

COURSE OUTLINE – PHYS 2203

Astronomy – Fall 2022

Professor: Simon Viel (he/him) – Address by first name!

Office: 3370 Herzberg Laboratories, Department of Physics

E-mail: sviel@physics.carleton.ca
Please include “PHYS2203” in the subject line.

Teaching assistant: Jeremie LePage-Bourbonnais

Student hours: Mondays after class, and by appointment

Class time: Mondays and Wednesdays, 13:05 – 14:25

Class location: TB 447

First day of class: Wednesday September 7, 2022

Official course description: The observational basis of astronomy.
The history of astronomy, properties of light, solar system observations and stellar astronomy.

Prerequisites: PHYS 1002 or PHYS 1004 or permission of the department.
PHYS 1008 with a grade of B- or better may also be used if MATH 1004 or MATH 1007 or MATH 1002 have been successfully completed.

Textbook: *Foundations of Astrophysics*, by Ryden and Peterson
Available at the University Bookstore

Communication policy: Students are responsible for reading and responding to information distributed on the Brightspace course page. Please make sure to check the course page regularly!
Also feel free to email me at the address given above.
All online communications should respect “Netiquette”:
<https://carleton.ca/online/online-learning-resources/netiquette/>

Evaluation: Reading Quiz Participation (5%)
Astronomy Heroes Activity (5%)
Assignments (35%)
Midterm Exam (20%)
Final Exam (35%)

Course Timeline (Tentative):

Before the first class on each topic, please read the corresponding chapters indicated.

* indicates tentative homework assignment hand-out dates (due the following Wednesday)

<i>Class dates</i>	<i>Textbook chapters</i>	<i>Topics</i>
September 7	-	Course Introduction, Tour of the Universe
September 12, 14	Chapter 1	Sky Motions, Seasons, Lunar Phases
September 19	Chapter 2	History: Astronomy Heroes
September 21*, 26, 28*	Chapter 3	Kepler's Laws, Newton's Laws, Orbital Mechanics
October 3	Chapter 4	Earth-Moon System, Tides
October 5*	Chapter 5	Interaction of Light and Matter, Doppler Effect
October 10	Chapter 6	Telescopes
October 12	Chapter 7	Radiometric Dating, The Sun
October 17	-	Review
October 19	-	Midterm Exam
October 24-28	Chapters 13-15	Reading Week
October 31	-	Dark Matter Day
November 2*	Chapter 8	Overview of the Solar System
November 7, 9*	Chapters 9, 10	Planetary Geology, Magnetism, Surfaces, Atmospheres, Climate
November 14, 16*, 21	Chapters 11, 12	Jovian Planets, Moons and Rings, Asteroids, Comets, Dwarf Planets, Exoplanets
November 23*, 28, 30*	Chapters 17, 18	Introduction to Stellar Astronomy, Stellar Evolution, Stellar Remnants
December 5	Chapters 19, 20	Introduction to Galaxies and the Foundation of Modern Cosmology
December 7	Chapter 23	Astroparticle Physics, Multi-Messenger Astronomy
Friday December 9	-	Review
December 10-22 (TBD)	-	Final Exam

Kessler Observatory (Optional):

We are back in person! Students are encouraged to attend observation sessions organized by Callan Jessiman at the Kessler Observatory, located on top of the Herzberg Laboratories at Carleton: physics.carleton.ca/observatory

Feel free to register to the mailing list linked there! Further information including observation schedules will be communicated in class. Also the Carleton Astronomy channel on YouTube is here: <https://www.youtube.com/channel/UC7xaKeJFtL04KBChASY09pQ>

Assessment Activities:

Research about learning strongly suggests that **the most important factor in learning is doing the work** of reading, writing, recalling, practicing, synthesizing, and analyzing. Learning happens best when people actively engage material on a consistent basis, and that is why we have high standards in this course. We are confident that, with appropriate effort, you all can meet those standards.

Informal Pre-Test

Many students will already have some knowledge of astronomical concepts before this class even starts. The goal of the informal pre-test, handed out on the first day of class, is to assess this level of prior knowledge in order to better tailor the material presented during this course to you. Expect to not know most of the answers: you will learn them in this class! This activity does not impact your final grade in any way.

Reading Quiz Participation (5%)

On twelve weeks during the term, a Reading Quiz will be handed out about the topics covered in the reading assignment for the following week (refer to the Tentative Course Timeline above). The main goal of the reading assignments and quizzes is to prepare you for the corresponding week's lectures: please take them seriously.

The material in each Reading Quiz will not yet have been seen in class, but can be found in that week's reading assignment. Grades for this activity are based on participation, each Reading Quiz being worth 0.5% towards your final grade, up to a maximum of 5% in total. It is advised to re-try each Reading Quiz until you get a perfect score.

Astronomy Heroes (5%)

In previous years, the historical segment of the course was based on the textbook chapter. This year, we will have the third edition of the Astronomy Heroes activity. On a single presentation slide, each student is asked to:

- Identify a scientist as your hero
- Identify their contributions to astronomy
- Explain your rationale for choosing them

This slide is **due on September 14, 2022**. Then on Monday September 19, each student will give a 1-minute presentation in class, followed by a brief questions and answers period.

This activity will be graded on originality in the choice of scientist, relevance to the course, quality of the slide and quality of the presentation.

Please cite all your sources on the slide. Originality for this activity is defined with respect to the standard textbook history of astronomy, not with respect to other students in the class (i.e. multiple students may choose the same scientist).

Assignments (35%)

Written homework problems will be assigned on eight Wednesdays during the term, and they will be due at the beginning of class on Wednesday the week after they were assigned. Each assignment is expected to require at most 5 hours of work. All the material you need to solve them will have been presented in class: Google searches are strongly discouraged.

You are encouraged to study together, and write separately. **The work you hand in must be your own.** Replicated / copied / plagiarized assignments will receive a grade of zero.

Grade flexibility: Each student's homework assignment with the lowest percentage grade (except for disciplinary reasons) will not be considered when calculating the contribution of homework assignments to the final grade.

Midterm Exam (20%)

The midterm exam will be during the regular lecture period on Wednesday October 19. The midterm exam will be closed book and closed notes. A formula sheet will be provided.

If the final exam percentage grade is higher than the midterm exam grade, then the midterm exam will receive a percentage grade equal to that of the final exam. The final exam is expected to be harder than the midterm exam, so do not rely on this!

Final Exam (35%)

There will be a 3-hour written final exam, during the final examination period in December. The final exam will be closed book and closed notes. A formula sheet will be provided.

The final exam is a requirement to successfully complete this course.

Land Acknowledgement

Here at Carleton University, it is important that we acknowledge that the land on which we gather is the traditional and unceded territory of the Algonquin nation.

Special Information Regarding COVID-19

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are [a number of actions you can take](#) to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you're sick, washing your hands and maintaining proper respiratory and cough etiquette.

Feeling sick? Remaining vigilant and not attending work or school when sick or with symptoms is critically important. If you feel ill or exhibit COVID-19 symptoms do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you must follow Carleton's [symptom reporting protocols](#).

Masks: Carleton has paused the [COVID-19 Mask Policy](#), but continues to strongly recommend masking when indoors, particularly if physical distancing cannot be maintained. It may become necessary to quickly reinstate the mask requirement if pandemic circumstances were to change.

Vaccines: Further, while proof of vaccination is no longer required as of May 1 to attend campus or in-person activity, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible, and submit their booster dose information in [cuScreen](#) as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID-19 response and health and safety requirements please see the [University's COVID-19 website](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca.

Note About COVID-19 & Mental Health

The global pandemic has led to extra stress and uncertainty. If you are struggling, please do not hesitate to reach out. I am happy to listen, and/or direct you to resources that might help. In terms of class, if you need extra help or missed a lesson, don't stress! **Email me** and we will set a time to meet. I'll work with you, I promise. Remember that Carleton also offers an array of mental health and well-being resources, which can be found [here](#).

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

ABS = Student absent from final exam

DEF = Deferred

FND = (Failed, no Deferred) = student could not pass even with 100% on final exam

Academic Accommodations, Regulations, Plagiarism, Etc.

Carleton University is committed to providing access to the educational experience in order to promote academic accessibility for all individuals.

Academic accommodation refers to educational practices, systems and support mechanisms designed to accommodate diversity and difference. The purpose of accommodation is to enable students to perform the essential requirements of their academic programs. At no time does academic accommodation undermine or compromise the learning objectives that are established by the academic authorities of the University. More information can be found at: <https://students.carleton.ca/course-outline/>

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:

<https://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/>

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. For more details, visit the [Paul Menton Centre website](#).

Carleton University has launched a new academic accommodation management system, [Ventus](#). Ventus provides students with more control over their accommodations on a per-course and per-test basis, and creates an improved user experience for students and faculty with real-time data in one shared web location. Students can request and manage their academic accommodations via the [Ventus Student Portal](#). More information on using Ventus can be found on [VentusHelp](#).

Addressing Human Rights Concerns

The University and all members of the University community share responsibility for ensuring that the University's educational, work and living environments are free from discrimination and harassment. Should you have concerns about harassment or discrimination relating to your age, ancestry, citizenship, colour, creed (religion), disability, ethnic origin, family status, gender expression, gender identity, marital status, place of origin, race, sex (including pregnancy), or sexual orientation, please contact the Department of Equity and Inclusive Communities at equity@carleton.ca.

Religious Obligations

Please contact me 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, please review the Student Guide to Academic Accommodation (PDF, 2.1 MB).

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 where 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: <https://carleton.ca/sexual-violence-support/>

Accommodations for Missed Work

Carleton recognizes that these are unprecedented times during the COVID-19 pandemic, and that students may be experiencing greater stress and other life factors that are not in their control. As a result, Carleton has put into place a protocol for students to apply for accommodations using a self-declaration form in the event of missed work. The form can be found at: <https://carleton.ca/registrar/wp-content/uploads/self-declaration.pdf>

For Pregnancy

Please contact me 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, please review the Student Guide to Academic Accommodation.

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 me 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, see the Senate Policy on Accommodation for Student Activities.

Academic Integrity

Academic misconduct undermines the values of honesty, trust, respect, fairness, and responsibility that we expect in this class. Carleton University provides supports such as academic integrity workshops to ensure, as far as possible, that all students understand the norms and standards of academic integrity that we expect you to uphold. Your teaching team has a responsibility to ensure that their application of the Academic Integrity Policy upholds the university's collective commitments to fairness, equity, and integrity.

(adapted from Carleton University's Academic Integrity Policy, 2021).

Examples of actions that do not adhere to Carleton's Academic Integrity Policy include:

- Plagiarism
- Accessing unauthorized sites for assignments or tests
- Unauthorized collaboration on assignment and exams

Sanctions for not abiding by Carleton's Academic Integrity Policy

A student who has not adhered to Carleton's Academic Integrity Policy may be subject to one of several sanctions:

1. If you take full responsibility for your actions, and it is the first time you have violated the policy, you will receive zero on the assessment. If you are found to have violated the policy but do not take responsibility, an additional grade deduction will be applied (e.g. an A- will become a B+)
2. Subsequent violations of the policy may result in more severe sanctions such as failing the course, suspension from all studies and/or expulsion.

Process of an Academic Misconduct Investigation

Step 1: The instructor believes misconduct has occurred and submits documentation to the Dean of the Faculty of Science.

Step 2: The Dean reviews documentation and can proceed with or dismiss the allegation.

Step 3: If sufficient evidence, the student receives an allegation statement by email. Ombuds services is copied on the email.

Step 4: The student provides a written response to the evidence provided.

Step 5: Either party may request a meeting between student, dean, and the ombudsperson.

Step 6: Dean informs the student of the decision.

Appeal: Student has the right to appeal the decision.

Additional details about this process can be found on the [Faculty of Science Academic Integrity website](#). Students are expected to familiarize themselves with and follow the Carleton University [Student Academic Integrity Policy](#). The Policy is strictly enforced and is binding on all students.

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, refer the [Faculty of Science Academic Integrity website](#). To further understand Academic Integrity, consider attending the [Learning and Support Academic Integrity Workshop](#).

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?

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

Students are expected to familiarize themselves with and follow the Carleton University [Student Academic Integrity Policy](#). The Policy is strictly enforced and is binding on all students.

Assistance for Students

The Office of the Vice-President (Students and Enrolment) offers a full package of tools and resources, such as Supporting Students in Distress and the Student Referral Guide, to assist you in helping students achieve their academic, personal and professional potential at carleton.ca/studentssupport.

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/>

Math Tutorial Centre: <https://carleton.ca/math/math-tutorial-centre/>

Science Student Success Centre: <https://sssc.carleton.ca/>