

## COURSE OUTLINE – PHYS 2203

### Astronomy – Fall 2021

**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:** TBA

**Student hours:** Online, by appointment + Fridays after class

**Class time:** Wednesdays and Fridays, 14:35 – 15:55

**Class location:** Online

**First day of class:** Wednesday September 8, 2021

**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.  
This eTextbook is available here:  
<https://www.amazon.com/Foundations-Astrophysics-Barbara-Ryden-ebook/dp/B08GGCQFZ3/>

**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 Exams (2 times 10% each)  
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><b>Class dates</b></i>	<i><b>Textbook chapters</b></i>	<i><b>Topics</b></i>
September 8	-	Course Introduction, Tour of the Universe
September 10, 15	Chapter 1	Sky Motions, Seasons, Lunar Phases
September 17	Chapter 2	History: <b>Astronomy Heroes</b>
September 22*, 24	Chapter 3	Kepler's Laws, Newton's Laws, Orbital Mechanics
September 29*	Chapter 4	Earth-Moon System, Tides
October 1, 6	Chapter 5	Interaction of Light and Matter, Doppler Effect
October 8	-	<b>Midterm Exam #1</b>
October 13*	Chapter 6	Telescopes
October 15, 20, 22	Chapters 7, 8	Overview of the Solar System, Radiometric Dating, The Sun
October 25-29	Chapters 13-15	<b>Reading Week</b>
November 3*, 5	Chapters 9, 10	Planetary Geology, Magnetism, Surfaces, Atmospheres, Climate
November 10*, 12	Chapters 11, 12	Jovian Planets, Moons and Rings, Asteroids, Comets, Dwarf Planets, Exoplanets
November 17*	-	<b>Midterm Exam #2</b>
November 19, 24*, 26	Chapters 17, 18	Introduction to Stellar Astronomy, Stellar Evolution, Stellar Remnants
December 1*	Chapters 19, 20	Introduction to Galaxies and the Foundation of Modern Cosmology
December 3	Chapter 23	Dark Matter, Astroparticle Physics, Multi-Messenger Astronomy
December 8	-	Review
December 11-23 (TBD)	-	<b>Final Exam</b>

## **Synchronous Course:**

This course is a real-time, online course where the instructor and students meet via web conferencing tools, at scheduled days and times. Instructors and students share information, ideas and learning experiences in a virtual course environment.

Participation in synchronous courses requires students to have reliable, high-speed internet access, a computer, and a headset with a microphone.

## **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.

### ***Astronomy Heroes (5%)***

In previous years, the historical segment of the course was based on the textbook chapter. This year, we are introducing a new activity. On a single presentation slide, each student will be 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 15**. Then on Friday September 17, 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.

### ***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 Exams (2 times 10% each)***

In this online class there will be two short written exams, during the regular lecture periods on Friday October 8 and Wednesday November 17. These exams will be will be open book and open notes. A formula sheet will be provided.

### ***Final Exam (35%)***

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

**For exams it is forbidden to: use unauthorized aids, look up any information online, consult with any other person, or share exam content with anyone.**

### **Kessler Observatory (Temporarily Closed):**

Under normal circumstances, students would be encouraged to attend observation sessions at the Kessler Observatory, located on top of the Herzberg Laboratories at Carleton:  
[physics.carleton.ca/observatory](https://physics.carleton.ca/observatory)

Regrettably this term, it will not be possible to schedule observation sessions in this course. Feel free to register to the mailing list linked there in any case, to receive emails when the Kessler Observatory will reopen.

The Carleton Astronomy channel on YouTube is here:

<https://www.youtube.com/channel/UC7xaKeJFtL04KBChASY09pQ>

## 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

All members of the Carleton community are required to follow COVID-19 prevention measures and all mandatory public health requirements (e.g., wearing a mask, physical distancing, hand hygiene, respiratory and cough etiquette) and mandatory self-screening prior to coming to campus daily.

If you feel ill or exhibit COVID-19 symptoms while on campus or in class, please leave campus immediately, self-isolate, and complete the mandatory symptom reporting tool. For purposes of contact tracing, attendance will be taken in all classes and labs. Participants can check in using posted QR codes through the cuScreen platform where provided. Students who do not have a smartphone will be required to complete a paper process as indicated on the COVID-19 website.

All members of the Carleton community are required to follow guidelines regarding safe movement and seating on campus (e.g., directional arrows, designated entrances and exits, designated seats that maintain physical distancing). In order to avoid congestion, allow all previous occupants to fully vacate a classroom before entering. No food or drinks are permitted in any classrooms or labs.

For the most recent information about Carleton's COVID-19 response and required measures, please see the University's COVID-19 webpage and review the Frequently Asked Questions (FAQs). Should you have additional questions after reviewing, please contact [covidinfo@carleton.ca](mailto:covidinfo@carleton.ca).

Please note that failure to comply with University policies and mandatory public health requirements, and endangering the safety of others are considered misconduct under the Student Rights and Responsibilities Policy. Failure to comply with Carleton's COVID-19 procedures may lead to supplementary action involving Campus Safety and/or Student Affairs.

## 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](#).

## **Children & Synchronous Sessions**

You are welcome to have children with you during lectures: I fully understand that childcare situations may be complicated for many of us at this time. Do your best to participate and engage, but also please get in touch with me if you have any questions or concerns.

## **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](mailto: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](#).

## **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](mailto: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

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/>