

Physics in and Around You I Syllabus

Department of Physics & Atmospheric Science
PHYC1310 Fall 2026

Dalhousie University operates in the unceded territories of the Mi'kmaw, Wolastoqey, and Peskotomuhkati Peoples. These sovereign nations hold inherent rights as the original peoples of these lands, and we each carry collective obligations under the Peace and Friendship Treaties. Section 35 of the Constitution Act, 1982, recognizes and affirms Aboriginal and Treaty rights in Canada.

We recognize that African Nova Scotians are a distinct people whose histories, legacies, and contributions have enriched the part of Mi'kma'ki known as Nova Scotia for over 400 years.

Course Instructor

Name	Email	Student Hours
Sean Hartery	sean.hartery@dal.ca	Tuesdays 10:00 - 1:00 PM Dunn 209

1. Course Description

This is an algebra-based introduction to physics for students in Life Sciences, Psychology, Arts and Environmental Sciences, Health Professions, and allied Health Sciences and for students preparing for MCAT, Medicine, and Dentistry. It is accepted as a prerequisite to advanced courses in physics when combined with PHYC 1320.03, MATH 1000.03, and MATH 1010.03. Basic concepts in mechanics, waves, sound, and fluids are applied, where possible, to realistic biological models, e.g., the biomechanics of muscles and joints.

Course Prerequisites

High School Physics equivalent to the Nova Scotia 12 level is *strongly recommended*. Students not having this equivalence are *strongly advised* to take PHYC 0010.00. See the College of Continuing Education at:

<http://collegeofcontinuinged.dal.ca>

Course Exclusions

Credit will be given for only one of PHYC 1190.03 or PHYC 1310.03.

Important Dates

Pre-Course Assessments

Due Wed. Sep. 16th @ 10:00 pm

Tutorials

Begin week of Sept. 14th

Laboratory Experiments

Begin week of Sept. 14th

Assignments

Due every Mon. @ 10:00 pm

Tests

Thu. Oct. 15th, 7:30 – 9:00 PM*

Thu. Nov. 19th, 7:30 – 9:00 PM*

Post-Course Assessment

Due Wed. Dec. 9th @ 10:00 pm

Final exam

TBA

*If you have an academic conflict, there will be an alternate date. See the Assessments section for more info.

2. Lecture Schedule

Students **must** read the relevant sections of the textbook *before* coming to class!

Week	Lecture	Date	Topic	Reading
1	NC	Mon, Sep 07	Labor Day	
	1	Wed, Sep 09	Introduction	Syllabus
	2	Fri, Sep 11	Motion Diagrams	1.3, 1.4
2	3	Mon, Sep 14	Motion Graphs	2.1 - 2.3
	4	Wed, Sep 16	Free-Fall	2.4 - 2.7
	5	Fri, Sep 18	Vectors	3.1 - 3.2, 3.4
3	6	Mon, Sep 21	Projectile Motion I	3.4, 3.5
	7	Wed, Sep 23	Projectile Motion II	3.6
	8	Fri, Sep 25	Newton's 1st & 2nd Law	4.1 - 4.5
4	9	Mon, Sep 28	Free Body Diagrams	4.6
	NC	Wed, Sep 30	Truth & Reconciliation	
	10	Fri, Oct 02	Newtons 3rd Law	4.7
5	11	Mon, Oct 05	Normal Forces	5.1 - 5.4
	12	Wed, Oct 07	Friction	5.5
	13	Fri, Oct 09	Tension	5.7 - 5.8
6	NC	Mon, Oct 12	Thanksgiving	
	14	Wed, Oct 14	Circular Motion	6.1 - 6.3
	15	Fri, Oct 16	Torque	7.1, 7.3
7	16	Mon, Oct 19	Center of Mass	7.4
	17	Wed, Oct 21	Stability	8.1 - 8.2
	18	Fri, Oct 23	Hooke's Law	8.3 - 8.4
8	19	Mon, Oct 26	Biomechanics	8.5
	20	Wed, Oct 28	Impulse & Momentum	9.1 - 9.5
	21	Fri, Oct 30	Work & Energy	10.1 - 10.3
9	22	Mon, Nov 02	Conservation of Energy	10.4, 10.6, 10.7
	23	Wed, Nov 04	Potential Energy	10.6
	24	Fri, Nov 06	Thermal Energy	10.5
10	NC	Mon, Nov 09	Reading Week	
	NC	Wed, Nov 11		
	NC	Fri, Nov 13		
11	25	Mon, Nov 16	Power	10.10, 11.1 - 11.3
	26	Wed, Nov 18	Simple Harmonic Motion	14.1 - 14.3
	27	Fri, Nov 20	Vertical Springs	14.4
12	28	Mon, Nov 23	Resonance	14.5 - 14.7
	29	Wed, Nov 25	Waves	15.1 - 15.3
	30	Fri, Nov 27	Superposition	16.1 - 16.2
13	31	Mon, Nov 30	Strings	16.3
	32	Wed, Dec 02	Tubes	16.4 - 16.5
	33	Fri, Dec 04	Wave Intensity	15.5
14	34	Mon, Dec 07	Pressure	13.1
	35	Wed, Dec 09	Hydrostatics	13.2

NC: No Class

3. Course Materials

a. Textbook (required)

“College Physics: A Strategic Approach”, 4th edition
Randall D Knight, Brian Jones & Stuart Field

You can purchase the physical textbook or eBook from the Studley bookstore.

b. TopHat (required)

TopHat will be used for in-class learning activities, allowing you to earn participation marks in class via your smartphone, tablet, laptop, or cell phone. You can purchase a TopHat subscription via the Studley Bookstore. You must join the course using code: 612875, using your Banner ID (BXXXXXXXXX) as your student ID.

c. Scientific Calculator (required)

Only **non-programmable** scientific calculators are permitted for use on tests and final exams. The Studley Bookstore carries the following calculators suitable for our course:

- ☐ Casio Fx300Ms
- ☐ Sharp EL-531Xgb-Wh, EL-510Rtb, ELw535
- ☐ Texas Instruments 30Xa

The above list is not exhaustive! If you have a calculator and are wondering if it is permitted, e-mail me. Generally, any scientific calculator which is non-programmable and which does not have a “SOLVE” function is allowed. Graphing calculators (e.g. Ti-84) are not allowed.

d. Laboratory & Tutorial Manual (required)

The laboratory manual gives precise instructions for completing laboratory experiments and worksheets for participating in tutorials. The manual contains the laboratory report forms which you will submit for grading (i.e., you cannot complete your laboratory report without the laboratory manual).

NOTE: The laboratory manual will be available for purchase by Friday Sep. 11th at the latest.

Is the textbook actually required?

Yes – students **must** read the relevant sections of the textbook before arriving to class.

Is the textbook actually useful?

The textbook presents a very clear introduction to physics, identifying many applications to life and medical sciences, letting you see how physics connects to your discipline! It is also designed based on recent research in physics education, exposing you to physics in a manner that helps you learn. For students taking the MCAT, it is a **great** study resource.

!!! Students are expected to have a solid understanding of Nova Scotia Grade 12 mathematics (no knowledge of calculus is required). Students must be able to:

- ☐ Solve a system of two equations and two unknowns
- ☐ Analyze and solve trigonometric problems
- ☐ Solve quadratic equations
- ☐ Solve problems involving exponential and logarithmic equations
- ☐ Create and interpret graphs

While some of these techniques will be reviewed during the course, it is expected that you are **already** familiar and capable with these techniques.

4. Student Resources

a. Student Hours

This is your opportunity to come chat about the course with me, get help with assignments, get study tips, etc. I want you to succeed, so don't be shy!

b. Discussion Boards

This is an excellent avenue to discuss current **assignments**, laboratory experiments, lecture content, or general course logistics on Brightspace. Students can post anonymously and can expect an answer within 24-48 hours.

c. Review Sessions

I will hold a review session before each test. It will be streamed online if you can't make it in person and recorded for later viewing if you can't make it at all.

d. Email

Please only use e-mails for discussing personal matters and re-scheduling laboratory experiments. Any questions relating to course content, or assignments are better addressed in Discussion Boards as other students can benefit from my reply.

5. Course Structure

The course will be delivered in-person through a combination of lectures, laboratory experiments, and tutorials. Lectures will be recorded.

a. Lectures

Class Days: M, W, F

Class Times: 12:35 – 13:25

Classroom: Ondaatje Theatre

Building: Marion McCain Arts & Social Sciences Building

Campus: Studley

b. Laboratories

	B01	B02	B03	B04	B05	B06
Day	M	T	W	R	F	R
Room	Dunn 201	Dunn 201	Dunn 201	Dunn 201	Dunn 201	Dunn 201
Time	2:35 - 5:25	2:35 - 5:35	2:35 - 5:25	2:35 - 5:25	2:35 - 5:25	10:05 - 12:55

c. Tutorials

Note: Tutorials run for half of the duration of the time shown on the academic calendar as detailed below.

	B01	B02	B03	B04	B05	B06
Day	M	T	W	R	F	R
Room	Dunn 304	Dunn 221C	Dunn 304	Dunn 108	Dunn 302	Dunn 135
Time	2:35 – 3:55	2:35 - 3:55	2:35 - 3:55	2:35 - 3:55	2:35 - 3:55	10:05-11:25

6. Laboratory & Tutorial Schedule

Except for students in B05, all students will receive an e-mail specifying their laboratory group (A or B) before their first scheduled activity. Group membership determines whether students will attend the laboratory (X) or tutorial (T) during a given session.

Week	B01A	B01B	B02A	B02B	B03A	B03B	B04A	B04B	B06A	B06B	B05
1	Mon, Sep 07		Tue, Sep 08		Wed, Sep 09		Thu, Sep 10				Fri, Sep 11
2	Mon, Sep 14		Tue, Sep 15		Wed, Sep 16		Thu, Sep 17				Fri, Sep 18
	X1	T1	X1	T1	X1	T1	X1	T1	X1	T1	X1
3	Mon, Sep 21		Tue, Sep 22		Wed, Sep 23		Thu, Sep 24				Fri, Sep 25
	T1	X1	T1	X1	T1	X1	T1	X1	T1	X1	T1
4	Mon, Sep 28		Tue, Sep 29		Wed, Sep 30		Thu, Oct 01				Fri, Oct 02
	X2	T2	X2	T2	T&R*		X2	T2	X2	T2	X2
5	Mon, Oct 05		Tue, Oct 06		Wed, Oct 07		Thu, Oct 08				Fri, Oct 09
	T2	X2	T2	X2	T2	X2	T2	X2	T2	X2	T2
6	Mon, Oct 12		Tue, Oct 13		Wed, Oct 14		Thu, Oct 15				Fri, Oct 16
	Thanksgiving**		X3		X3	T2	X3		X3		X3
7	Mon, Oct 19		Tue, Oct 20		Wed, Oct 21		Thu, Oct 22				Fri, Oct 23
	T3	X3	T3	X3	T3	X3	T3	X3	T3	X3	T3
8	Mon, Oct 26		Tue, Oct 27		Wed, Oct 28		Thu, Oct 29				Fri, Oct 30
	X4	T3	X4	T3	X4	T3	X4	T3	X4	T3	X4
9	Mon, Nov 02		Tue, Nov 03		Wed, Nov 04		Thu, Nov 05				Fri, Nov 06
	T4	X4	T4	X4	T4	X4	T4	X4	T4	X4	T4
10	Mon, Nov 09		Tue, Nov 10		Wed, Nov 11		Thu, Nov 12				Fri, Nov 13
11	Mon, Nov 16		Tue, Nov 17		Wed, Nov 18		Thu, Nov 19				Fri, Nov 20
		T4		T4		T4		T4		T4	
12	Mon, Nov 23		Tue, Nov 24		Wed, Nov 25		Thu, Nov 26				Fri, Nov 27
	X5	T5	X5	T5	X5	T5	X5	T5	X5	T5	X5
13	Mon, Nov 30		Tue, Dec 01		Wed, Dec 02		Thu, Dec 03				Fri, Dec 04
	T5	X5	T5	X5	T5	X5	T5	X5	T5	X5	T5
14	Mon, Dec 07		Tue, Dec 08		Wed, Dec 09		Thu, Dec 10				Fri, Dec 11
	X3				X2						

*B03A will complete X2 on December 9th. B03B will complete T2 on October 14th.

**B01A will complete X2 on December 7th

About Me

I received my PhD in Physics from the University of Canterbury studying aerosol-cloud interactions over the Southern Ocean (the picture to the right shows me in a mobile lab off the coast of Antarctica). While I always intended to stay in research, in 2023 I accepted a teaching position at Augusta University following some postdoctoral work at Dalhousie. I quickly found that the joy of working with students as they explored the fundamental concepts of physics much outweighed my joy for research. I decided to pursue a career where I could focus fully on teaching. In 2023, I was given the opportunity to bring my love and passion for teaching physics back to Dalhousie – I hope that I get to share some of my joy of physics with you.

Outside of teaching, I enjoy biking, baking, playing guitar, drinking coffee, seeing live music, and hanging out with my two cats, Pebble and Pangea. My Dungeons and Dragons character is an Oath of Glory Paladin named Swab. My favorite band is Tonstartssbandht. I have trouble with audio processing in loud environments – so I might ask you to repeat yourself. I am also terrible at maintaining eye contact – please don't take either of these personally.



7. Learning Objectives

Upon successful completion of PHYC1310, a student will be able to:

<i>Draw & Interpret:</i>	graphical vector operations, motion diagrams, free body diagrams, extended body diagrams, and energy diagrams.
<i>Correctly Use:</i>	scientific notation, units, and significant figures.
<i>Calculate:</i>	unit conversions, speed, velocity, acceleration, centripetal acceleration, components of vectors, tension in ropes, angular velocity, angular acceleration, torque, center of gravity, elastic properties of materials, momentum, impulse, work, kinetic energy, potential energy, change in thermal energy, power, efficiency, period, frequency, wave speed, loudness, density, and pressure.
<i>Solve Problems Involving:</i>	motion with uniform velocity, motion with constant acceleration, projectile motion, circular motion, objects in static equilibrium, dynamic motion of accelerating objects, static & kinetic friction, interacting objects, impulse and momentum, conservation of momentum, conservation of energy, simple pendulums, sound waves, superposition, standing waves, and hydrostatics.
<i>Identify:</i>	forces acting on an object, action/reaction pairs of forces, and transformations of energy.
<i>Apply:</i>	Newton's Laws and Conservation of Energy & Momentum, generally, to various systems.

8. Assessments

Two methods will be used to calculate your final grade. You will be given the benefit of whichever method produces the higher final grade.

Assessment	Method 1	Method 2
Assignments	15%	15%
Laboratory	15%	15%
Tutorials	2%	2%
TopHat	2%	2%
Pre & Post Course Assessments	1%	1%
Test 1	17.5%	Best Test: 25%
Test 2	17.5%	
Final Exam	30%	

a. Assignments

There are two types of assignments: weekly “quizzes” and bi-weekly “workbook assessments”. As there will be roughly twice as many digital quizzes as workbook assessments, “quizzes” are worth 10% of your final grade, while workbook “assignments” are worth 5% of your final grade.

“Quizzes” (10%)

A weekly Brightspace quiz containing 10 - 15 qualitative and quantitative questions related to the content in prior lectures. The quiz should be treated like an ordinary assignment: you can access your notes, the textbook, and even ask the instructor or your classmates for assistance. You can attempt the quiz as many times as you wish during the available period. Brightspace will retain the score of your best attempt. Your lowest scoring quiz is ignored when calculating your final grade.

“Workbook Assessments” (5%)

Every second week, you will be required to complete a “workbook assessment” – the question(s) from the assessment are identical to those on the quiz, but will often have additional steps. This is our opportunity to give you more detailed feedback on your problem-solving techniques. Your lowest scoring workbook is ignored when calculating your final grade.

b. Tutorials

Your grade for tutorial is based on attendance. You **must** sign the attendance sheet and actively participate in the activity to receive credit for attending the tutorial. You can miss one tutorial without penalty.

c. Laboratory

You will complete five (5) laboratory experiments over the course of the semester. Laboratory work will be completed in randomized groups of 2 or 3 and requires participation of all group members. At the end of your laboratory session, your group will submit a single laboratory report containing your measurements, graphical analyses, uncertainty analyses, and calculations. Each group member will summarize their group’s findings separately. Your laboratory grade will be calculated as the average grade of your four best laboratory reports.

d. TopHat

Starting September 14th, there will be at least one (1) TopHat question per lecture. A correct answer will earn 1 pt, while an incorrect answer will still earn 0.5 pts. Your total TopHat score over the entire semester will be recorded, with your three (3) lowest scoring lectures dropped to account for absences.

e. Pre-Course and Post-Course Assessments

There will be four mandatory, participation-based assessments: three (3) pre-course assessments will be conducted at the start of term and one (1) post-course assessment will be conducted at the end of term. You will receive full credit for honestly & diligently completing the assessments, but you will not be scored according to correctness. You must complete all four (4) assessments to receive credit. Partial credit will not be given. These assessments will be administered via Brightspace.

f. Tests

	Test 1	Test 2
Date	Thu. Oct. 15th	Thu. Nov 19 th
Time	7:30 - 9:00 PM	7:30 - 9:00 PM

Tests will take place in different classrooms across the main Studley campus. Classroom assignments will be posted on Brightspace prior to each test. **If you have a conflict with another scheduled course and the test dates above, you must sign up for the alternate date(s) below. Seats for the alternate dates are reserved for students with academic conflicts.**

	Test 1 Alternate Date	Test 2 Alternate Date
Date	Wed. Oct. 14th	Wed. Nov 18th
Time	7:30 - 9:00 PM	7:30 - 9:00 PM

g. Final Exam

The final exam will be a cumulative test of all content featured in lectures, laboratory experiments and tutorials. You will have three hours to complete the exam, though I generally design the exam to be completed in two. There will be additional emphasis on material not featured on Tests 1 or 2. The exam will be in-person during the exam period. The date of this exam is scheduled by the Registrar's Office.

h. Calculation of Final Grades

Conversion of numerical grades to final letter grades follows the Dalhousie Grade Scale:

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (0-49)
A- (80-84)	B- (70-72)	C- (55-59)	

Please note that your final numerical grade is rounded to the nearest whole number (e.g. 89.5 → 90, 89.1 → 89) before conversion to the letter grades above.

9. Course Policies on Missed or Late Academic Requirements

a. Assignments

There will be **no extensions** granted for assignments, *unless*:

- 1) A student has documented accommodations with SAS specifying assignment extensions, **and**
- 2) A student has communicated at least 2 days in advance of the deadline that they want to apply their accommodations to an assessment.

If the above conditions are satisfied, an extension of two days will be given.

Late assignments will not be accepted and will receive a grade of 0. To accommodate this lack of leniency, your lowest scoring digital quiz and workbook will be dropped.

b. Laboratory

If you must miss a laboratory, please contact the Laboratory Instructor as soon as possible to reschedule. A student must attend during their scheduled laboratory session unless given permission otherwise. Your lowest laboratory report grade is dropped, so you can generally miss one laboratory session without penalty.

c. Tutorial

If you must miss a tutorial, you may attend any available session for that tutorial. You do not need to inform the instructor. You can miss one tutorial session without penalty.

d. Tests

If you must miss a test – for any reason – your final grade will automatically be calculated according to Method 2. If you do miss a test, please complete a Student Declaration of Absence (SDA) and forward it to the course lecturer. You may use an SDA for one test only. A copy of this form is available on Brightspace.

e. Final Exam

Students are required to take their final exam at the time scheduled by the registrar, except under *exceptional* circumstances. Such circumstances include illness with an acceptable medical certificate. Elective arrangements (such as travel plans) are not considered acceptable grounds for granting an alternative examination time. A Student Declaration of Absence is not applicable to the final exam.

For University-wide deadlines for payment of academic fees, course withdrawals, convocation, etc. please visit: https://www.dal.ca/academics/important_dates.html

10. Course Policies related to Academic Integrity

Formal academic collaboration (co-authorship) is limited to laboratory work, *excluding* pre-labs. All other coursework submitted for grading must represent your work and your work alone. To be clear:

- × Students are not permitted to access or copy another student's homework assignments, laboratory reports, pre-laboratory assignments, tests or exams (including those of past students).
- × Students are not permitted to use or distribute software for automating the completion of assignment work (e.g., equation solvers).
- × Students are not permitted to use any device which would enable cheating during a test or final exam.
- × Students are not permitted to use courseware like Chegg, Course Hero, Quizlet, or LLMs (including but not limited to) ChatGPT to complete any coursework submitted for grading.
- × A student who supplies their coursework to another student (in the present semester and/or a future semester) also commits an act of plagiarism.

If a student commits a serious act of plagiarism or academic dishonesty, it may result in an automatic grade of F for the course. Continued offenses may result in expulsion from Dalhousie. For more information on Dalhousie University's Academic Integrity policies, please consult:

https://www.dal.ca/dept/university_secretariat/academic-integrity.html

11. A Note About AI

I strongly recommend reading the following report on *cognitive offloading* by researchers at MIT: <https://www.media.mit.edu/publications/your-brain-on-chatgpt/> (Kosmyna et al., 2025). The findings are rather grim, showing that the critical thinking skills of users who habitually use AI degrade over time. Ok, sure, but maybe you are just worried about your grade. Well... more recent research has shown that whatever increase in assignment grade is gained through AI is subsequently lost on tests and exams (Strömberg et al, 2026). As tests & exams make up a much larger portion of your grade (and are a better testament to your understanding), you would be shooting yourself in the foot to rely on AI for homework or whilst studying.

I hope that this course will provide you with a deep understanding of physics and how it applies to your discipline; but acquiring this understanding necessarily requires YOU to do the thinking. Unless you are confident that you are using AI in a way that amplifies your studying and understanding (e.g.,

asking it to generate some practice problems or conceptual questions to help you prepare for a test), then I strongly recommend against using AI at all.

Nataliya Kosmyna, Eugene Hauptmann, Ye Tong Yuan, Jessica Situ, Xian-Hao Liao, Ashly Vivian Beresnitzky, Iris Braunstein, and Pattie Maes. "Your brain on chatgpt: Accumulation of cognitive debt when using an ai assistant for essay writing task." arXiv preprint arXiv:2506.08872 (2025).

Strömberg, David and Lei, Victor and Wu, Yanhui, The Generative AI Learning Penalty: Evidence from Chinese Secondary Education (June 02, 2026). CEPR Discussion paper: DP21577, Available at SSRN: <https://ssrn.com/abstract=6977138> or <http://dx.doi.org/10.2139/ssrn.6977138>

12. Course Accessibility

Religious, Cultural, and Community Based Accommodations

Students are eligible for accommodations based on [protected characteristics](#) such as religion. If you have [religious, cultural, or community-significant observances](#) that conflict with course requirements, please reach out to me to collaboratively find alternatives for completing course requirements.

Academic Accommodations

To begin the process of requesting formal academic accommodations (e.g. extended time for writing tests, assignment extensions, etc.), contact the [Student Accessibility Centre](#).

Syllabus Appendix

Please use the following link to access Dalhousie's "Syllabus Appendix". The appendix has important resources, statements, policies, and guidelines geared towards supporting students. [Syllabus Appendix: Student Supports & University Statements, Policies, and Guidelines](#)