PHYS 1001

FOUNDATIONS OF PHYSICS I

Instructor: Jesse Heilman

How to address me: Dr/Prof Heilman

Gender Pronouns: (he/him/his) (learn more)

Email: Jesse.Heilman@carleton.ca

Note: If you have or question or would like to talk with me, you can send an email, visit me during student hours (see below), or approach me after lecture.

Phone: (613) 520-2600 ext. 8215 [E-mail is the best way to contact me]

Office Location: Room 3314 HP

Class Times: Tuesday & Thursday, 08:35am-09:55pm

Prerequisites: Before taking this course, you should have taken Grade 12 Mathematics: Advanced Functions and Grade 12 Mathematics: Calculus and Vectors or equivalent, plus one of MATH 1004 or MATH 1002 or MATH 1052 (the MATH course may be taken concurrently); or permission of the Physics Department. Grade 12 Physics is strongly recommended.

Website: https://brightspace.carleton.ca

Student Hours: TBD

What are 'Student Hours'?
Student hours are dedicated times through the week for the course instructor and TAs to meet with YOU. Pop in to introduce yourself, ask questions about the course, or discuss content from the course.

Note: If these If these times don't work for you, email me and we can arrange an alternate time to meet.

Welcome to PHYS 1001!

This course focuses on teaching you the basics upon which other, more complicated physics is based on. While learning equations and how to get the right answers for problems is important, this course also strives to begin to change how you think about the world around you. The reality of how world works is mysterious and beautiful, and it is necessary to think about it critically to develop deep understanding. Ask questions! Challenge your assumptions! Always remember: "Wisdom begins with, 'I do not know.'"

Calendar entry: This calculus-based course on classical mechanics covers kinematics, dynamics, gravitation, and oscillatory motion. This is a specialist course for students intending to take further courses in physics.
If you have not previously taken nor are currently enrolled in MATH 1002, MATH 1004, or MATH 1052, contact Professor Heilman immediately as they are necessary to be successful in this course.

Algonquin territory acknowledgement: We acknowledge that the land on which we gather and learn is the traditional and unceded territory of the Algonquin nation. You are invited to learn more, reflect on how you can support anti-racism and decolonization, and take action. https://carleton.ca/indigenous/

Course delivery: The course will consist of a mix on synchronous and asynchronous activities. Scheduled class time will consist synchronous, **in-person** meetings where we will discuss the course material in a peer instruction style format. This

interactive style of course delivery relies heavily on prior exposure of students to the fundamentals of the concepts under discussion. Thus, asynchronous reading assignments will be given in advance of each class using the Perusall (https://www.perusall.com/) platform. Students will annotate, comment, respond to and upvote other comments made by their classmates in a social model of pre-class reading. The most commented and discussed points during the reading assignments will be used to guide the classroom discussion in the following class period. The in-person sessions are intended to synthesize the material covered in the asynchronous activities and teach students to apply concepts and analyze problems. It is highly recommended that you attend these sessions except in the case of an emergency.

Lecture recording: Given the nature of the class delivery, asynchronous recordings of the class periods are ***not*** a useful tool, and ***no*** recordings will be taken. I will disseminate the example problems covered in class via Brightspace.

Important Dates: Please see https://calendar.carleton.ca/academicyear/ for a full list of important dates for the term. An especially important date November 15th which is the last day for withdrawal from the course without receiving a 'WDN' on your transcript.
A calendar of important dates for assignments and exams is available through the course's Brightspace page.

Inclusive teaching statement: Science is for everyone. I am committed to fostering an environment for learning that is inclusive for everyone regardless of gender identity, gender expression, sex, sexual orientation, race, ethnicity, ability, age, class, etc. All students in the class, the instructor, and any guests should be treated with respect during all interactions. It is my hope that our class will support diversity of experience, thought, and perspective. I will continually strive to create inclusive learning environments and would therefore appreciate your support and feedback. I welcome emails or in-person communications to let me know your preferred name or pronoun. Please see the Faculty of Science Equity, Diversity, and Inclusion (EDI) statement: https://science.carleton.ca/about/edi/

Learning Materials

Text

Fundamentals of Physics, 12th Edition, Halliday and Resnick

- You will need to purchase a copy of the e-book text from Perusall. You will use this text for PHYS1002 also, so the perpetual license is recommended.
- Hardcopies can be purchased

Laboratory Notebook

Purchase a hardcover lab notebook with alternating graph pages from either the Bookstore in the University Center or Science Stores in the Stacie building, room 118

Internet capable device (smartphone, laptop, tablet, etc)

We will use Poll Everywhere during class, and you will need an internet enabled device to participate.

WileyPlus

Through purchasing the textbook, you gain access to the WileyPlus service from the textbook publisher. This service is great for providing practice problems on subjects you wish to study as well as videos of fully worked out problems for extra study.

Assessment in this Course

Research about learning strongly suggests that the most important factor in learning is doing the work of reading, writing, recalling, practicing, synthesizing, and analyzing. Learning happens best when people actively engage material on a consistent basis, and that is why I have high standards in this course. I am confident that, with appropriate effort, you all can meet those standards.

I also make an effort to reduce unintentional bias in grading by, for example and when possible, grading assignments one question at a time (grading all of question 1 before grading any of question 2), grading anonymously, and using rubrics.
All marks will be posted on Brightspace. If you think there is an error in the Brightspace gradebook, contact me immediately as it will be used as the official record for your marks.

Grade Breakdown

COMPONENT	GRADE VALUE
PRE-CLASS READING	10%
WEEKLY ASSIGNMENTS	20%
LAB EXPERIMENTS	25%
EXAMS	30% (10% midterm, 20% final)
TUTORIALS	15% (7.5% pre-tutorial quiz, 7.5% tutorial participation)

Weekly Assignments

Weekly homework assignments will be distributed roughly each week throughout the term and will generally be due 1 week after distribution. They are designed to give you an opportunity to exercise technical and critical thinking skills in an asynchronous environment. Begin thinking about and working on your assignments as soon as you finish the pre-class reading. Homework assignments submitted after the due date will not be accepted.
Students are permitted to discuss concepts and strategies related to solving the assignments; however, the work you turn in must be your own. The assignments are a critical part of the course and working through the problems yourself is essential to learn the material. Your homework solutions should be thorough, self-contained, and logical, with all steps explained. Assignments will be posted on Brightspace. Solutions may be hand-written or type-set so long as they are easily understood and marked. Help us to give you marks by ensuring your work is legible and easy to follow. Sometimes this means rewriting your solutions once you complete the problem the first time so that your logic is easy to follow. Complete the assigned problems and submit a digital copy, as a single PDF file, of them on Brightspace before the due date. Ensure that your uploaded assignment is legible and your writing, if you hand wrote the solutions, is dark enough to easily read.

Laboratories and Tutorials

There are six labs to be completed as shown on Brightspace (see your lab instructor for more details).
On five of the weeks where there is no lab to complete, the laboratory time will be given as tutorial sessions where students will complete problems with assistance of the lab staff and TAs. Ahead of these Tutorials, you must complete a short quiz on Brightspace. The results of these quizzes will help the TAs guide the topics that need focus during the Tutorials. You will be given marks for the completion of the pre-quiz as well as participation in the Tutorials.

Progressive Formula Sheet Cards

Each week during Thursday's class, you will have the opportunity to turn in a single 3"x5" index card filled with notes on what you thought was important in the week's material. You will have these cards returned to you for the midterm and final exams to be used as notes for the exam.

Midterm exam

A Midterm exam will be given on Tuesday October 19th during normal class time and will cover material discussed in class up to that point.

Final exam

The final exam will take place during the final exam period and will be administered in-person.

Community Guidelines

The following values are fundamental to academic integrity and are adapted from the International Center for Academic Integrity*. In our course, we will seek to behave with these values in mind:

	As students, we will…	As a teaching team, we will…
Honesty	• Honestly demonstrate our knowledge and abilities on assignments and exams • Communicate openly without using deception, including citing appropriate sources	• Give you honest feedback on your demonstration of knowledge and abilities on assignments and exams • Communicate openly and honestly about the expectations and standards of the course through the syllabus, and with respect to assignments and exams
Responsibility	• Complete assignments on time and in full preparation for class • Show up to class on time, and be mentally/physically present • Participate fully and contribute to team learning and activities	• Give you timely feedback on your assignments and exams • Show up to class on time, and be mentally & physically present • Create relevant assessments and class activities
Respect	• Speak openly with one another, while respecting diverse viewpoints and perspectives • Provide sufficient space for others to voice their ideas	• Respect your perspectives even while we challenge you to think more deeply and critically • Help facilitate respectful exchange of ideas
Fairness	• Contribute fully and equally to collaborative work, so that we are not freeloading off others • Not seek unfair advantage over fellow students in the course	• Create fair assignments and exams, and grade them in a fair, and timely manner • Treat all students equitably
Trust	• Not engage in personal affairs while on class time • Be open and transparent about what we are doing in class • Not distribute course materials to others without authorization	• Be available to all students when we say we will be • Follow through on our promises • Not modify the expectations or standards without communicating with everyone in the course
Courage	• Say or do something when we see actions that undermine any of the above values • Accept a lower or failing grade or other consequences of upholding and protecting the above values	• Say or do something when we see actions that undermine any of the above values • Accept the consequences (e.g., lower teaching evaluations) of upholding and protecting the above values

[2] This class statement of values is adapted from Tricia Bertram Gallant, Ph.D.

Online Community Expectations for Social Platforms

With the growing use of social platforms (e.g., Discord) on campuses, it is important to keep in mind that university codes of conduct still apply to the behaviours of students online. Please be considerate and respectful while engaging with peers and remember that we are all humans, and that your words matter. If any student witnesses or experiences harassment, I encourage you to reach out to me. Alternatively, you can contact Ombuds Services or Carleton Equity and Inclusive Communities.

Online communities can be highly beneficial to students and can help to facilitate learning within the course. I encourage people to ask questions, learn from one another, and have open discussions about class material. That said, any acts of academic misconduct (i.e., cheating) will not be tolerated and will result in serious consequences ranging from a grade reduction to expulsion (see academic integrity violations).

- Examples of appropriate peer-to-peer sharing/learning vary from course to course. In this course appropriate peer-to-peer sharing includes: identifying the proper formula to use, identifying an incorrect or missing step in a person's work, brainstorming potential reasons behind a concept, suggesting helpful sites and videos for learning a concept, posting your own work showing only a specific step or process for illustrative purposes (note: this is very different from posting your work and solution for others to simply copy)
- Examples of unacceptable peer-to-peer sharing: Posting or sharing the answers, indicating which answers are correct on assignments, sharing links to solutions, posting your own complete work for a question/solution

I ask that you read and follow the list of guidelines below (moderators may re-post, if helpful):

Feeling Sick?

If you feel very sick (e.g., fever, chills, stomach upset) do not come to class or campus. Send an email to either myself or your laboratory instructor to make arrangements for any important elements of the course you may have missed. It is also a good idea to contact your classmates to help you to catch up with anything you may have missed.

Mental Health

If you are struggling, please do not hesitate to reach out. I am happy to listen, and/or direct you to resources that might help. In terms of class, if you need extra help or missed a lesson, don't stress! Email me and we will set a time to meet. I'll work with you, I promise. Remember that Carleton also offers an array of mental health and well-being resources, which can be found here.

University Policies

In accordance with the Carleton University Undergraduate Calendar Regulations, the letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100	B+ = 77-79	C+ = 67-69	D+ = 57-59
A = 85-89	B = 73-76	C = 63-66	D = 53-56
A- = 80-84	B- = 70-72	C- = 60-62	D- = 50-52

F = <50
WDN = Withdrawn from the course
ABS = Student absent from final exam
DEF = Deferred
FND = (Failed, no Deferred) = student could not pass even with 100% on final exam

Academic Accommodations, Regulations, Plagiarism, Etc.

Carleton University is committed to providing access to the educational experience in order to promote academic accessibility for all individuals.
Academic accommodation refers to educational practices, systems and support mechanisms designed to accommodate diversity and difference. The purpose of accommodation is to enable students to perform the essential requirements of their academic programs. At no time does academic accommodation undermine or compromise the learning objectives that are established by the academic authorities of the University. More information can be found at:
https://students.carleton.ca/course-outline/
University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university's website, here:
https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. For more details, visit the Paul Menton Centre website.

Addressing Human Rights Concerns

The University and all members of the University community share responsibility for ensuring that the University's educational, work and living environments are free from discrimination and harassment. Should you have concerns about harassment or discrimination relating to your age, ancestry, citizenship, colour, creed (religion), disability, ethnic origin, family status, gender expression, gender identity, marital status, place of origin, race, sex (including pregnancy), or sexual orientation, please contact the Department of Equity and Inclusive Communities at equity@carleton.ca.

Religious Obligations

Please contact me with requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the Student Guide to Academic Accommodation (PDF, 2.1 MB).

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: https://carleton.ca/sexual-violence-support/

Accommodations for Missed Work

Carleton recognizes that students may experience unexpected, temporary incapacitation (i.e., illness, injury, or extraordinary circumstances outside of a student's control). As a result, Carleton has put into place a protocol for students to apply for accommodations using a self-declaration form in the event of missed work. The form can be found at:
https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf Note that these forms should be used for short-term concerns related to missed work; if you are experiencing chronic, ongoing challenges which necessitate a broader solution, I recommend reaching out to the Paul Menton Centre and/or the Care Support team.

For Pregnancy

Please contact me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the Student Guide to Academic Accommodation (PDF, 2.1 MB).

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the Senate Policy on Accommodation for Student Activities (PDF, 25KB).

Academic Integrity

Academic Integrity is upholding the values of honesty, trust, respect, fairness, responsibility, and courage that are fundamental to the educational experience. Carleton University provides supports such as academic integrity workshops to ensure, as far as possible, that all students understand the norms and standards of academic integrity that we expect you to uphold. Your teaching team has a responsibility to ensure that their application of the Academic Integrity Policy upholds the university's collective commitments to fairness, equity, and integrity.
(Adapted from Carleton University's Academic Integrity Policy, 2021).

Examples of actions that do not adhere to Carleton's Academic Integrity Policy include:

- Plagiarism
- Accessing unauthorized sites for assignments or tests
- Unauthorized collaboration on assignment and exams
- Using artificial intelligence tools such as ChatGPT when your assessment instructions say that it is not permitted

Please review the checklist linked here to ensure you understand your responsibilities as a student with respect to academic integrity and this course.

Sanctions for Not Abiding by Carleton's Academic Integrity Policy

A student who has not upheld their responsibilities under Carleton's Academic Integrity Policy may be subject to one of several sanctions. A list of standard sanctions in science can be found here.
Additional details about this process can be found on the Faculty of Science Academic Integrity website. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy. The Policy is strictly enforced and is binding on all students.

Student Rights & Responsibilities

Students are expected to act responsibly and engage respectfully with other students and members of the Carleton and the broader community. See the 7 Rights and Responsibilities Policy for details regarding the expectations of non-academic behaviour of students. Those who participate with another student in the commission of an infraction of this Policy will also be held liable for their actions.

Student Concerns

If a concern arises regarding this course, **your first point of contact is me**: Email or drop in during student hours and I will do my best to address your concern. If I am unable to address your concern, the next points of contact are (in this order):

Note: You can also bring your concerns to Ombuds services.

Assistance for Students

Academic and Career Development Services: http://carleton.ca/sacds/
Writing Services: http://www.carleton.ca/csas/writing-services/
Peer Assisted Study Sessions (PASS): https://carleton.ca/csas/group-support/pass/
Math Tutorial Centre: https://carleton.ca/math/math-tutorial-centre/
Science Student Success Centre: https://sssc.carleton.ca/