PHYS1007A/PHYS1107A/BIT1203A (Fall 2025)

Elementary University Physics 1/Introductory University Physics I /Newtonian Physics

Course Instructor: Prof. Manuella Vincter

Email: vincter@physics.carleton.ca

Office Location: Room 2458, Herzberg Building

Note: If you have a question or would like to talk with me, you can send an email, visit me during student hours (see Brightspace), or approach me after the lecture. **All email communications must be done from your Carleton University account.**

Student Hours: see Brightspace for details

Class Location: Please check Carleton Central for the room location.

Class Times: Mon&Wed 8:35am-9:55am

Prerequisites: (i) Grade 12 Mathematics: Advanced Functions or equivalent, or MATH 0107 (may be taken concurrently); or (ii) Grade 12 Mathematics: Calculus and Vectors or equivalent, or MATH 1007 (may be taken concurrently; or (iii) permission of the Physics Department.

Preclusions: Precludes additional credit for BIT 1002, PHYS 1001, PHYS 1003, PHYS 1007/PHYS 1107/ BIT 1203 (depending on the course you are enrolled in)

Department/Unit: Physics

Lab/tutorial supervisor:
Tamara Rozina (Tamara.Rozina@carleton.ca)

Lectures three hours a week; laboratory or tutorial an additional three hours per week

NOTE: Students registered in PHYS1107 do not participate in the laboratories but must participate in the tutorials.

The prof reserves the right to make changes to this course outline. Any changes will be announced in Brightspace.

Welcome to PHYS1007A/PHYS1107A/BIT1203A! I am delighted to be your prof this semester. I will continually strive to create inclusive learning environments and would therefore appreciate your support and feedback. Please feel free to contact me via email or in person to let me know about any experiences you have had related to this class that have made you feel uncomfortable.

Land Acknowledgement: We, the people of the Faculty of Science at Carleton University, acknowledge that our campus is located on the traditional, unceded territories of the Algonquin Anishinabeg people. Miigwetch for your hospitality and stewardship of this territory and the teachings that come from it. We are grateful for this land, the air that we breathe, and the water that sustains us all as well as for the animals, plants and other living beings: these enable us to research, teach, mentor, support, study, and learn. We recognize our responsibility to our natural environment and to reconciliation with Indigenous peoples.

Learning Material(s) and Other Course/Lab-Related Resources

Learning Material	Options for Purchasing	Approximate Cost
Physics (Traditional Motion-First Approach), 2025 Release, Alan Giambattista, McGraw Hill, ISBN: 978-1-266-90250-5	Carleton University Bookstore. Online version at McGraw Hill	McGraw Hill and CU Bookstore printed version: $119.95. CU Bookstore ebook for 180 days: $69.00

About using an older edition of the textbook: The physics content doesn't change much from one edition to the next. However, older versions may assign different section / table / figure numbers. As I will be referring to such materials by their numbers as given in the most recent edition, using an older edition may result in your accessing the wrong information. It is therefore recommended that you get the most recent edition.

About the use of calculators: A non-programmable scientific calculator with built-in scientific functions (like e.g. trig functions, square-root) that is unable to connect to any external network like the internet is needed. **Using the calculator application on your phone or a programmable calculator is not allowed for exams** (programmable calculators can store a sequence of keystrokes/formulas for later retrieval and execution). However, calculators that store numbers in one or more memories, or execute procedures that cannot be modified by the user are ok to use. **You should use the same calculator for the whole semester so that you get used to using it for your final exam.**

Late and Missed Work Policies

Please see each section below for the policies on late or missing work.

Course level learning outcomes:

This non-calculus-based course is designed to provide a solid foundation in mechanics, properties of matter, and heat. Primarily intended for students not intending to pursue dedicated studies in physics.

With this course, you will discover about how the world around you works! You will learn how to think critically about problems and develop problem-solving skills to resolve them. Acquiring such tools will benefit you in whatever walk of life you choose to pursue! "Practice makes perfect", or so the saying goes. Learning about physics is no exception. I will teach you the principles and solve many physics problems for you in class, but you can only get better at it by taking the time it takes outside the classroom to review the material and try solving new problems on your own or with your classmates.

Course website: Brightspace will be the main way that I will communicate to you information about quizzes, assignments, etc… I will also post my class notes there. Check it out regularly!

Topics Covered

(The timing given is my aspiration. It is subject to change.)

Lecture #	Date	Some highlights of topics/content	Readings/Prep for Class
1	W Sep 3	Scientific notation, units, significant figures, dimensional analysis	Outline, 1.1-1.9
2	M Sep 8	Position, displacement, velocity, acceleration	2.1-2.3
3	W Sep 10	Motion along line constant acceleration, kinematics, free fall	2.4-2.6
4	M Sep 15	Vectors, velocity, acceleration, motion in a plane	3.1-3.5
5	W Sep 17	Motion in a plane, forces, Newton's laws	3.5-3.6, 4.1-4.3
6	M Sep 22	Gravitation, contact forces, tension	4.4-4.7
7	W Sep 24	Applications, reference frames, apparent weight	4.8-4.12
8	M Sep 29	Uniform circular motion, radial acceleration, curves	5.1-5.3
9	W Oct 1	Orbits of planets, nonuniform circular motion, angular acceleration, apparent weight	5.4-5.7
10	M Oct 6	Conservation of energy, work, kinetic energy, gravitational potential energy	6.1-6.4
11	W Oct 8	Gravitational potential energy, Variable forces, elastic potential energy, power	6.5-6.8
12	W Oct 15	Momentum, impulse, conservation of momentum	7.1-7.4
13	M Oct 27	Centre of mass, collisions in one & two dimensions	7.5-7.8, 8.1
14	W Oct 29	Rotational kinetic energy and inertia, torque, work from torque, equilibrium	8.1-8.5
15	M Nov 3	Rotational Newton's 2nd law, angular momentum, rolling	8.5-8.9
16	W Nov5	Pressure, Pascal's effect, gravity on a fluid, buoyant force, flow, Bernoulli	9.1-9.8
17	M Nov 10	Bernoulli, viscosity, tension	9.8-9.11
18	W Nov 12	Deformation, Hooke's law	10.1-10.4
19	M Nov 17	Simple harmonic motion, pendulum, oscillations	10.5-10.10
20	W Nov 19	Waves&energy, longitudinal & transverse waves, superposition	11.1-11.7
21	M Nov 24	Refraction, refraction, interference, diffraction, standing waves, sound waves	11.8-11.10, 12.1-12.2
22	W Nov 26	Standing waves, human ear, doppler	12.3-12.4, 12.6, 12.8
23	M Dec 1	Temperature, thermal expansion, ideal gas law	13.1-13.5
24	W Dec 3	Heat	14.1-14.4
25	F Dec 5	Catch-up, summary	

Important dates and deadlines can be found here, including class suspension for fall, winter breaks, and statutory holidays.

Pre-Class Reading Quizzes and Homework Assignments

Pre-class reading quizzes and assignments are an important part of the lecture, used to evaluate your understanding of the lecture material. These are both completed using Brightspace. To access these, you need a computer connected to the internet running a compatible web-browser. If you are unable to access Brightspace or need help with your computing account, please contact the ITS Service Desk: its.service.desk@carleton.ca

Pre-Class Reading Quizzes: Read the appropriate sections in the textbook. Then, answer the qualitative questions. Note that there are no second chances with the pre-class reading quiz, so you need to be sure of your facts before starting it. Quizzes typically require less than 20 minutes to complete. Due dates will be announced in Brightspace. Approximately weekly.

Homework Assignments: These are assigned after having covered the material in class. You will be asked to answer a few questions. You have two chances to complete the assignment. Your final mark is based on the highest score achieved. Be ready with your calculator, pens, and paper as you will need to do some old-fashioned scribbling to solve these problems. Note that on the second attempt a different set of questions will be randomly assigned. Due dates will be announced in Brightspace. Assignments should typically require less than 90 minutes to complete. Approximately weekly.

Helpful advice on doing the Homework Assignments: In doing these assignments, you may be asked to answer as a decimal (i.e. like 0.581) or in scientific notation (i.e. like 1.23×10^{1}). If not told otherwise, give three significant figures. To get the answer correct you must be within ±5% of the correct numerical answer as you would get from entering all the numbers into a calculator. If you do not give your answer with at least three significant figures, your answer may be outside of this 5% threshold and may therefore be marked as incorrect. Answers of this sort will not be eligible for reassessment by the professor. Ensure to always take careful note of the units answer should be given in. Typically, it is expected that the answer will follow SI units (e.g. m, s, J); however, there are occasions in which non-standard units will be required for specific questions. Generally, these instances will be noted in the question itself, e.g. “Express your answer in km”. Also, units are not to be entered with the numerical answer!

Calculating of marks for pre-class reading quizzes and homework assignments: It is recognised that there will occasionally be problems in accessing Brightspace/the internet. To have them work properly requires a long chain of hardware and software to operate correctly. In recognition of this and also because there is an initial learning curve that must be overcome, the final mark in both the pre-class reading quizzes and weekly assignments will be calculated based on the 10 best quizzes and 10 best assignments. For the assignments, plan to use your first attempt as your best one, in case you experience technical difficulties during your second attempt. No additional attempts are possible beyond the two given for assignments (so don’t waste your first chance to do the work!).

Late work policy: It is not possible to hand in late pre-class reading quizzes and assignments. They will automatically close at the appointed time in Brightspace.

Laboratories

NOTE: Students in PHYS1107A do not participate in the laboratory

Labs start the week of **September 15, 2025**.
All the experiments will be held in-person in room **HP 4160**.
Information about the labs can be found on the LAB Brightspace page:
Merge BIT1203A1:PHYS1007L1-7:PHYS1107A1-6E Physics I (LAB:TUT) Fall 2025.

It is imperative that all students attend the first lab. You must attend only the section that you are registered in. If you missed a laboratory session, you must contact the Lab Coordinator, Ms. Tamara Rozina (tamara.rozina@carleton.ca) **immediately**. A make-up session may be arranged at the end of term in these cases. Make-up sessions are reserved for emergency situations only and no more than one session per student is possible. Failure to reach out regarding a missed laboratory session will result in a grade of zero for the experiment in question.

Students who are repeating the course might be exempt from the Lab. You are not automatically given a lab exemption – you must apply for it no later than **September 19, 2025**. Lab exemptions will be considered on a case-by-case basis at the discretion of the Lab Coordinator.

The grade for every lab will be based on a **report**. All reports count toward your total lab grade for the course. **No grade will be dropped.**

Late work policy: All reports must be submitted by the appointed time: **1 week** after the start of the lab session. The penalty for a late lab report is **20% up to the End Date** specified on Brightspace for every lab section report submission. It is the student's responsibility to check when the End Date is for each report. **No reports will be accepted for grading past their End Date.**

Please see the Lab Policy document available on the LAB Brightspace page for further details regarding the labs.

Lab Schedule

Lab #	Title	Deadline for report	Weight (%)	Week of
1	Reaction Time	1 week	10	September 15, 2025
2	Density	1 week	15	September 29, 2025
3	Spring Constant	1 week	25	October 13, 2025
4	Atwood's Machine	1 week	25	November 3, 2025
5	Simple Pendulum	1 week	25	November 17, 2025

Tutorials

There will be a tutorial on each alternating week with the labs. A set of tutorial problems will be posted on the lab/tutorial Brightspace website at least a week before the tutorial session. Students should attempt to solve all these problems to prepare for the tutorial.

- At the start of the tutorial session students will individually complete a multiple-choice quiz consisting of 4 questions. This is open book and lasts for 15 minutes.
- The next part of the tutorial (lasting around an hour) will be devoted to students working in groups to answer questions provided in advance on specific subject material. This period is also meant to give students opportunity to get additional help on topics presented in lectures. The TAs will demonstrate solving example problems and answering questions about the tutorial problem set.
- During the last hour of the tutorial will be a test consisting of two long-answer problems. Closed book means that you can use the formula sheet (provided) and a scientific calculator. No other aids are permitted.

The grade for this test and the 4 multiple choice questions will be combined to provide the final Tutorial Test grade for each of the 5 tutorial sessions this semester. The 4 highest test grades will be used to determine the final Tutorial Test score.

Note that if you arrive late for the tutorial, you will miss the multiple-choice quiz and forfeit marks. There are no retakes possible.

Students must attend the tutorial session only in the lab section they are registered in. The final grade for tutorials is based on best 4 out of 5 sessions. If a student misses a session, then this session will automatically be dropped and the other 4 will count towards the final grade. If a student has to miss a second session, they must reach out to the Lab Coordinator, Ms. Tamara Rozina (tamara.rozina@carleton.ca) immediately to discuss possible options.

Tutorial Schedule

Tutorial #	Weight (%)	Week of
1	25	September 22, 2025
2	25	October 6, 2025
3	25	October 27, 2025
4	25	November 10, 2025
5	25	November 24, 2025

Topics of the tutorial will be announced in Brightspace.

After your tutorial tests are returned, you are expected to keep them at least until the end of term. Please verify their marks entry on Brightspace and bring any clerical errors to our attention as soon as you can during the term.

Assessments

Mid-term exam: There is no mid-term examination. We regard the five tutorial tests as a way of providing feedback and guidance on your performance. If you do not perform to your own satisfaction on a tutorial test, it is imperative to discuss this with your lecturer during student hours or by email. Do not leave this consultation until the end of the course. Effective intervention and assistance are best applied at the beginning of term.

Final exam: The final examination will be scheduled during the regular December examination period at the end of the term December 8 – 20, 2025. It is the responsibility of the student to be present during this period; in particular, holiday travel arrangements must not be made before the examination schedule is known. More information about the final exam will be posted in Brightspace in due time.

Grade Breakdown for PHYS1007A/BIT1203A:

COMPONENT	GRADE VALUE
PRE-CLASS READING QUIZZES (BEST 10)	10 %
ASSIGNMENTS (BEST 10)	15 %
TUTORIALS (BEST 4)	15 %
LABORATORIES	35 %
FINAL EXAM	25 %
TOTAL	100 %

Grade Breakdown for PHYS1107A:

COMPONENT	GRADE VALUE
PRE-CLASS READING QUIZZES (BEST 10)	15 %
ASSIGNMENTS (BEST 10)	25 %
TUTORIALS (BEST 4)	25 %
FINAL EXAM	35 %
TOTAL	100 %

Passing conditions:

- An overall grade of greater than 50% is needed to pass the course.
- PHYS1007A/BIT1203A: A grade of at least 40% is needed in both “Theory” and Laboratory, where “Theory” includes pre-class quizzes, homework assignments, tutorial tests, and the final exam. Achieving more than 40% but less than 50% in either

Theory or Laboratory while achieving 50% or more overall will translate into a grade of D-.

- The final exam must be attempted to pass the course, even if you manage to achieve 50% overall without it.

Students are expected to attend all lectures, labs (but not for PHYS1107), and tutorials, and complete all lab reports and tests.

Deferred Exams: Deferred Exams are generally only granted to students who cannot take the regularly scheduled exam due to serious illness or death of a family member. Information on the deferral process is provided at https://carleton.ca/registrar/special-requests/deferral/ The Deferred Exam replaces only the Final Exam portion of the marks and students must be eligible to pass the course by having completed satisfactory term work (at least 40% of the total grade excluding the final exam).

Academic Accommodations and Regulations

Carleton is committed to providing academic accessibility for all. You may need special arrangements to meet your academic obligations during the term. Accommodation request processes are outlined on the Academic Accommodations website.

Statement on Chat GPT/Generative AI usage

Students may use AI tools for basic word processing and text formatting. It is not necessary to document the use of AI for these purposes. **AI tools should not be used to find solutions to pre-class quizzes and homework** assignments as performing the work yourself is how you learn physics. If you have questions about a specific use of AI, please consult your me. As our understanding of the uses of AI and its relationship to student work and academic integrity continue to evolve, students are required to discuss their use of AI in any circumstance not described here with me to ensure it supports the learning goals for the course.

Statement on Academic Integrity

Students are expected to uphold the values of academic integrity, which include fairness, honesty, trust, and responsibility. Examples of actions that compromise these values include but are not limited to plagiarism, accessing unauthorized sites for assignments or tests, unauthorized collaboration on assignments or exams, and using artificial intelligence tools such as ChatGPT when your assessment instructions say it is not permitted.

Misconduct in scholarly activity will not be tolerated and will result in consequences as outlined in Carleton University's Academic Integrity Policy. A list of standard sanctions in the Faculty of 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 abide by Carleton University's Academic Integrity Policy.

Student Rights & Responsibilities

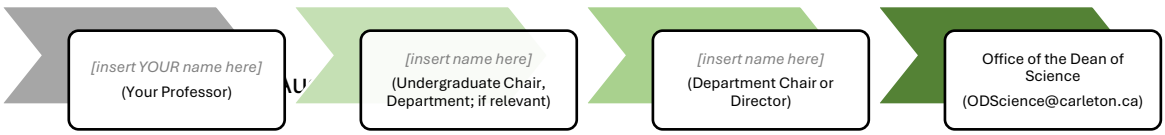
Students are expected to act responsibly and engage respectfully with other students and members of the Carleton and the broader community. See the Rights and Responsibilities Policy for details regarding the expectations of non-academic behaviour of students. Those who participate with another student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

Intellectual Property

All course materials are protected by copyright and remain the intellectual property of their respective author(s). Students registered in the course may take notes and make copies of course materials for their own educational use only. Students are not permitted to reproduce or distribute lecture notes and course materials publicly for commercial or non-commercial purposes without express written consent from the copyright holder(s).

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):



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
DEF = Deferred

Assistance for Students

Career Services: https://carleton.ca/career/
Centre for Student Academic Support: https://carleton.ca/csas/
Math Tutorial Centre: https://carleton.ca/math/math-tutorial-centre/
Science Student Success Centre: https://sssc.carleton.ca/

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 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
- Examples of unacceptable peer-to-peer sharing: Posting or sharing the solution or answer, indicating which answers are correct on assignments, sharing links to solutions, posting your own complete work for a question/solution

If you are concerned, confused, or conflicted over something, please reach out to me through email for help. Let's do our best to support one another in this class and keep the online experience a safe, inclusive, and positive experience for everyone.