OVERVIEW

This course is intended for students with little or no background in Science. It introduces physics through a set of modules that closely connected to our everyday life and future.

This course is only available on-line via Brightspace.

Please note that Faculty of Science students may only take this course as a free elective.

LAND ACKNOLEDGMENT

We recognize the Algonquin peoples as the traditional custodians of the land in which the campus is located, and where the class is taught. You are invited to learn more, reflect on how you can support anti-racism and decolonization, and take action. https://carleton.ca/indigenous/

EQUITY DIVERSITY AND INCLUSION STATEMENT

We are committed to creating a community that is as inclusive and diverse as the people that our professions serve. All students in the PHYS1902 class need to have a fundamental understanding of anti-racism, decolonization, Indigenization, and EDI. EDI plays a significant role in what we do in our class and in our day-to-day lives. An environment where we understand, and respect EDI is essential for each individual to fulfill their potential.
COURSE LEVEL LEARNING OUTCOMES

By the end of the course, students should be able to:

1. Explain physics related phenomenon using basic physics principles and terminology
2. Perform basic calculation/estimations to solve simple physics related problems
3. Make correct judgement/decisions on physics related issues in their daily life based on basic physics principles

TEXTBOOK

The optional text-book for the course is “Physics Beyond the Comfort Zone” by Peter Watson. This textbook has a number of relevant sections relating to material for this course, but does not cover some areas. The lectures and supplementary materials are intended to cover the course with this textbook as a useful but optional additional aid. This is an e-text book is available online or iBooks for $9.99:


CONTENT

The following thematic modules will be covered in this course. Each module will help you answer a series of questions listed below.

1. **Transportation**
   
   If you drive a car and take a bus to get from point A to B. How to estimate your travel time and average speed? Have you wondered what forces are involved to keep the cars moving? What is the physics behind the safety rules on the road, especially in winter? Can physics help you pick a car that is safer during collision? What are the physical factors that determine the fuel economy of a car?

2. **Sports**

   Physics is at the very heart of every sport. A good understanding of physics will help athletes maximize their potential. What forces are involved in cycling? Can a cyclist outrun a car? How strong a rope should you chose for rock climbing? How do figure skaters control their spins? What is the best projection angle for shot put?
3. Weather and climate
Global warming is almost too well-known to require discussion, but most people have a very limited understanding on the underlying science. If we cannot predict the weather over more than a week, how can we hope to predict climate change of a century? If there are equations that describe the weather, why can’t we predict where hurricanes will go? Why is carbon dioxide so important?

4. Home Electricity
Our civilization is very dependent on electrical power. But what is electricity? How is electricity generated and transferred? How do light bulbs work? How efficient are some of the common appliances? How to estimate the electricity consumptions of a household? What are the preclusions for electrical safety?

5. Green Energy
From human body, to cars, to factories, to the whole human society, nothing will function without energy. As our demand increases, what are the GREEN energy sources? How is the energy generated from these sources? How efficient are they? What are the environment impacts of different energy sources?

MODULE COMPLETION DATES AND PHYSICS TOPICS COVERED

<table>
<thead>
<tr>
<th>Thematic Modules</th>
<th>Expected completion dates of lecture videos</th>
<th>Physics topics Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Transportation</td>
<td>May 12</td>
<td>Linear motion, Speed, velocity, acceleration, Force, Newton’s laws, circular motion, friction, collision, energy and momentum</td>
</tr>
<tr>
<td>2. Sports</td>
<td>May 19</td>
<td>Force, energy, projectile motion, rotation, moment of inertia, angular momentum</td>
</tr>
<tr>
<td>3. Weather and climate</td>
<td>May 26</td>
<td>Energy, heat and temperature, the first law thermodynamics, heat transfer, black body radiation</td>
</tr>
<tr>
<td>4. Home Electricity</td>
<td>June 2</td>
<td>Electrostatics, electric potential, current, and resistance, ohm’s law, electric power, refrigeration, electric safety</td>
</tr>
<tr>
<td>5. Green Energy</td>
<td>June 9</td>
<td>Electricity as energy, Electromagnetic Induction, thermal power generation, heat engine, nuclear power, solar power, wind power, biofuels</td>
</tr>
</tbody>
</table>
EVALUATION

1. (40%) Module quizzes
   At the end of each thematic modules, there will be an online quiz of 15 multi-choice questions. Quizzes will always open on Monday and must be completed before Sunday mid night (11:59 pm). Each quiz account for 8% of the final mark.

<table>
<thead>
<tr>
<th>Thematic Module</th>
<th>Module quiz due date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Transportation</td>
<td>May 19, 11:59 pm</td>
</tr>
<tr>
<td>2. Sports</td>
<td>May 26, 11:59 pm</td>
</tr>
<tr>
<td>3. Weather and climate</td>
<td>June 2, 11:59 pm</td>
</tr>
<tr>
<td>4. Home Electricity</td>
<td>June 9, 11:59 pm</td>
</tr>
<tr>
<td>5. Green Energy</td>
<td>June 16, 11:59 pm</td>
</tr>
</tbody>
</table>

2. (40%) Two writing projects
   Each thematic module has suggested essay topics and/or a lab you can perform using materials or devices that are available in your home.

   You are required to write two essays or lab reports on two of the five topics of your choice. The first (essay or lab) must be chosen from the first two thematic Modules (Transportation and Sport). The second (essay or lab) must be chosen from the last three modules (Weather and climate, Home Electricity, and Green Energy). At one of the two writing project has to be essay, i.e. you can chose (one essay + one lab), or two essays.

   The due dates at listed in this table:

<table>
<thead>
<tr>
<th>Thematic Modules</th>
<th>Module essay or lab report due dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Essay/Short video</td>
<td>The 1st Essay or Lab report due on June 1, 11:59 pm</td>
</tr>
<tr>
<td>or Lab Must pick one</td>
<td></td>
</tr>
<tr>
<td>of the two topics</td>
<td></td>
</tr>
<tr>
<td>2nd Essay/Short video</td>
<td>The 2nd Essay or Lab report due on June 15, 11:59 pm</td>
</tr>
<tr>
<td>or Lab Must pick one</td>
<td></td>
</tr>
<tr>
<td>of the three topics</td>
<td></td>
</tr>
<tr>
<td>1. Transportation</td>
<td></td>
</tr>
<tr>
<td>2. Sports</td>
<td></td>
</tr>
<tr>
<td>3. Weather and climate</td>
<td></td>
</tr>
<tr>
<td>4. Home Electricity</td>
<td></td>
</tr>
<tr>
<td>5. Green Energy</td>
<td></td>
</tr>
</tbody>
</table>

   For the lab report, a write up template will be provided. The essay has to be 800-1000 words. Both the essay and lab reports must be written using word processing software. **Hand written essays will NOT be accepted and will be given zero mark.** Essays or lab reports should be uploaded via Brightspace.
3. (20%) Final online quiz
   During the final exam period, there will be an online quiz of multi-choice questions that covers all the content of the course.

COPYING, PLAGIARISM AND OTHER FORMS OF CHEATING

The attention of all students is drawn to section E.12 of the Academic Regulations of the University: https://carleton.ca/registrar/academic-integrity/

Such offences will normally result in a mark of zero on the cheated work. In addition, a report will be sent to the Dean of the student's Faculty, for possible further disciplinary action.

ACADEMIC ACCOMMODATIONS

Requests for Academic Accommodation
You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

Pregnancy obligation
Please contact your instructor 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, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Religious obligation
Please contact your instructor 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, visit the Equity Services website: carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

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.

carleton.ca/pmc

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 is 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: carleton.ca/sexual-violence-support

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 your instructor 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 information on academic accommodation, please contact the departmental administrator or visit:  
students.carleton.ca/course-outline

**Assistance for Students:**
Academic and Career Development Services: https://carleton.ca/career/for-facultystaff/how-can-you-support-career-development/
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/

**Important Information:**
- Student or professor materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

- Standing in a course is determined by the course instructor subject to the approval of the Faculty Dean. This means that grades submitted by the instructor may be subject to revision. No grades are final until they have been approved by the Dean.

- Carleton University is committed to protecting the privacy of those who study or work here (currently and formerly). To that end, Carleton’s Privacy Office seeks to encourage the implementation of the privacy provisions of Ontario’s *Freedom of Information and Protection of Privacy Act (FIPPA)* within the university.

- In accordance with FIPPA, please ensure all communication with staff/faculty is via your Carleton email account. To get your Carleton Email you will need to activate your MyCarletonOne account through Carleton Central. Once you have activated your MyCarletonOne account, log into the MyCarleton Portal.
Important Dates

Summer Sessions:

- **Early Summer**: May 6, 2024 to June 18, 2024
- **Late Summer**: July 2, 2024 to August 14, 2024
- **Full Summer**: May 6, 2024 to August 14, 2024

May 1

Last day for receipt of applications for undergraduate internal degree transfers to allow for registration for the summer term.

May 6

**Early** summer and **full** summer courses begin.

May 10

Last day for registration and course changes (including auditing) for **early** summer courses.

May 17

Last day for registration and course changes (including auditing) for **full** summer courses.

May 17 – 29

Fall/Winter and winter term deferred final examinations will be held.

May 20

Statutory holiday. University closed.

May 31

Last day to withdraw from full summer courses with a full fee adjustment.

June 1

Last day to request Formal Examination Accommodation for **early** summer examinations to the Paul Menton Centre for Students with Disabilities. Note that it may not be possible to fulfill accommodation requests received after the specified deadlines.

June 1

Last day for academic withdrawal from **early** summer courses.

June 11

Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade for **early** summer courses before the official examination period (see Examination Regulations in the Academic Regulations of the University section of the Undergraduate Calendar).

June 18

Last day of **early** summer classes (NOTE: Full summer classes resume July 2). Last day for academic withdrawal from **early** summer courses.

Last day for handing in term assignments, subject to any earlier course deadline.

June 19 – 20

No classes or examinations take place.

June 21 – 27

**Early** summer final examinations and mid-term examinations in **full** summer courses may be held. Examinations are normally held all seven days of the week.

July 1

Statutory holiday. University closed.

July 2

**Late** summer courses begin.

**Full** summer courses resume.
July 8  
Last day for registration and course changes (including auditing) for late summer courses.

July 15  
Last day to withdraw from late summer courses with a full fee adjustment.

July 19 – 21  
Early summer term deferred final examinations to be held.

August 1  
Last day to request Formal Examination Accommodation for August examinations to the Paul Mention Centre for Students with Disabilities. Note that it may not be possible to fulfill accommodation requests received after the specified deadlines.

August 1  
Last day for academic withdrawal from full and late summer courses.

August 5  
Civic holiday. University closed.

August 7  
Last day for summative tests or examinations, or formative tests or examinations totaling more than 15% of the final grade for late summer and full summer courses before the official examination period (see Examination Regulations in the Academic Regulations of the University section of the Undergraduate Calendar).

August 14  
Last day of late summer and full summer classes.
Last day for handing in term assignments, subject to any earlier course deadline.

August 15 – 16  
No classes or examinations take place.

August 17 – 23  
Final examinations in late summer and full summer courses may be held. Examinations are normally held all seven days of the week.

August 23  
All take home examinations are due on this day, with the exception of those conforming to the Examinations regulations in the Academic Regulations of the University section of the Undergraduate Calendar/General Regulations of the Graduate Calendar.

September 20 – 22  
Late summer and full summer term deferred final examinations will be held.