

GENERAL PHYSICS I, WINTER 2025

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PHYS& 114, no 24423/24424 | 6 credits | Jan 6 – Mar 21

Canvas Class Direct Link: <https://tacomacc.instructure.com/courses/2543263>

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PROFESSOR INFORMATION

Professor Information

- Personal names: Jason Isenberg
- Office Hours: 1 hour following class or as arranged for in person or [via Zoom](#)

Welcome Message

Physics is one of the most fundamental scientific disciplines as its main goal is to understand how the universe behaves. Being a quantitative science, physics requires us to be comfortable with math and its proper application to the solution of problems related to a variety of physical systems. In addition, intuition and logical reasoning can be helpful when applied carefully. Thus, the study of physics can help us further develop our critical thinking and problem-solving skills, which are valuable in all facets of our modern world.

The General Physics series (PHYS& 114/115/116) at Tacoma Community College (TCC) gives us a broad overview of classical and modern physics. PHYS& 114 focuses on mechanics: describing motion, its fundamental laws, and the concept of energy. It is an algebra-based course that is best learned through practice and hands-on experience. Therefore, lectures will include plenty of active-learning exercises to sharpen our critical-thinking skills and to practice solving quantitative problems. Laboratory experiments will help us to solidify our understanding of physics and its many applications, while self-check assignments and quizzes will provide us with plenty of opportunities to practice complex problem-solving scenarios.

Teaching Philosophy

I believe that emphasizing the process of science while conveying new knowledge to students is vital in the teaching process. Thus, I challenge students to develop problem-solving and critical-thinking skills, abilities that go beyond the memorization of facts and prescriptions.

I aim at achieving the highest standards possible in every course I teach. Therefore, I will review all of your assignments promptly and will give you detailed feedback whenever necessary. I will admit when I do not know enough about a particular subject and will make every effort possible to learn more about it. I will never make things up. I enjoy learning from you as much as I enjoy sharing the knowledge that I have previously acquired.

Personal Statement on Equity, Diversity, and Inclusion

I strive to facilitate equitable instruction, encouraging each student to be their whole authentic self when participating in the courses I teach. I believe that diversity in its many forms enriches everyone's learning experience and that only through the inclusion of all voices in our curriculum, intentionally emphasizing those that have been historically silenced, one can claim true academic rigor.

GENERAL CLASS INFORMATION

Class Information and Modality

General Physics I, PHYS& 114, is an in-person course. What this means is that lectures, laboratory experiments, and some assignments will be conducted in physical classrooms on the main TCC campus.

Schedule and Location

- Lectures: Tuesday, Friday 2:30-4:20pm, Wednesday 3:30-4:20pm (Bldg. 15, Rm. 301)
- Laboratory: Thursday 2:30-4:20pm (Bldg. 15, Rm. 124L)

Catalog Description

Algebra-based physics for liberal arts students and certain professions. Study of basic mechanics including position, velocity, acceleration, forces, momentum, and energy. Laboratory included.

Prerequisites

Math at the 100 level with a minimum grade of C (may be taken concurrently). Recommended Preparation: MATH& 141.

Textbooks & Supplemental Materials

- Textbook: [College Physics 2e](#) by [OpenStax](#). You can read this textbook online or download a PDF version for free. If you prefer a printed copy, you can buy one from the TCC bookstore for ~\$50.
- Basic scientific calculator with trigonometric functions. Since we will be taking quizzes and tests, a scientific calculator will be required and phones will not be allowed.
 - I recommend the [TI-30X IIS](#), which costs ~\$20.
- Notebook. Use one to take notes, follow along the solution of sample problems, and do the self-check work "paper-and-pencil" style. A virtual notebook on a tablet or laptop can work too.

- Scanner. You will be asked to submit on Canvas single PDF files containing work done on your notebook. You can use the free version of the [Genius Scan app](#), which creates single PDF files from multiple pictures and can send the result to your email.

Technology Required

- Familiarization with the Canvas Learning Management System. Please refer to the [Canvas Student Guide](#) for support in this matter.
- Computer literacy. You might be asked to install and/or use more than one type of web-browser (e.g., Firefox, Chrome, Edge, etc.); read and edit documents in MS Word or Google Docs; and take screenshots and attach them to e-mails, Canvas Inbox messages, or discussion boards.

This is a web-enhanced course meaning that many of our course materials will be made available online via Canvas. You will need regular access to a computer and Internet. While some assignments can be completed on your phone or tablet, most will be easier if done from a desktop or laptop computer.

COURSE LEARNING OUTCOMES

Learning outcomes are what you will know by the end of the course if you complete the assignments and participate in class activities. I have designed the class intentionally to meet these learning outcomes.

Upon successful completion of this course, the student will be able to:

1. Use the English and SI unit systems and convert between them.
2. Graphically, numerically, and conceptually demonstrate an understanding of the concepts of position, velocity, acceleration, forces, work, energy, and momentum including their interrelationships in 1 and 2 dimensions.
3. Describe and mathematically calculate both frictionless and frictional forces and how they cause static equilibrium, dynamic equilibrium, and accelerated motion.
4. Demonstrate an understanding of the relationships between graphs and equations and how they represent physical systems.
5. Perform lab experiments as part of a lab team and write group lab reports which clearly communicate the results of those laboratory activities using proper grammar, spelling, and organization.
6. Demonstrate an ability to solve both conceptual and mathematical problems.
7. Use physics vocabulary correctly in context.
8. Use proportional reasoning and unit analysis to identify possible solutions to problems.
9. Approach problems in an organized manner by a) modeling the problem, b) visualizing the problem with pictorial, physical, and graphical representations, c) developing a mathematical representation, and d) assessing the solution.
10. Discriminate between relevant and irrelevant information.
11. Use logical reasoning to quickly and correctly evaluate whether laboratory data collected from various sources (including technology) is valid or invalid.

PROFESSOR AND STUDENT EXPECTATIONS

Chosen Names and Pronouns

In this course, we will support each student's personal gender pronoun use and self-identification. Class and Canvas rosters are provided with each student's legal name of record. Please advise us of your personal name and pronouns so that we, as a class, can address you properly (we can do this using a sign-in page on the first day of class). As the course includes group work and in-class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect.

Professor Expectations

As your professor, I will work to create an atmosphere that will encourage and support your learning of course concepts. As such, objectives for which I will strive to meet include to:

- Get to know you and what your goals are for this class.
- Maintain a safe and supportive learning environment.
- Administer fair and equitable policies and procedures to all students.
- Provide a schedule of activities that is clear and communicate changes on Canvas.
- Return assignments within one week after the stated due date.
- Answer messages within 2 business days.
- Provide feedback and comments that are thorough and meaningful.
- Be available for students during my office hours and by appointment and inform students of any changes to my office hours on Canvas.
- Equip students with general skills applicable to multiple career paths.

Student Expectations

- **Engage:** Read the textbook and attend the in-person lectures when you can. Ask relevant questions, take notes, and work cooperatively with other students. Watch the lecture recordings whenever you miss an in-person session.
- **Check Canvas:** Assignments and other assessments are in Canvas. Check Canvas at least three times per week to ensure you complete work on time and understand instructions.
- **Respect others:** Behave with respect toward each other including other students and your professor. Refrain from profane language or inappropriate/unrelated remarks.
- **Communicate with me:** Keep me updated of any circumstances that will not allow you to complete your work on time. I am here to help you learn and can be flexible if something unexpected comes up in your life.

- **Self-Advocacy:** Seek out resources you need to be successful. There are many resources available to help you succeed at TCC, for example the Writing and Tutoring Center, Access Services, and Counseling.

If there is a matter of concern during this quarter, we will use WA State's [Standards for Student Conduct](#) to frame our discussion. For more information on TCC policies related to student etiquette, please refer to the [TCC Classroom Standards and Culture](#) webpage.

Recommended Study Habits

As this is a six-credit class, you can reasonably expect an average of 12 hours of reading/classwork each week. Before engaging with graded activities, read the relevant chapter sections and attend their associated lectures. I have tried to ensure that the workload is evenly distributed throughout the class, but if you find you have less than the normal amount of work one week, I suggest meeting with a classmate and/or going to the tutoring centers on campus to review the concepts. Students who do well in this class are able to connect concepts within the class and beyond the class to their other classes and their personal experiences. The more time you spend building connections with the class material to other areas of your life, the better!

Communication Policy

The best ways to communicate with me are by email and via Canvas Inbox, which I check regularly. You can send me messages at any time. My goal is to respond to messages within 48 hours during weekdays. On weekends and holidays, it might be a little longer than that.

Please set Canvas so that it sends you a message when I make a comment on your work. To do this, go to Canvas>Account>Notifications>Course Activities>Submission Comment. Click on the check mark for immediate notification to your home email or text, depending on what you prefer. You may also want to consider the other possible notifications and see what you would like to receive.

STRUCTURE OF THE COURSE

Course Outline

All students will meet twice a week in the big lecture room (Bldg. 15, Rm. 301), where we will introduce physics topics in a logical sequence. This lecture time will be a constant mixture of short traditional lecturing, active-learning exercises (in-class multiple choice questions), and sample problem solutions. Important announcements will also be made on these days, often at the beginning of the class period. Everyone will also meet once a week for an additional 50-minute period. Most of these days will be used for quizzes, although the first few minutes could be occasionally used for quick reviews. Lab meetings will generally begin with a quick review of the most important instructions, but students will be expected to be able to run the experiments without any major guidance from the beginning because detailed instructions will be provided in pre-lab videos.

Self-Checks/Homework

There will be Self-Check assignments (homework) every week containing a set of problems that you can solve using any resource provided to you (textbook, lectures) or created by you (notes, reports, etc.) You are encouraged to collaborate with classmates on these assignments and/or receive help from our

tutors at TCC, or myself. Your work will be automatically checked by the Canvas system and you will have an unlimited number of attempts to ensure you understand most if not all solutions to the problems posted. A self-check assignment will be marked complete (by you) once you have obtained correct answers for every problem in the set at least once and you can demonstrate satisfactory understanding of their detailed solutions.

The purpose of the homework assignments is to give students an opportunity to practice the concepts discussed in class. Thus, what's important is that you complete them the best you can. Naturally, you will be given more credit if you answer correctly all questions on the first try, but the penalties are very low if you make a few mistakes. Homework accounts for 10% of your grade in this course.

Quizzes and Exams

Quizzes are intended to prepare you for the exams. You will have up to 50 minutes in class to work on each one of them. There will be 8 quizzes in the quarter, on the dates indicated in our Course Calendar, and they cannot be made up. Quizzes account for 10% of your grade in this course. There will be a Midterm Exam and a Final Exam, each worth 20% of your grade in this course. Exams will take questions from previous quizzes.

Laboratory

Seven laboratory experiments will be conducted in this course. Your lab grade will be assigned primarily on the reports that you will write in collaboration with the other members of your group as well as your individual pre-lab predictions. A small percentage of your lab grade will depend on turning in your lab contract and mid-quarter and final evaluations on time. The total lab grade itself accounts for 30% of your grade in this course. Separate documents explaining the guidelines for lab reports will be provided on Canvas. If you do not attend a lab, you will not be allowed to turn in predictions, but you can contribute to the report write up. Lab handouts for this course will be available on Canvas. Prior to coming to the lab, you should open the lab handout, view the prelab lecture recordings, and complete the prelab prediction questions, which will be turned in before the beginning of lab, individually, each for 1.5% of your end-of-quarter lab grade. You can identify which lab we are doing each week by looking at the Course Calendar below. Lab reports will be due about one week after the experiment is conducted, and each will be worth 12% of your end-of-quarter lab grade, except for the last two, which will be turned in as a worksheet at the end of the lab period, each for 7% of your end-of-quarter lab grade. Your first task as a lab group (once we form them) will be to write a lab contract (worth 1% of your end-of-quarter lab grade). This contract will be the agreement between you and your lab group members about the expectations you have for each other. Even though you will be receiving a group grade on lab reports, your lab partners will have the ability to influence whether your lab grade should be higher or lower than the group average due to your participation, as indicated in the lab mid-quarter and final evaluations (together worth 1% of your end-of-quarter lab grade). We will be using the Logger Pro software in the laboratory, which is available to TCC students by direct download from our Canvas website. It is highly recommended to have a copy of this software installed at home for use in data analysis.

GRADING

Grade Distribution and Scale

Table 1: Grade Distribution

Category	Total	Drop	%
Homework/Self Checks	18	3	10
Quizzes	8	1	10
Laboratory	7	0	30
Midterm	1	0	20
Final	1	0	20

Table 2: Grade Scale

Grade	Points
A	93-100
A-	90-93
B+	87-90
B	83-87
B-	80-83
C+	77-80
C	73-77
C-	70-73
D+	67-70
D	65-67
E	0-65

Late Work and Extra Credit

Late work will not be accepted, and no extra credit will be given to individual students. Your lowest 3 homework grades as well as your lowest quiz grade will be dropped. In this way, emergencies and occasional absences will not affect your grade in any significant way and you do not need to justify them. Due dates for homework, lab predictions, reports, and evaluations can be found on the Canvas website for the class. Homework and lab predictions must be turned in before the beginning of class for full credit. If you arrive late to class on a due date, you can turn in your work for 2/3 of the credit as soon as you arrive. Please do not work on any due assignments while you are in class; I will not accept them.

TENTATIVE CLASS SCHEDULE

Every attempt will be made to maintain this schedule, but schedule changes may occur during the quarter. Check Canvas for the most updated schedule and assignment due dates.

Table 2: Course Schedule

Topic	Chapter (Sections)	Week(s)
The Nature of Science and Physics	1 (1-3)	1
Kinematics	2 (1-8)	1-3
Two-Dimensional Kinematics	3 (1-4)	3-5
Dynamics: Force and the Laws of Motion	4 (1-7)	5-6
Further Applications of the Laws of Motion	5 (1-3)	7-8
Work and Energy	7 (1-6)	9-10
Momentum and Collisions	8 (1-5)	10-11

For important college-relevant dates, see the [TCC Academic Calendar](#) page.

TCC POLICIES AND PROCEDURES

TCC works hard to create a vibrant learning culture where you can succeed. Please refer to the [TCC Classroom Standards and Culture](#) page that support this important work. Tacoma Community College, its employees and its students adhere to a variety of policies. The major policies of the college are available on the [TCC Policies web page](#).

Classroom Concerns and Final Grade Appeal Process

If you have concerns about this class or how it is being managed or conducted, please try to address them by communicating directly with me first, whenever possible. If unable to resolve a problem that way, you may contact the Department Chair, Dr. Ivan Ramirez (e-mail: iramirez@tacomacc.edu). If needed, he can assist with information about additional steps including filing a grade grievance. Students who believe they have received a final course grade that has been awarded improperly or in an arbitrary or capricious manner may grieve or appeal the grade.

Academic Integrity

As stated on the [Administrative Process for Academic Dishonesty](#) page on TCC's website, "Students are expected to be honest and forthright in their academic endeavors. Cheating, plagiarism, fabrication or other forms of academic dishonesty corrupt the learning process and threaten the educational environment for all students." If I have a matter of concern in this regard, I will reach out to the student and have conversations with them to understand the motivation behind their actions and provide recommendations on how to get the best of our class without having to compromise their academic integrity. I will do my best to provide resources to help us circumvent any particular issue and thus avoid having to go through the process or reporting academic dishonesty. I will only follow the reporting process and apply penalties (informed to students on a case-by-case basis) if I am not able to communicate with them within a reasonable amount of time (a few days to a week).

LEARNER SUPPORT

Academic Support

Please check each of the following links to find out about opportunities for academic support, not only for our class, but also for your overall TCC experience.

- [Science, Engineering, and Math Tutoring Center](#)
- [Writing and Tutoring Center](#)
- [TCC Library](#)
- [Business Education Center](#)

Technical Support

The TCC [eLearning](#) Department has many resources available to support students. If you are experiencing a problem, call them for live phone support or visit the [TCC Support](#) for an extensive knowledge base and support ticketing system (login to the TCC Portal is required). You will find several tutorials to help you through computer tasks as well as specific Canvas functions.

Access Services

TCC is committed to ensuring access for students with disabilities in the online and physical learning environments. If you have already established approved disability accommodations with the [Access Services](#) office, please remember to request that your Accommodation Letter is sent to me. If you have a disability or health condition and have not yet established services, please contact the Access Services office at access@tacomacc.edu or by submitting the [New Student Application](#) located on their webpage to begin the process required to establish accommodations. Access Services can work with students remotely through a variety of different methods. Please refer to their [TCC Access Services Website](#) for more information.

Counseling

It's hard to focus on class work when you're feeling overwhelmed in other areas of your life. Free, confidential counseling is available for TCC students at the [Counseling Center](#). Their staff are trained to

help in areas such as grief and loss, stress, veteran concerns, test anxiety, gender and sexuality, drug and alcohol issues, career planning, parenting and relationships, depression or anxiety, suicide, and others.

Safety

We care about the safety of our campus and community and all of us are needed in order to create a safe and secure learning environment. Please review the full list of safety resources available to you, which are listed on our [TCC Ready website](#). Additionally, please watch [this brief video](#) to familiarize yourself with our general safety practices and [sign up for TCC Alerts!](#) to receive emergency notifications to your cell phone.

Additional Resources

During this quarter, you may encounter a need that goes beyond this class that affects your academic performance. We are here to help you be successful. You have access to great resources on campus and people ready to support you. Visit the [Academic Support & Resources](#) and the [Life Resources](#) pages on TCC's website to learn about some of these excellent resources.

SYLLABUS SUBJECT TO CHANGE

I reserve the right to change this Syllabus at any time because of a change in policy or adjustments because of schedule. If the Syllabus changes significantly for any reason, I will provide each student with a written Syllabus Addendum detailing the changes.