PH2100 Course Syllabus, Summer 2025

Instructor Information

Instructor: Jae Suh jsuh@mtu.edu

Office: Fisher Hall 113

Online Office Hours: Individual meetings over Zoom are available upon request via email. If you have questions, please leave them on the Discussion board or email me with your questions before the meeting so that the instructor can be prepared.

Personal meetings (face-to-face) are also available via email request. You may contact the following TAs.

Teaching Assistants:	Casey Aldrich	ecaldric@mtu.edu
	Nathan Black	ndblack@mtu.edu
Physics Learning Center Coach:	David Gordon	djgordon@mtu.edu

Course Description

A calculus-based introduction to classical mechanics. Topics include kinematics, Newton's laws, impulse and momentum, work and energy, and the universal law of gravitation.

Instructional Materials

The purpose of the instructional materials is to enrich and support the learning outcomes for students. In addition, instructional materials are meant to increase student achievement by supporting student learning.

- Required materials
  - Embedded into Canvas using Inclusive Access - unless you opt out: *Physics for Scientists and Engineers: A Strategic Approach, 5th edition, Randall D. Knight with Access Kit to Mastering Physics. (Mastering Physics required to complete homework..)*
    - Please access this page for instructions on how to set up your MasteringPhysics account.
  - Scientific calculator (Graphing or programmable type.) Using cell phones, laptops, tablets, or other devices as a calculator during exams will not be allowed. or resources

All instructional materials are current and up-to-date.

Course Objectives

By the end of this course, you will be able to:

- Consistently apply basic university level mathematics (arithmetic, proportional reasoning, algebra, plane geometry, and elementary single variable calculus) appropriate to STEM fields of study to beginning mechanics problems.
- Correctly choose fundamental principles of mechanics to describe and model basic scenarios in kinematics, kinetics, conservation of momentum, and conservation of energy.
- At a beginning level, use multi-step problem solving approaches to technical problems of interest to science and engineering disciplines.
- Complete the computation of numerical results, reporting answers to the correct level of certainty (significant figures), with the inclusion of appropriate physical units.

Grading Scheme

Letter Grade	***Percentage***	***Grade points/credit***	***Rating***
A	92% & above	4.00	Excellent
AB	85% – 91.9%	3.50	Very good
B	80% – 84.9%	3.00	Good
BC	75% – 79.9%	2.50	Above average
C	70% – 74.9%	2.00	Average
CD	65% – 69.9%	1.50	Below average
D	60% - 64.9%	1.00	Inferior
F	59.9% and below	0.00	Failure
I	Incomplete; given only when a student is unable to complete a segment of the course because of circumstances beyond the student's control.		
X	Conditional, with no grade points per credit; given only when the student is at fault in failing to complete a minor segment of a course, but in the judgment of the instructor does not need to repeat the course. It must be made up by the close of the next semester or the grade becomes a failure (F). A (X) grade is included in the grade point average calculation as a (F) grade.		

Grading Policy

Grades will be based on the following:

Activity	Dates/Times	Points Possible
Engagement Points (Reading Quizzes, Exam Simulations, Group Problem Solving, Mastering Physics Homework, and Group Discussion)	Due approximately 2x a week	370 (~50%) (possible to earn more, but capped at 370.)
Midterm Exam	Thursday, May 29	150 (~25%)
Final Exam	Friday, June 20	150 (~25%)

Assignment Descriptions

Engagement Points:

Physics is like a sport or like learning a musical instrument. The only way to get good at it is to practice. Engagement points are intended to motivate practice activities that are likely to help you learn. (Discussing/answering questions in class, reading and engaging with the material in the textbook, and working practice problems alone and/or with others.)

You can earn engagement points in 5 different ways:

1. **Reading Quizzes:** A 10-point reading quiz in Canvas is due for each module. (13 modules, so 130 points total)
2. **Mastering Physics Homework**: A total of 33 Homework assignments of 5-7 points are due throughout the semester. (206.5 points total)
3. **Group Problem Solving/Peer Review:** Participation points will be assigned for providing thorough answers to assigned questions (3 points) as well as thoughtful responses to peer submissions (2 points). (13 modules, so 65 points total)
4. **End of Week Discussion:** Each discussion will be worth 3 points for every module that it covers. This discussion should be limited to physics concepts, please use the general course discussion board for administrative questions. (39 points total)
5. **Exam Simulations:** These 10–12-point Canvas quizzes are deep pools of previous exam questions. Take them as many times as you wish. They'll be different each time, and you keep your highest score. (9 simulators, 94 points total).

As you can see, there are just over 530 engagement points available during the semester. Students are expected to engage in course activities as they choose (and as their schedules allow) to reach the 370 point maximum. Note that because this cushion exists, as a general rule, deadline extensions or "excuses" for these activities will not be made.

NOTE: The 370 points corresponds to a minimum standard of course engagement. You are (of course) encouraged to do more as needed. Your previous experience with physics may require extra practice; the textbook has lots of extra problems in the back of each chapter, and the physics learning center and I can both help get your questions answered.

Exams

Exams are designed to assess your conceptual understanding and ability to work problems.

There will be 1 midterm exam and 1 final exam.

Both exams will be closed book and closed notes. You will be allowed a self-made reference for formulas on two 3.5" x 5" cards. You will need a scientific calculator for the exams; however, equations may not be stored in calculators.

Exams will be given through Canvas. Students will be expected to bring their own laptop with Respondus Lockdown Browser installed and tested. Laptops and battery packs are available for short term loan through the MTU library if needed.

Exams will need to be proctored at a testing center approved by the instructor a week prior to the exam date. The MTU testing center is a great example of a good place to take the exam, but other proctoring centers are available in different areas as well. Please see Michigan Tech's Proctoring page for more information on this.

More details about exam format will be shared in class as each exam approaches. Each exam will consist of 30 questions and be 120 minutes long. The questions and problems will be similar to the Stop to Think questions, exam simulator problems, clicker questions, and the graded homework problems (MasteringPhysics).

Course Policies

Behavioral standards, attendance, group work/collaboration, safety regulations, etc. (Try to keep syllabus language POSITIVE and explain reasons for policies. Remember, reading this syllabus may provide your students' first impression of you.) Below is an example.

Attendance: Students enrolled in a Fully Distance Education course will need to log in within the first four (4) class days of a Summer Session to remain officially enrolled in the course beyond the census date. If you do not log in to your courses within the add/drop period, your instructor may drop you from the course. Add, drop, and withdrawal deadlines are listed in the **Academic Calendar**

Absence from Final Examinations: A student who is absent from a final examination receives a grade of "0" for the examination and a grade of "F" for the course.

Late submission policy: Reading quizzes, Student workbook problem submissions, peer reviews, and participation in the weekly Q&A board will all have hard deadlines throughout the week- these assignments cannot be submitted late, and if they are left uncompleted the student will receive a score of "0". MasteringPhysics homework assignments will remain open after the deadline with some points subtracted for late submissions (12% credit deducted each day for with a cap of 50% off). Exam simulations will remain open all semester and the best score will be kept from all submissions.

For Student Conduct, Academic Integrity, the Grade of "Incomplete," Withdrawal without Penalty, Confidentiality in the classroom, Student Grievances, Proctoring, and Accessibility please refer back to the Syllabus.

Academic Integrity Rules

Specific course rules or policies regarding cheating, plagiarism, fabrication, and/or facilitation of academic misconduct.

Examples: Students may discuss homework assignments (if authorized), but are expected to individually work/write/solve any and all submitted work. All authorized resources used, including but not limited to internet sites (i.e. Chegg, Study Soup, Course Hero, etc.), should be appropriately cited. Please restrict all use of cell phones and/or other electronic devices during class to course-related activities. The focus of class time should be interaction between students, and with the instructor. Any other unauthorized activities are likely to be distracting to other students and the instructor. Please make sure to bring a calculator with you to class, so you can be appropriately prepared for assignments and/or exams. Calculators on other devices (computers, phones, etc.) are not allowed to ensure students do not communicate with others during exams. Because it's important to everyone at Michigan Tech that academic standards be maintained, academic misconduct may result in an appropriate conduct sanction/educational condition(s) imposed by the Office of Academic and Community Conduct and/or in an academic penalty (lower grade/failing grade) imposed by the faculty.

For more details on academic integrity, please review the Academic Integrity Policy of Michigan Tech [http://www.admin.mtu.edu/usenate/policies/p109-1.htm].

University Policies

Language and links in this section should be included on all syllabi to ensure compliance with Senate and governmental requirements.

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 accommodations or equal access to education or services at Michigan Tech, please call the Dean of Students Office at 906-487-2212. More information is also available from the Syllabi Policies webpage [http://www.mtu.edu/ctl/instructionalresources/syllabus/syllabus_policies.html].

Course Modules & Tentative Schedule

Week 1:

- Module 1: Concepts of Motion
- Module 2: Kinematics in One Dimension
- Module 3: Vectors and Coordinate Systems

Week 2:

- Module 4: Kinematics in Two Dimensions
- Module 5: Force and Motion

Week 3:

- Module 6: Dynamics 1: Motion Along a Line
- Module 7: Newton's Third Law

Week 4:

- Module 8: Dynamics 2: Motion in a Plane
- Midterm Exam

Week 5:

- Module 9: Work and Kinetic Energy
- Module 10: Interactions and Potential Energy

Week 6:

- Module 11: Rotation of a Rigid Body
- Module 12: Impulse and Momentum

Week 7:

- Module 13: Newton's Theory of Gravity
- Final Exam