

Teaching for Curiosity, Community, and Understanding

Jacob Rodgers

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Statement of Teaching Philosophy

From my experiences as both a teacher and a student, I believe that learning is a social process as much as it is an individual one. With this view, students develop their understanding through conversation, comparing ideas, and engaging with their peers. This positions the teacher not as the sole source of knowledge, but as a facilitator who supports students as they connect and refine their ideas. As a teaching assistant for the PH 20x series, Algebra-Based Introductory Physics for the Life Sciences, I work with many students who enter the course expecting, or “knowing”, physics to be “not for them.” These experiences have shown me that the process of facilitation is best nurtured by acknowledging where students are starting, grounding new concepts in relevant applications, and co-creating a classroom atmosphere where students feel safe to be curious.

To support this kind of learning, I draw on research-based instructional strategies and practices that foreground student reasoning, collaboration, and the co-construction of knowledge. In the PH 20x classroom, where students arrive with varying levels of math and physics preparation, I have found that using multiple representations and types of engagement helps students access physics ideas from their different entry points. For example, when addressing the idea that acceleration does not always point in the direction of velocity, I utilize the familiar scenario of a vehicle coming to a stop. After polling the class for their intuitions and igniting a brief class discussion, students then work in smaller groups to sketch the vehicle’s motion and label the corresponding vectors. This quick representation task allows students with less preparation to draw on their lived experience while encouraging more advanced students to articulate why the acceleration vector points opposite the velocity. Therefore, using a range of collaborative and sensemaking focused strategies has enabled me to meet students where they are and foster the independent, community driven learning that helps them grow as physicists.

These short group activities naturally double as opportunities to assess student learning. As groups work, I move around the room, often rolling between tables in a chair, so that I can join students at their eye level. This positioning approach not only allows me to listen in on their conversations, ask probing questions, and scan their whiteboards for emerging ideas, but it also often serves as a catalyst for students to voice uncertainties they might otherwise keep to themselves. Many students wait until I “roll by” to ask the question that has been stumping them, giving me real-time evidence of where they are and how to support their next steps.

I regularly assess the efficacy of my teaching by collecting student feedback at the end of each term. I provide a short Google form asking students which aspects of my class were most helpful and what could be improved. This practice not only allows me to reflect on my teaching, but also invites students to help shape the course through their feedback about what supports their learning. From these responses, the vast majority of students share that they feel at ease asking questions and contributing their ideas, highlighting the sense of openness and support the class works together to cultivate. For example, one student wrote, “[You] created an environment where students felt safe asking questions and could always expect beneficial feedback,” while another noted, “Takes the time to thoroughly teach concepts and is very approachable for questions and help.” Feedback like this reassures me that my strategies are effective and motivates me to continue refining my teaching to better support all learners.

Jacob Rodgers

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Education

Oregon State University M.S. Physics Graduate Certificate in College and University Teaching	Corvallis, OR September 2024–June 2026 (<i>expected</i>)
Michigan State University B.A. Physics Minor in Computational Mathematics, Science and Engineering	East Lansing, MI April 2024

Teaching Experience

Oregon State University

Graduate Teaching Assistant

Experience spans studio, recitation, and fully online (Ecampus) instruction in large-enrollment introductory physics courses.

Spring 2026	PH 211 General Physics with Calculus (Studio Lead)
Winter 2026	PH 202 General Physics (Recitation), 170 students
Fall 2025	PH 201 General Physics (Recitation), 150 students
Summer 2025	PH 211 General Physics with Calculus (Ecampus), 28 Students
Spring 2025	PH 211 General Physics with Calculus (Studio)
Winter 2025	PH 202 General Physics (Recitation), 210 students
Fall 2024	PH 211 General Physics with Calculus (Recitation), 30 students

Michigan State University

Undergraduate Learning Assistant

Served as primary instructional lead for student groups in a reformed, active-learning introductory physics course, acting as the main point of contact and facilitator of collaborative learning.

Spring 2024	PHY 183B Physics for Science and Engineers I, 65 students
Fall 2023	PHY 183B Physics for Science and Engineers I, 45 students
Spring 2023	PHY 183B Physics for Science and Engineers I, 39 students
Fall 2022	PHY 183B Physics for Science and Engineers I, 40 students

Curriculum Development

Accessibility Focus, PH 211 (Fall 2024)

Implemented new recitation worksheets to improve accessibility, by refining Canvas pages and solutions using accessibility checks (e.g., formatting, color contrast, and screen reader compatibility).

Physics Projects Redesign, PHY 183B (2023-2024)

Reconstructed in-class projects to improve conceptual clarity, by simplifying problem setup and developing clearer diagrams in collaboration with the course instructor.

Mentoring

Graduate Student Mentoring Program, Department of Physics

GTA Mentor

Served as a graduate student mentor in the departmental mentorship program, supporting a first-term graduate student in their transition to being a graduate teaching assistant by meeting weekly to support their teaching and provide resources within the department.

Oregon State University

Fall 2025

Mutual Mentors Workshop

Participant

Completed a five-week hybrid institute through the Center for Teaching and Learning focused on peer mentoring and classroom observation, developing skills in reflective dialogue, structured conversational techniques, and data-based approaches to observing and supporting teaching practice.

Oregon State University

Summer 2025

WaMPS Undergraduate-Undergraduate Peer Mentoring Program

Undergraduate Mentor

Served as an upperclassman mentor in a departmental peer mentoring program, supporting newer physics students in navigating the undergraduate physics curriculum and building connections within the department.

Michigan State University

2023-2024

Research Experience

Oregon State University – Dept. of Physics

Graduate Research Assistant – OSU Physics Education Research

Advisor: Elizabeth Gire, Ph.D.

Corvallis, OR

March 2025–Present

- Conducted quantitative analysis of student enrollment and performance data to represent pathways through the physics major at Oregon State University, which features a unique upper-division curriculum: Paradigms in Physics.
- Focused on identifying common course sequences, dropout points, and retake patterns to inform curriculum development and student support strategies.
- Designed and conducted semi-structured interviews with faculty across multiple institutions to investigate approaches, challenges, and attitudes surrounding program assessment practices in higher education physics programs.

Michigan State University – Dept. of Physics and Astronomy

Undergraduate Researcher – Physics Education Research Lab

Advisor: Marcos “Danny” Caballero, Ph.D.

East Lansing, MI

September 2022–August 2024

- Employed a qualitative interview process to try to understand computation being integrated into high school physics classrooms.
- Explored insights into how the students perceive and interact with computation, as well as the practices employed in the classroom.

Michigan State University – Dept. of Physics and Astronomy

Undergraduate Researcher – Physics Education Research Lab

Advisors: Paul Irving, Ph.D. & Daryl McPadden, Ph.D.

East Lansing, MI

March 2022–September 2022

- Deployed a card sort interview format to analyze a student’s experience, in order to gain insight on how the class is perceived.
- Deduced dissonances in the way this teacher taught physics based on the practice they may be trying to teach, and how a student interacts with those dissonances.

Relevant Coursework

Michigan State University

TE indicates classes taken in the Department of Teacher Education

TE 150	Reflections on Learning
TE 101	Social Foundations of Justice and Equity in Education
TE 302	Literacy and Adolescent Learners in School and Community Contexts
PHY 804	Survey of Physics Education Research

Oregon State University

CSSA indicates classes taken in College Student Services Administration

GRAD indicates courses taken from the Office of Graduate Education

CSSA 552	Student Development in Universities and Colleges
GRAD 560	Theories of Teaching and Learning in Higher Education
GRAD 561	Course Design and Methods for College and University Teaching
GRAD 607	Capstone Seminar in College and University Teaching
GRAD 610	Internship in College and University Teaching

Presentations

Contributed Talks

1. J. Rodgers, P.C. Hamerski, D. McPadden, M.D. Caballero, P.W. Irving, "Computation in High School Physics: How the pieces fit together", *American Association of Physics Teachers Summer Meeting (AAPT)*, Grand Rapids, Michigan. July 2022.

Posters

1. J. Rodgers, P.C. Hamerski, D. McPadden, L. A. H. Wood, M.D. Caballero, "Cataloging Engagement In Computational Practices In A High School Physics Classroom", *University Undergraduate Research and Arts Forum (UURAF)*, East Lansing, Michigan. April 2023.
2. J. Rodgers, P.C. Hamerski, D. McPadden, M.D. Caballero, P.W. Irving, "How do curriculum design decisions influence student expectations around physics and computation in a computation-integrated physics high school classroom?", *American Association of Physics Teachers Summer Meeting (AAPT)*, Grand Rapids, Michigan. July 2022.
3. J. Rodgers, P.C. Hamerski, D. McPadden, M.D. Caballero, P.W. Irving, "How do curriculum design decisions influence student expectations around physics and computation in a computation-integrated physics high school classroom?", *Oslo PER Summer Institute (OPSI)*, Oslo, Norway. June 2022.

Service

- **Member** Coalition of Graduate Employees 2024–Current
- **Executive Board Member** Michigan State University Special Olympics 2023–2024
Worked closely with other members of E-Board to maintain a stream of communication between E-Board and the members of the club.
- **Volunteer** Michigan State University Special Olympics 2022–2024
Facilitate individuals with intellectual disabilities in participating in inclusive sports and other activities.
- **Member** Society of Physics Students (SPS) Michigan State Chapter Member 2021–2024

Technical Experience

Programming

- Proficient: Jupyter, Mathematica, Python, R Studio, SQL

Software

- Proficient: Microsoft Office, LaTeX, MAXQDA

Awards

- Oregon State University – Graduate Teaching Assistant Award, Honorable Mention 2026
- Michigan State University – Undergraduate Learning Assistant Award 2024

Summary and Analysis of Student Evaluations

Overview

The following teaching evaluations reflect my work as a Graduate Teaching Assistant for PH 201 and PH 202 at Oregon State University during Fall 2025 and Winter 2026. These courses are introductory algebra-based physics courses in which I taught recitation sections of up to 30 students.

Because standard departmental evaluations are typically directed toward the course instructor rather than graduate teaching assistants, I developed and distributed a separate feedback survey focused specifically on students' experiences within recitation. Students were encouraged to complete this survey so that I could directly reflect on and respond to feedback regarding my teaching practices, classroom facilitation, and student support.

The responses included in this portfolio therefore represent targeted feedback on my role in facilitating small-group learning, guiding discussion, and supporting student engagement within recitation sections.

Quantitative Summary

All items rated on a 1 (Strongly Disagree) to 5 (Strongly Agree) scale for the PH201 (F25) and PH202 (W26) courses.

Survey Item	F2025	W2026
I felt comfortable asking questions or expressing ideas in this class.	4.80	4.44
After taking this class, I feel more prepared to succeed in future physics courses.	4.27	4.25

Qualitative Themes

Across evaluations, students consistently described my teaching approach as approachable, patient, and supportive. Many comments emphasized the interpersonal aspects of recitation, particularly noting that I was easy to talk to, willing to listen, and responsive to student questions. Students also frequently described feeling comfortable seeking help and participating during class, suggesting that the recitation environment encouraged active engagement with course material.

- *"Jake is really wonderful at walking us through solutions and why ideas of ours would not wouldn't work. He is also kind and very easy to ask go to for help."*
- *"The way he explains concepts makes them seem less intimidating and more understandable."*
- *"He is very kind, supportive and encouraging towards us. He also explains everything very well and makes sure people don't leave confused."*
- *"A willingness to help the students, the ability to explain concepts and utilize demonstrations, as well as creating a friendly classroom environment."*

Taken together, these comments suggest that students valued not only instructional support, but also the classroom atmosphere cultivated within recitation sections.

Response to Feedback

One recurring theme in student feedback involved time management during recitation, particularly requests for additional time to work collaboratively in groups before transitioning to whole-class discussion. In response, I began preparing more streamlined solution walkthroughs ahead of time so that a greater portion of class could be dedicated to student group work and collaborative problem solving.

This adjustment aligns closely with my teaching philosophy, which emphasizes student sensemaking, discussion, and peer interaction as central components of learning.

Sample Syllabus

The following syllabus was developed as a revision of the course materials for *PH 201*, a course for which I served as a Teaching Assistant. This revision was completed as part of a course design class I took and reflects a medium-level redesign of the original syllabus. The changes focused primarily on improving alignment between course structure, assessment, and stated learning goals, with particular attention to ideas from the literature on student-centered learning. In particular, I replaced a traditional final exam with a final group project designed to better assess students' ability to justify physical models and communicate their reasoning using multiple representations.

This revised syllabus reflects my instructional philosophy and the curricular improvements I would prioritize in a future instructor-of-record role. In preparing this version for inclusion in my teaching portfolio, I also streamlined the document to better highlight its instructional design features. In particular, I removed standard institutional policy language from the end of the syllabus and relocated it to an appendix. This decision was made to reduce redundancy with university-provided policy documents and to keep the focus of the syllabus on course design, expectations, and learning structure.



General Physics
PH 201
3 Credits

Instructor: Jacob Rodgers (he/him)
Email: rodgerja@oregonstate.edu
Office: Weniger 497

Class Meeting Times

Lecture: 3 hrs / week on Monday, Wednesday, and Friday
Recitation: 1 hr / week

Prerequisite and/or Corequisite

Enforced Prerequisites: (MTH 112Z, 112, 227, 228, 251Z, 251HZ, 251, 251H, 252Z, 252HZ, 252, 252H, 253Z, 253, 254, 255, 256, 264, or 265) or minimum score of 075 in 'Math Placement - ALEKS'

Catalog Course Description

Surveys a broad spectrum of classical and modern physics topics. Develops scientific analysis and problem-solving techniques through study of such topics as kinematics, mechanics, momentum, and energy. Builds models for physical phenomena through qualitative and quantitative observations, comparison with theory in multiple representations, and evaluative sensemaking.

Course Specific Measurable Student Learning Outcomes

An overarching learning goal for this course is the ability to transfer problem solving and critical thinking skills to novel problems. This will be accomplished by focusing on the following learning outcomes.

- Justify under what circumstances it is appropriate to use different common physics models
- Utilize and convert between multiple forms of information representation

Scaffolded instruction and formative assessment of these outcomes will occur throughout the lecture and homework cycle. Actionable feedback will be provided throughout this process allowing students to evaluate their own progress through the learning process. Summative assessment of these outcomes will occur in the form of a midterms and a final project.

Course Content

Week	Topics	Assessment
0	General Review	
1	Vector Operations, Average Quantities	
2	Average Quantities, Graphical Analysis	
3	Kinematics - 1D	
4	Kinematics - 2D Forces - Introduction	
5	Forces - Newton's Laws, Friction	Midterm
6	Forces - Inclined Planes, Coupled Systems, Pulleys, Uniform Circular Motion	
7	Momentum - Impulse, Conservation	
8	Momentum - Conservation, 2D Energy - Work, Kinetic, and Potential Energy	
9	Energy - Conservation	Project Check-In
10	Energy - Systems, Collisions	
11		Project Due

Course Structure

This course is designed to support your success through a flipped classroom pedagogy which moves the one-way dissemination of information from the traditional lecture to short videos and readings students will complete before class. Informal group work is HIGHLY encouraged in this course as research repeatedly shows it strongly improves most students' learning.

The course structure is as follows:

Lecture: Students are expected to arrive having completed all assigned readings and video introduction content before each class. In-class time will focus on applying this preparation through scaffolded problems designed to address common preconceptions and develop qualitative and quantitative models. Preparedness will be regularly assessed through low-stakes formative clicker questions.

Challenge Homework: Students will complete weekly written solutions. These are designed to encourage group work and build scientific communication skills.

Recitation: Weekly recitation meetings will give students an opportunity to solve problems on their own, then revisit them in groups. A smaller student to teacher ratio in these meetings allows for more individualized support.

Midterm Exam: One midterm exam will serve as a summative assessment during the term. The exam will be cumulative, covering all material to that point with an emphasis on the most recent content. It will feature a mix of multiple choice and written response questions emphasizing both conceptual and quantitative analyses.

Final Project: In place of a final exam, students will complete an authentic assessment project designed to reflect the kinds of problems and contexts encountered in professional settings. The project emphasizes learning by doing, science communication, and collaborative group work, and is intended to mirror the realism of challenges faced in the field. Groups will be required to complete a check-in meeting with the instructor by Week 9 to discuss progress. The full project rubric will be posted separately.

Support for this course comes in many forms.

- Learning Assistants (LAs) are fellow students who have previously taken the PH20x or PH21x courses, succeeded, and are returning as part of the teaching team to help the next cohort succeed. Students will notice several LAs helping during lectures.
- LAs will also host weekly Learning Assistant Homework Help Hours (LAHHHs). These are times to drop in and work with classmates on homework or studying. LAs are there to guide, advise, minimize stress and frustration, but not to give answers as correct answers are not the goal. The goal is learning the skills and creating a strong mental model of the physics. Neither of which depend on correct answers!
- The Wormhole (<https://wormhole.physics.oregonstate.edu>) is a help center staffed by graduate teaching assistants in the physics department, and occasionally LAs.
- Supplemental Instruction tables are regularly scheduled help sessions that students register for at the beginning of each term. They are free!
- Lastly, your instructors will have weekly office hours. Students come to office hours to work on homework, ask a personal and/or logistical question about the course, get help on a sticky subject, or ask questions about physics phenomena.

Evaluation of Student Performance

This course and its learning outcomes will be measured through a mix of formative and summative assessments.

Course grades are calculated using a weighted average of the following categories.

Lecture Participation	25%
Challenge Homework	20%
Recitation	20%
Midterm	10%
Project Check-In	5%
Final Project	20%

Notes:

- The percentage for lecture participation will be calculated by dividing a student's score by 85% of the maximum points possible for that category. This provides forgiveness for when life gets in the way of a student's participation in the course.
- Challenge homework assignments will receive a 5% penalty per day after the due date, capping at a 50% penalty. There is no need to request extensions, students should complete the work and submit it as soon as they are able.
- Each category is capped at full credit. Example: a student achieves 120% of the lecture participation points, they will receive the full 25% towards their course grade for lecture participation, not more.

- In-class lecture participation is graded on completeness. Full points will be awarded for both correct and incorrect answers to questions.
- Students may miss one recitation without penalty. If more are missed, the recitation leader should be contacted.
- No student work will be accepted after 11:59 pm on the Sunday before finals week begins. (For a summer course, the deadline is instead 11:59 pm on the day of the final exam)

The letter grade scale is presented below:

Grade	Percent Range
A	90 - 100
A-	88 - 89
B+	86 - 87
B	80 - 85
B-	78 - 79
C+	76 - 77
C	70 - 75
D	60 - 69
F	0 - 59

Learning Resources

This course utilizes several resources in concert, and where possible, open educational resources have been integrated or created to minimize cost to students. There is no required textbook to purchase. Course materials, organization, and content are housed across free platforms provided to students at the start of the term, with links to each resource shared via the course site.

The only required resource which carries a price tag is a subscription to Learning Catalytics. This can be purchased at the OSU Bookstore. It is required for PH201, PH202, and PH203, so a 12-month subscription is appropriate for most, but not all, students.

Course Statements

Generative “Artificial Intelligence”

Use of generative AI (genAI) tools such as ChatGPT is strongly discouraged in this course and in a number of cases, strictly prohibited. Continue reading through this policy for details. Violation of this policy is a violation of the [Code of Student Conduct](#).

GenAI Course Policies:

- All work submitted for this course must be a representation of your own thoughts and ideas (or your group's where applicable). You should be able to reproduce any submitted work without genAI.
- For challenge homework and exams, you need to, by hand, write, draw, or otherwise create any words, figures, algebra or other representations that you submit. **No typed work will receive credit**, unless you have a relevant accommodation through DAS.
- For work submitted in this course, **you must use the notation taught in this course**, such as what is presented in the pre-lecture videos, lecture videos, the BoxSand Introduction text, or during class. Credit may not be given for alternative notions.
- Do not copy or represent genAI, another human, or any other source's thoughts or work as your own. If you worked with other humans, **provide attribution**.
- It is prohibited to ask for a solution, answer, outline, or any other assistance for a homework, in-class, recitation, exam, or any other assignment for which you are asked to submit work.
- It is prohibited to use or copy any part of a generated solution, answer, outline, or other assistance for work submitted in this course.

Permitted uses of genAI:

- Generate practice problems when studying
- Asking for an alternate explanation of a concept you did not understand in class
- Looking up definitions (e.g., the moment of inertia for an object, trig identities)

Instructor Advice:

The best route to success in this course is to engage earnestly with the materials. When you encounter questions which are difficult to solve, it is a chance to learn. Wrestling with a problem is an important part of the learning process. If you unload your challenge onto genAI, you are not only depriving yourself of that growth, but you are helping to train the algorithm. If it learns the skills you are intended to learn, it may just take your job when you graduate.

We designed each of the assignments and resources in this course to best facilitate your learning of physics. Please engage with each assignment on your own, or in groups, without the assistance of genAI. You will be required to work through physics problems on your own during exams, where you will not have access to genAI tools.

If you are struggling with a problem for more than 15 minutes without making progress, seek help, preferably from classmates, learning assistants or another member of the teaching team, peer, or an [OSU tutoring center](#). Science is inherently a social and collaborative effort among humans, where individual proficiency is also needed for full engagement. You are strongly encouraged to work on assignments collaboratively.

Concerns with genAI:

Use genAI responsibly and encourage others to do the same. Using genAI ethically and responsibly includes considering unintended consequences of your usage. Some points to consider to use genAI responsibly:

- GenAI discourages, and in some cases hurts (see [Gerlich+25](#) and [Lee+25](#)), the development of critical-thinking and sensemaking skills, which are extremely important to develop and strengthen early in your education.
- There are a variety of ethical concerns surrounding genAI. [This website](#) has a list of common concerns and ethical challenges associated with genAI. These include bias and discrimination, privacy concerns, and transparency.
- GenAI comes with a high environmental cost. GenAI data centers use a large amount of energy and water. [This website](#) lists some of these concerns in more detail.
- GenAI is often incorrect, and the output should always be questioned. GenAI can often give gibberish that sounds sophisticated enough that it fools non-[physicists/mathematicians] but is clearly genAI to an expert. You need to be diligent about checking and verifying the output, particularly if you are using it to help you understand [physics/math]. The sensemaking tools we have been honing up will help your ability to check the output.

If you have questions about genAI use on a particular assignment or assessment, talk to your instructor prior to beginning the task. If you have any questions about this policy, ask your instructor. The instructors of this course will not be using genAI to produce study resources, assignments, exams, or to assess work. We have also designed the course so that you do not need to use gen AI to learn and succeed.

Academic Calendar

Statement Regarding Students with Disabilities

Student Bill of Rights

Reach Out for Success

Student Evaluation of Courses

Core Education Category Learning Outcomes

Classroom Survey

Short survey about my time as your TA! Responses will be kept completely anonymous and will not be collected for a grade. This survey is purely a way for me to improve as a TA, be as thorough as you'd like, any input is helpful input!

1. What qualities of your instructor do you regard as good or outstanding?

2. Are there areas in which your instructor needs improvement? Please be specific.

3. Do you have any other helpful comments about this instructor's performance?

4. On a scale of 1 (Strongly Disagree) to 5 (Strongly Agree):
After taking this class, I feel more prepared to succeed in future physics courses

1 2 3 4 5



5. **(Optional)** Explain the reasoning behind your rating, and/or offer ideas for improvement in this area

6. On a scale of 1 (Strongly Disagree) to 5 (Strongly Agree):
I felt comfortable asking questions or expressing ideas in this class.

1 2 3 4 5



7. **(Optional)** Explain the reasoning behind your rating, and/or offer ideas for improvement in this area

Student Evaluation Charts

On a scale of 1 (Strongly Disagree) to 5 (Strongly Agree): After taking this class, I feel more prepared to succeed in future physics courses

15 responses

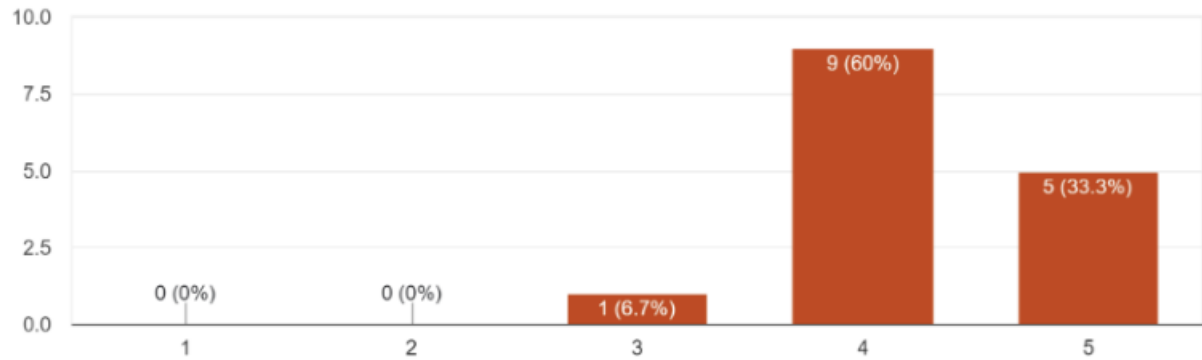


Figure 1: F25 Responses to Q1

On a scale of 1 (Strongly Disagree) to 5 (Strongly Agree): I felt comfortable asking questions or expressing ideas in this class.

15 responses

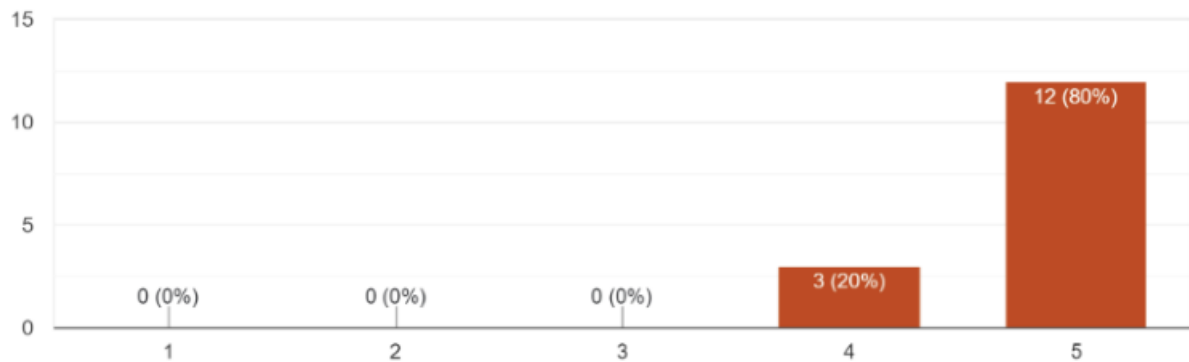


Figure 2: F25 Responses to Q2

On a scale of 1 (Strongly Disagree) to 5 (Strongly Agree): After taking this class, I feel more prepared to succeed in future physics courses
55 responses

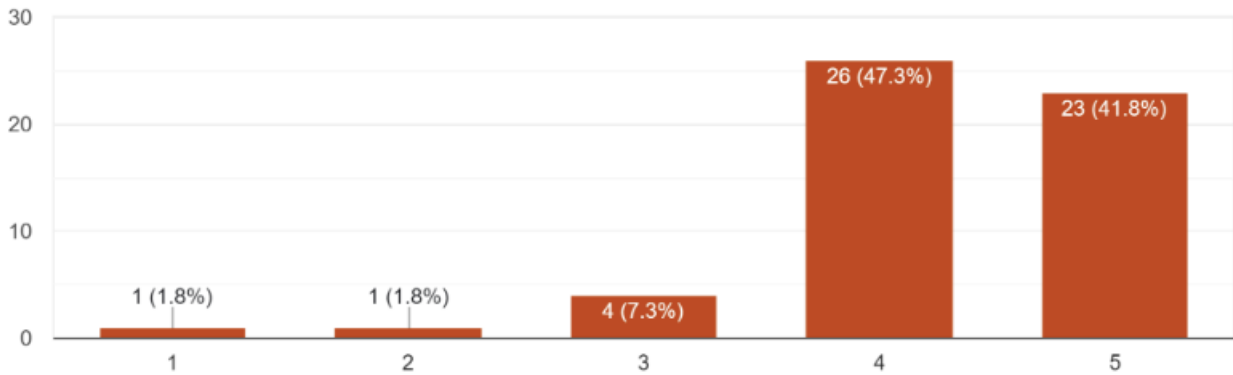


Figure 3: W26 Responses to Q1

On a scale of 1 (Strongly Disagree) to 5 (Strongly Agree): I felt comfortable asking questions or expressing ideas in this class.
55 responses

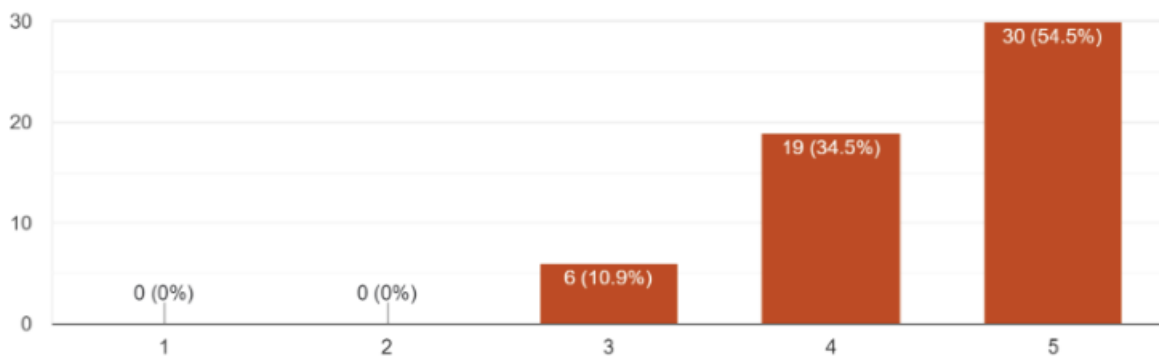


Figure 4: W26 Responses to Q2

PH 201 Syllabus – Institutional Policy Sections

This appendix contains the standard institutional and university policy sections from the PH 201 syllabus, included here for completeness.

Academic Calendar

All students are subject to the registration and refund deadlines as stated in the Academic Calendar:
<https://registrar.oregonstate.edu/osu-academic-calendar>

Statement Regarding Students with Disabilities

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at <http://ds.oregonstate.edu>. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

Student Conduct Expectations

Student Conduct Expectations link: <https://beav.es/codeofconduct>

Student Bill of Rights

OSU has twelve established student rights. They include due process in all university disciplinary processes, an equal opportunity to learn, and grading in accordance with the course syllabus: <https://asosu.oregonstate.edu/advocacy/rights>

Reach Out for Success

University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about resources that assist with wellness and academic success at oregonstate.edu/ReachOut. If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255).

Student Evaluation of Courses

During Fall, Winter, and Spring term the online Student Learning Experience surveys open to students the Wednesday of week 9 and close the Sunday before Finals Week. Students will receive notification, instructions and the link through their ONID email. They may also log into the system via MyOregonState or directly at beaves.es/Student-Learning-Survey. Survey results are extremely important and are used to help improve courses and the learning experience of future students. Responses are anonymous (unless a student chooses to "sign" their comments, agreeing to relinquish anonymity of written comments) and are not available to instructors until after grades have been posted. The results of scaled questions and signed comments go to both the instructor and their unit head/supervisor. Anonymous (unsigned) comments go to the instructor only.

Core Education Category Learning Outcomes

This is a Core Education course that fulfills the requirements for the Scientific Inquiry and Analysis category. In addition, this course also fulfills the Baccalaureate Core requirements for the Physical Science category.

Learning Objective	How this outcome will be addressed in this course	How this outcome will be assessed in this course
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<p>Utilize scientific language, concepts, hypotheses, theories, and laws of basic natural sciences.</p>	<p>This course covers the fundamentals of translational mechanics where students learn scientific language, physical theories, and problem-solving strategies applied to the study of kinematics, forces, momentum, and energy. Every learning module is built around a topic where there is a clear learning cycle that includes pre-lecture study (reading and videos), active engagement lecture, and post-lecture homework.</p> <p>Specifically, students are familiarized with the basic concepts, hypotheses, and theories of the natural world during pre-lecture study. During lecture they work independently and in groups to analyze a scaffolded set of systems where features of the theory are gradually introduced and assimilated into the mental framework students construct. Post-lecture homework asks students to solidify the knowledge gained in lecture through a set of questions that address the learning outcomes of the module. Here they get to practice communicating clear solutions that utilize the multiple representations presented in the course which include words, math, figures, graphs, tables, and more. They are taught to use these representations to aid a clearly communicated solution. These representations can also be used as sensemaking tools to assess the validity of their solutions.</p>	<p>This outcome will continually be assessed through formative feedback with responses during lecture and through homework. Clicker question quizzing provides instant feedback on correctness while handwritten assignments are graded by humans with partial credit and written feedback provided.</p> <p>This outcome will also include summative assessment through midterm exams and/or quizzes and a final project. Students will be provided with a range of questions that assess their fundamental mastery of the language and application of theory. These include multiple choice, short response, and free response. In the free response students will be expected to present solutions that demonstrate the use of multiple representations (drawings, words, math, graphs).</p>
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<p>Apply the cyclical process of science and think critically by constructing consistent explanations and drawing conclusions based on empirical evidence and current scientific understanding.</p>	<p>This learning outcome is addressed during lab exercises and the sensemaking exercises that students complete during lecture and written homework.</p> <p>In lab, students make predictions for the outcomes of physical experiments based upon their understanding of physical theory presented in lecture. After making predictions, experiments are performed where empirical data is collected. Students then use this data to make conclusions about the nature of physical systems. This involves thinking critically and constructing and re-constructing their mental framework of physical laws. Conclusions are compared with predictions to arrive at a self-consistent model.</p> <p>In this course, we focus on evaluative sensemaking. This is often phrased as checking if your answer is reasonable or not. The evaluative sensemaking process consists of making a prediction with an explanation, then a comparison. First, students make a prediction of what they would expect their answer or solution to look like, based on one of several techniques, including sign, dimensionality, covariation, and related quantities sensemaking. Then, students provide an explanation for the prediction using arguments based in physical reasoning. Finally, students make a comparison between the answer that they found and their prediction. If the prediction and outcome do not match, students revisit their solution and/or prediction in order to arrive at a self-consistent model.</p>	<p>Formative assessment of this outcome will occur in post-lecture homework. Students will receive written feedback on post-lecture work.</p> <p>This outcome will also be assessed through summative exams. Exams have questions which feature real or recreated empirical evidence from which students must make conclusions and explanations. Evaluative sensemaking will also be featured in exam questions where students will be prompted to perform a sensemaking analysis which will be assessed on the validity of its application.</p>
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<p>Articulate the consequences and implications of science for society, daily life, and decision-making.</p>	<p>Physics is principally the study of the world around us. In this course we explore and develop methods and skills for analyzing and making predictions about physical interactions and systems encountered on Earth. By mastering kinematic, force, momentum, and energy analysis techniques, students gain the ability to understand the why behind many events and systems they observe in life.</p> <p>These quantitative and conceptual analysis techniques are the fundamentals upon which the PH 201, PH 202, and PH 203 general physics sequence construct understanding of technological innovations like electronic devices, household appliances, medical imaging methods like MRI and ultrasound, societally important issues such as global warming, water infrastructure, and even political and economic arguments and events.</p> <p>Along with the specific techniques and knowledge, students in the physics sequence also build general problem-solving skills, like the ability to synthesize and transfer knowledge. In this course, we have made a large effort to create a curriculum which addresses many commonly experienced situations from everyday life, seeking a conceptual and/or mathematical explanation.</p>	<p>Category Specific Learning Outcome #3 (CSLO3) will be assessed through a paper that will be the culmination of weekly assignments that students complete. Students have a weekly assignment that works on current real-world problems. These assignments focus on using the skills learned in class to analyze synthesis questions with the aid of multiple representations and the use of formal sense-making techniques. The essential assignment for CSLO3 will be a project at the end of the assignment series that asks students to explore topics learned throughout the term more deeply, using the tools demonstrated in the weekly assignments. Students will be expected to analyze the physics in challenges faced by society and explore implications of the choices we make.</p>
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