

# Course outline

## PHYS 1001-A: Foundation of Physics- Fall 2020

### Lectures

**Instructor:** Thomas Grégoire (gregoire@physics.carleton.ca)

**Office Hours:** TBD

**Course Modality:** This course is an online course where there is a mixture of synchronous meetings and asynchronous activities. The course material will be provided in short videos posted on CuLearn and in the textbook. During the live sessions the material will be reviewed but emphasis will be put on examples and interactions with the students. Attending the live sessions is strongly encouraged but will be mandatory only for the midterms.

**Live Sessions:** Tuesday and Thursday 1:05 pm - 2:25 pm, BigBlueButton (The live sessions will be recorded.)

First session on Thursday Sept. 10, 2020 last class on Thursday December 10, 2020.

**Prerequisites:** Prerequisite(s): 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. Please see me if you don't have Grade 12 physics

**Required textbook:** Raymond A. Serway and John W. Jewett Jr, "Physics for Scientists and Engineers with modern physics", 10th edition, ISBN 978-1-337-55329-2. Volume 1 will be used for 1001 and volume 2 for 1002.

<https://www.cengage.ca/shop/>

**Web** We will use CuLearn([www.carleton.ca/culearn/](http://www.carleton.ca/culearn/)) as the course website.

**Course content** • Ch. 1: Physics and Measurement

- Ch 2.: Motion in One Dimension
- Ch 3: Vectors
- Ch 4: Motion in Two Dimensions
- Ch: 5: The Laws of Motion
- Ch 6: Circular Motion
- Ch 7: Energy of a System
- Ch 8.: Conservation of Energy
- Ch 9.: Linear Momentum and Collisions
- Ch 10: Rotation of Rigid Body
- Ch 11: Angular Momentum
- Ch 12: Static Equilibrium
- Ch 15: Oscillatory Motion

## Learning Outcome A the end of the course:

- At an introductory level, students will be able to recall and utilize foundational knowledge in calculus-based classical mechanics, including kinematics, dynamics, gravitation, and oscillatory motion. In more details, the students will be able to:
  - Analyse motion using calculus and linear algebra (vectors)
  - Understand Newton’s laws of motion and be able to apply them to solve simple kinematic problems with constant force such as friction forces, tension forces, normal forces and gravitational forces.
  - Be able to analyze to solve problems using the concept of conservation of energy and momentum
  - Be able to analyze rotational motion using angular coordinates.
  - Be able to analyze rotational motion using conservation of angular momentum
  - Be able to analyze oscillatory motion such as the motion produced by a spring.
- students will have developed basic problem solving skills in calculus-based mechanics, and be able to use appropriately the tools of physics, calculus, and algebra. In the lab, students will be able to generate justifiable uncertainty estimates for experimental results.
- students will have developed basic written communication skills for reporting lab work and their analysis of solved problems.

## Labs and Tutorial

The labs are run independently of the lectures and are under the supervision of the lab instructor.

**Lab Instructor:** Igor Ivanovic, [igor@physics.carleton.ca](mailto:igor@physics.carleton.ca)

**Lab sections** A1: Wednesday 2:35pm- 5:25pm,  
A2: Friday 11:35am - 2:25 pm,  
A4: Monday 8:35am - 12:25pm,  
Labs and tutorial start on the week of September 14.

**Lab manual** Will be on CuLearn website.

## Assessment

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

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

**Use of e-Proctoring system:** This course has timed written assessments, which may consist of tests, midterms and/or final examinations. The Carleton University e-Proctoring system may be used in your assessments, and requires the use of webcams, microphones, and smart phones.

**Reading quizzes (5 %):** There will be short weekly reading quizzes. These will be multiple choice conceptual questions and will be give through CuLearn. You will be notify in advance of any quizz.

**Labs (20%)**

**Tutorial tests(5%)** On designated weeks, a short test will be given at the end of tutorial.

**Homework assignments (25 %):** One homework will be assign roughly every week in class. It will be due the following week. To submit your homework you will need to take pictures of your problem set and send it as one PDF. Make sure your document is legible before you send it. I strongly suggest the use of a scanning app. You are encouraged to discuss the concepts and strategies relative to the assignments together, but the work that is handed in **must be your own**. Late assignment will not be accepted without an acceptable reason. Note: Viewing or searching for solutions to the problems in any form before your assignment is submitted is forbidden and will be considered an academic offence. This includes solution manuals, worked problems on the internet, solutions written by other students, and solutions provided by course instructors in previous years.”

**Midterm (20 %):** There will be two one hour midterm during the live sessions. This will be an open book exam (no internet), and a formula sheet will be provided. One midterm will be multiple choice, and the other will require solving problems.

**Final (25 %):** The final exam will be 3 hours long and will be held during the final exam period. It will be open book(no internet), and a formula sheet will be provided. It will be half multiple choice and half problems.

**Policies** In general, missed assignments, tutorial tests, midterm or labs will be given the grade 0 unless a valid reason such as a doctor note is provided to the instructor or lab supervisor.

## Useful informations

**Website** cuLearn will be used as the course website.

**Academic policy:** 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:  
<http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/>

**Plagiarism :** Plagiarism is the passing off of someone else’s work as your own and is a serious academic offence. For the details of what constitutes plagiarism, the potential penalties and the procedures refer to the policies on academic integrity <https://carleton.ca/secretariat/wp-content/uploads/Academic-Integrity-Policy.pdf>

### **What are the penalties for Plagiarism?**

A student found to have plagiarized an assignment may be subject to one of several penalties including: expulsion; suspension from all studies at Carleton; suspension from full-time studies; and/or a reprimand; a refusal of permission to continue or to register in a specific degree

program; academic probation; award of an FNS, Fail, or an ABS.

### **What are the Procedures?**

All allegations of plagiarism are reported to the Dean's office. Documentation is prepared by instructors and/or departmental chairs. The Dean writes to the student and the University Ombudsperson about the alleged plagiarism. The Dean reviews the allegation. If it is not resolved at this level then it is referred to a tribunal appointed by the Senate.

### **Faculty of Science penalties for violation of the Carleton policies on academic integrity (1st year students)**

- First offence: No credit for assessment(s) in question, or a final grade reduction of one full letter grade (e.g., A- becomes B-), whichever is a greater reduction.
- Second offence: A grade of F in the course and a one-term suspension from studies.
- Third offence: Expulsion from the University

Note: stronger penalties can be imposed at the discretion of the Associate Dean.

**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:** Pregnant students requiring academic accommodations are encouraged to contact an Equity Advisor in Equity Services to complete a letter of accommodation. The student must then make an appointment to discuss her needs with the instructor at least two weeks prior to the first academic event in which it is anticipated the accommodation will be required.
- **Religious obligation:** Students requesting academic accommodation on the basis of religious obligation should make a formal, written request to their instructors for alternate dates and/or means of satisfying academic requirements. Such requests should be made during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist, but no later than two weeks before the compulsory event. Accommodation is to be worked out directly and on an individual basis between the student and the instructor(s) involved. Instructors will make accommodations in a way that avoids academic disadvantage to the student. Students or instructors who have questions or want to confirm accommodation eligibility of a religious event or practice may refer to the Equity Services website for a list of holy days and Carleton's Academic Accommodation policies, or may contact an Equity Services Advisor in the Equity Services Department for assistance.
- **Students with disabilities requiring academic accommodations** 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](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send 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). \*The deadlines for contacting the Paul Menton

Centre regarding accommodation for final exams for the Fall exam period is November 8, 2019 and for the Winter exam period is March 13, 2020.

**Assistance for students:** The following resources might be useful :

- 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/>
- Science Student Success Centre: <https://sssc.carleton.ca/>
- Math Tutorial Centre: <https://carleton.ca/math/math-tutorial-centre/>

**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).

- Students must always retain a hard copy of all work that is submitted.
- 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.