

Physics 1007A S2020: Course Outline v4

This is the first part of a two-term physics course with an emphasis on essentials for scientists in other disciplines. This first part of the course covers the basic laws of physics, such as Motion, Force, Newton's Laws of Motion, Energy, Rotational Motion, Collisions, Fluids and Heat Transfer. Applications to other scientific disciplines and real-world examples will be used whenever possible.

Due to the COVID-19 quarantine conditions, this course has been moved to be online only for this summer. The lectures will be recorded and will be available at any time for asynchronous learning. The virtual laboratories will concentrate on data analysis techniques, using online simulations of real experiments.

The main course elements, lecture material, scope of the topics covered, online tests and written assignments remain unchanged from the normal summer course offerings. The virtual laboratories will concentrate on data analysis techniques.

Lecturer: Dr. Andrew Robinson, Room HP3368, ext. 8922

e-mail: andrew.robinson@carleton.ca

Office Hours: Dr Robinson will provide office hours/tutorial sessions every day for 1 hour, using the Big Blue Button video conferencing system, which is built into CuLearn. The times will be set by mutual convenience for the class and instructor.

Laboratory Co-ordinator: Dr. Igor Ivanovic

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The course outline will be posted on the cuLearn website. We reserve the right to amend the course outline on the cuLearn website and will inform you if that version changes. In the event of any discrepancy between this document, and the version currently posted on the website, then the website version on cuLearn will be taken as the definitive version.

General Policies for Physics Courses

Please see <http://www.physics.carleton.ca/current-undergraduate-students/academic-policies> for all Physics Department's course policies. All the course information, as well as lab assignments, list of marks, etc. will be displayed on the class website in cuLearn.

Email

Every student must use their Carleton e-mail account in any communication to University academic staff. Emails from external e-mail accounts will not be answered. An email to the Carleton staff should be treated as a formal communication with the university. Please compose your messages as such, and always include your course number and student number in the email.

Online Lectures

The lectures from the previous year have been recorded to video and will be available online. The course will be divided into 12 modules, which roughly cover a three-hour traditional lecture. The module has been divided into a number of individual units, so that individual units are typically 10-15 minutes long. Each module will contain short online “Test your understanding quizzes”, to allow the student to check on their understanding of the material in the module. Doing these quizzes will count as a participation grade in the final course grade.

Required materials

1. Textbook: ‘Physics’, Fifth Edition, Giambattista, Richardson and Richardson, McGraw Hill. (Any of the 3rd, 4th or 5th edition will do – try and find a second-hand copy, if at all possible. The same textbook is used for Physics 1008).
2. A non-programmable scientific calculator. There is no preferred model.

Note that a second-hand copy of the textbook will be sufficient for this course. We will not be using the Publisher’s website, so no access code is required.

Prerequisites

- (i) Grade 12 Advanced Functions or Grade 12 Geometry and Discrete Mathematics or equivalent, or MATH 0107 (may be taken concurrently) or
- (ii) Grade 12 Calculus and Vectors or Grade 12 Advanced Functions and Introductory Calculus or equivalent, or MATH 0007 (may be taken concurrently) or
- (iii) Permission of the Physics Department. Note that if you already registered, you have approval from the department.

Online Assessments

There will be a summative online assessment for each Module. The best 10 out of 12 scores will be used to calculate the final grade contribution

Written Assignments

There will be five take-home written assignments during the course. These are to give you practice in answering questions and will provide feedback on how to answer physics questions effectively. The level of difficulty will be similar to questions on the final examination. These questions are set to test your ability to think logically, solve a problem, and set your work out in a satisfactory manner. We will be able to provide formative feedback on your answers through written comments. These will be submitted electronically in PDF form through CuLearn.

You are reminded that plagiarism is a serious academic offence, and if detected will result in a report being set to the Dean's Office for investigation. Both the person copying AND the person providing the work to be copied will be reported.

The final grade will be calculated using the following formula:

Written Assignments (best 4 scores out of 5) 15%

Test Your Understanding quizzes (participate in 80% of assigned quizzes) 5%

Online Assessments (best 10 scores out of 12) 25%

Final Exam 25%

Virtual Laboratory 30% (All 5 lab grades count)

Laboratory

Due to the circumstances, this term Labs will be different from regular Labs. The measurement and hands-on part of the Labs will be mostly missing. Most of the work will consist of analyzing earlier collected data. stressing the statistics, uncertainties, error propagation and results comparison, extracted from the provided data.

Students will **download and use the program, "LoggerPro"** from Vernier (the download site and password will be provided through cuLearn). An introduction to LoggerPro will be given in the First Lab session. For each Lab a LoggerPro file with a set of data will be provided, individually, for each student., who will analyze it and write a report. These data should then be analyzed, again through LoggerPro, and the completed LoggerPro file will

then become a part of the laboratory report. Both report file and LoggerPro file will be uploaded, back to CuLearn for marking by TAs

The list of Labs is the same as in previous years:

1. Introductory Session
2. Reaction Time
3. Density
4. Atwoods Machine
5. Spring Constant
6. Specific Heat Capacity of Water

Each Lab will have a PreLab Quiz, made out of 5 to 6 questions which students should prepare and answer by reading the Lab manual. The time allotted for each prelab Quiz is one hour and the number of attempts is unlimited, while the closing time is 30 minutes before the start of the Lab. The highest mark, from all attempts, is then counted towards the Lab mark for that particular Lab.

All the Lab sessions will be delivered through the BigBlueButton video conferencing system on cuLearn. Each Lab session will start with an introduction in which main items will be discussed. Students will be strongly encouraged to get involved in discussions. The students should read about the experiment in the Manual, ask questions during Office Hours sessions, and then after listening to the Lab introduction, become fully prepared for the Lab work. When possible, suggestions on how to perform a simplified version of the experiment at home, will also be given.

After this introduction, student will be given a LoggerPro file with a set of measurement data for a corresponding experiment which was performed in the previous year. The results of the experiment are then included in the report, which will be a fillable document (either PDF or Word). The report, together with the LoggerPro file must be submitted after certain period of time.

The mark for each Lab will be calculated as

10% PreLab Quiz

90% Report and LoggerPro file

We reserve the right to change in delivery of the Labs as the course progresses, in the light of operational experience with the systems.

Laboratory Exemptions

Due to quarantine conditions, the laboratory will be conducted remotely. If you have taken Physics 1007 before, then you may be entitled to a lab exemption. Please contact the Lab Co-ordinator and inform them in which year and session you took Physics 1007 previously, so that they can determine your laboratory grade and your eligibility for the exemption. If you have taken a University level course elsewhere with a similar laboratory component to ours, then you may also be eligible for a lab exemption, at the Lab Co-ordinator's discretion.

Absence from Tests or Laboratory

If a deadline for an assigned piece of work is missed, please contact Dr Robinson (online tests and written assignments) or the laboratory supervisor (for laboratory assignments). We will be taking a flexible approach to accommodations and will grant appropriate extensions to deadlines. All assigned work must be completed by the last day of classes.

Passing Conditions

To pass the course with a grade greater than D-, students must pass both the lab course and the lecture course separately. A student will be awarded a D- if the lab is failed, no matter how good the marks from the lecture course are, or how high the total average is. Students will be given all information in the first lab session on the requirements for obtaining a passing grade in the laboratory course. Students may apply for a deferred exam only if their work in online and written test averages over 25% for the whole term. To pass the lecture course, submission at the final exam is mandatory.

Academic Honesty Policy

Students should read and be familiar with the university's policies on academic integrity, given in Section E.12 of the Academic Regulations of the University:

<http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/academicintegrity/>

In this course, these rules are relevant mainly for lab reports (do not copy someone else's), tutorial tests and the final exam (do not attempt to use unauthorized materials or collaborate with other students). A report will be sent automatically to the Dean of your Faculty, for possible further disciplinary action.

Academic Accommodation

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

a. Pregnancy Accommodations: write 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: <http://www.carleton.ca/equity/>

b. Religious Accommodations: write any requests for academic accommodation due to religious obligations 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 (as above).

c. The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your **Letter of Accommodation** at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). **Requests made within two weeks will be reviewed on a case-by-case basis.** After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (*if applicable*).

General Information about the PMC is here:

<http://www1.carleton.ca/pmc/>

Dates and Deadlines for Registered Students

<https://carleton.ca/pmc/students-registered-with-pmc/important-dates-and-deadlines/>

If you have an academic accommodation, PLEASE talk to me, so we can discuss the situation, and how we can accommodate course work, tutorial tests, and other course related activity. I can work with you to solve any issues you may have with the course, provided I know about the issues.

This also applies if something unexpected occurs during the course, such as a family crisis, or illness. Please let me know immediately, so that I can arrange appropriate

Intellectual property

All teaching and learning activities, including lectures, discussions, presentations by both instructors and students are copyright protected and remain the intellectual property of their respective author(s). All course materials, including PowerPoint presentations, video presentations, pdf's, outlines, and other materials, are also 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).

Final Exam

The final exam will be online and will have both short answer and long answer questions on it. The final examination date is scheduled by the central University scheduling service and will not be announced until part of the way through term. The exams will be held between 19th – 25th June. Please do not make any travel arrangements until the examination date has been confirmed.

Course Schedule

Week Beginning	Module	Topic	Textbook Chapter	Written Assignments
4th May	1	Course Introduction	Chapter 1	
	2	Physics Techniques	Chapters 1,2, and 3	
11th May	3	Motion in 1-dimension	Chapter 2	Assignment 1 Due Wed 13th May
	4	Motion in 2-dimensions	Chapter 3	
18th May	5	Newton's Laws of Motion	Chapter 4	Assignment 2 Due Wed May 20th
	6	Work and Energy	Chapter 6	
25th May	7	Rotational Motion	Chapters 5 and 8	Assignment 3 Due Wed May 27th
	8	Collisions	Chapter 7	
1st June	9	Fluids	Chapter 9	Assignment 4 Due Wed 3rd June
	10	Oscillation	Chapter 10	
8th June	11	Waves and Sound	Chapters 11, 12	Assignment 5 Due Wed 10th June
15th June	12	Heat and Thermodynamics	Chapters 13, 14	
19th June to 25th June	Examinations			

University Dates and Deadlines

Graduate, Undergraduate and Special Students

Sessions:

- **Early Summer:** May 4, 2020 to June 16, 2020
- **Late Summer:** July 2, 2020 to August 14, 2020
- **Full Summer:** May 4, 2020 to August 14, 2020

March 1, 2020

Last day for receipt of applications for admission to an undergraduate degree program for the summer term.

March 18, 2020

Financial holds preventing registration will be applied to accounts with an outstanding balance. In order to prevent delayed registration for Summer 2020 courses, please allow adequate processing time as payments normally take 2 days to be applied to your student account.

April 16, 2020

Carleton Central opens at 8:30 a.m. for registration for Carleton University degree students (graduate and undergraduate). Check your time-ticket [here](#).

April 20, 2020

Carleton Central opens at 8:30 a.m. for registration for Carleton University Special Students (non-degree).

April 27, 2020

Registration for University of Ottawa undergraduate exchange students begins. Registration opens at 8:30 a.m.

May 1, 2020

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

May 4, 2020

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

May 7, 2020

Deadline for fee payment or assignment of funding to ensure payment is processed to your account without incurring a late charge. Payment of fees is due by the [posted deadlines](#).

May 11, 2020

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

May 15, 2020

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

May 15-27, 2020

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

May 18, 2020

Statutory holiday. University closed.

May 22, 2020

Last day for a full fee adjustment when withdrawing from **early** summer and **full** summer courses (financial withdrawal). Withdrawals after this date will result in a permanent notation of WDN on the official transcript.

May 29, 2020

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 9, 2020

Last day for summative tests or examinations, or formative tests or examinations totalling 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 12, 2020

Graduate students who have not electronically submitted their final thesis copy to the Faculty of Graduate and Postdoctoral Affairs will not be eligible to graduate in Spring 2020 and must register for the Summer 2020 term.

June 16, 2020

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 17-18, 2020

No classes or examinations take place.

June 19-25, 2020

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.

June 24, 2020

Final summer term payment deadline. Any balance owing on your student account will prevent access to registration for future terms.

Holds will be placed on unpaid summer accounts, which will prevent access to marks and/or registration for the 2020-21 Fall/Winter course selection. Payment of fees is due by the [posted deadlines](#).

July 1, 2020

Statutory holiday. University closed.

July 2, 2020

Late summer courses begin.

Full summer courses resume.

Late charges take effect at 12:00 a.m. (midnight) for students registering **only** in late summer courses (July-August courses). Payment of fees is due by the [posted deadlines](#).

July 9, 2020

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

July 17, 2020

Last day for a full fee adjustment when withdrawing from late summer courses (financial withdrawal).

July 17-19, 2020

Early summer term deferred final examinations to be held.

July 24, 2020

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, 2020

Last day for graduate students to submit their supervisor-approved thesis, in examinable form to the department.

August 3, 2020

Civic holiday. University closed.

August 7, 2020

Last day for summative tests or examinations, or formative tests or examinations totalling 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, 2020

Summer term financial holds preventing access to grades through Carleton Central and the release of official documents will be applied to accounts with an outstanding balance.

Last day of **late** summer and **full** summer classes.

Classes follow a Monday schedule.

Last day for academic withdrawal from **late** summer and **full** summer courses and any other courses that end this term.

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

August 15-16, 2020

No classes or examinations take place

August 17-23, 2020

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

August 23, 2020

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 18-20, 2020

Late summer and **full** summer term deferred final examinations will be held.