT, Ideal Gases
7.1	24-Jun	14.1-14.4	Specific and Latent Heat
7.2	25-Jun	15.1-15.5	1st and 2nd Laws of Thermodynamics
7.3	26-Jun	15.6-15.7	Changes in Entropy
7.4	27-Jun	none	Study Day
7.5	28-Jun	none	**Final Exam (Comprehensive)**