



## COURSE OUTLINE

### 1. **Course:** ASTR 209, Introduction to Astronomy II - The Cosmos - Winter 2021

Lecture 01: TR 15:30 - 16:45 - Online

<b>Instructor</b>	<b>Email</b>	<b>Phone</b>	<b>Office</b>	<b>Hours</b>
Dr Philip Langill	pplangil@ucalgary.ca	403 220-5402	SA 101B	See below

In this course you will learn about deep space, astrophysics of stars, nebulae, and galaxies. The conditions in space often defy our intuition. Most of the universe is invisible to the human eye. We will explore how physics allows us to learn about things that we cannot see and cannot touch. Some of the challenges of this course are the diversity of the material and the level of abstract thinking that comes with studying things that are 10,000,000,000,000,000,000 times bigger, and smaller, than yourself.

#### **Online Delivery Details:**

This course is being offered online in real-time via scheduled meeting times, you are required to be online at the same time.

To help ensure Zoom sessions are private, do not share the Zoom link or password with others, or on any social media platforms. Zoom links and passwords are only intended for students registered in the course. Zoom recordings and materials presented in Zoom, including any teaching materials, must not be shared, distributed or published without the instructor's permission.

This course has a registrar scheduled, synchronous final exam. The writing time is 2 hours + 50% buffer time.

All ASTR209 classes will be facilitated using the Zoom online platform at the days and time scheduled by the Registrar's Office. The required Zoom link and password will be posted on D2L. To be allowed into these online classes students are required to use their actual names and associated ucalgary e-mail address.

These online Zoom classes will be recorded and posted on D2L. They will include real-time questions administered via the TopHat online classroom response system.

#### **Course Site:**

D2L: ASTR209L01W21 - Introduction to The Cosmos

TopHat: [www.tophat.com](http://www.tophat.com)

**Note:** Students must use their U of C account for all course correspondence.

Dr. Langill's Office Hours for Astr209 will be Wednesdays from 1 to 3 pm. It may be necessary to change this occasionally due to scheduling conflicts. If any changes are eminent, new office hours will be communicated via D2L and/or during lecture.

### 2. **Requisites:**

See section [3.5.C](#) in the Faculty of Science section of the online Calendar.

Math is the language by which we formulate the laws of physics and on which our understanding of the cosmos is built. Math will be used in this course to illustrate how we discover details about the universe.

The exams will contain questions that test knowledge and insight. The exams will also include some math questions.

### 3. **Grading:**

The University policy on grading and related matters is described in [F.1](#) and [F.2](#) of the online University Calendar.

In determining the overall grade in the course the following weights will be used:

Component(s)	Weighting %	Date
Mastering Astronomy Assignments (7)	35	
Midterm Exam	25	March 4, 2021
Final exam (scheduled by Registrar's Office)	30	TBA
Activities and In-class TopHat questions (5% each)	10	

Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

The conversion between a percentage grade and letter grade is as follows.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
<b>Minimum % Required</b>	93 %	85 %	80 %	75%	70%	65 %	60 %	55%	50%	45 %	40 %

The percentage grades required to earn a particular letter grade for the course are strict minimum thresholds applied to the weighted mean percentage course grade. There is no rounding. For example, a mean percentage grade of 79.99% for the course translates into a letter grade B+.

Assignments are due at 23:59 on the due date. After this due-time, the maximum attainable grade decreases gradually to zero over a 24 hour period.

This course will have a final exam that will be scheduled by the Registrar. [The Final Examination Schedule](#) will be published by the Registrar's Office approximately one month after the start of the term. The final exam for this course will be designed to be completed within 2 hours.

The final exam will be administered using an on-line platform. Per section [G.5](#) of the online Academic Calendar, timed final exams administered using an on-line platform, such as D2L, will be available on the platform. **Due to the scheduling of the final exams, the additional time will be added to the end of the registrar scheduled synchronous exam to support students. This way, your exam schedule accurately reflects the start time of the exam for any synchronous exams. E.g. If a synchronous exam is designed for 2 hours and the final exam is scheduled from 9-11am in your student centre, the additional time will be added to the end time of the synchronous exam. This means that if the exam has a 1 hour buffer time, a synchronous exam would start at 9 am and finish at 12pm.** - updated April 6, 2021

Each student shall register only one single account in Mastering Astronomy and one single account in TopHat. Duplicate accounts associated with the same student ID will be removed, and this may result in loss of credit for one or more course components.

**Any missed component of course work receives a zero grade .**

All students are required to participate in the TopHat interactive questions presented in Zoom online classes.

**4. Missed Components Of Term Work:**

The university has suspended the requirement for students to provide evidence for absences. Please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations.

In the event that a student legitimately fails to submit any online assessment on time (e.g. due to illness etc...), please contact the course coordinator, or the course instructor if this course does not have a coordinator to arrange for a re-adjustment of a submission date. Absences not reported within 48 hours will not be accommodated. If an excused absence is approved, then the percentage weight of the legitimately missed assignment could also be pro-rated among the components of the course.

**5. Scheduled Out-of-Class Activities:**

There are no scheduled out of class activities for this course.

## 6. Course Materials:

Required Textbook(s):

Bennett, Donahue, Schneider, Voit, *The Cosmic Perspective: Stars, Galaxies, and Cosmology, 9th edition* Pearson.

Be sure to get the correct text book. This is part 2 of a larger text book. You only need the Stars, Galaxies, and Cosmology section for ASTR 209.

Lecture notes will be posted on D2L after the lecture. Exams can include material from the text book and the assignments that is not included in the lecture notes. It is therefore not advisable to study only from the lecture notes. Lecture notes can also add material that is not covered by the text book.

Homework assignments are done online through the Mastering Astronomy tool provided by the textbook publisher. You may already have access to Mastering Astronomy from a previous course. Check if an access code is included when you purchase a new copy of the text.

Details about gaining access to Mastering Astronomy will be discussed in lecture.

We will use the TopHat in-class participation technology. Details of this are provided elsewhere in this outline and on D2L, and will be discussed in lecture.

In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology:

- A computer with a supported operating system, as well as the latest security, and malware updates;
- A current and updated web browser;
- Webcam/Camera (built-in or external);
- Microphone and speaker (built-in or external), or headset with microphone;
- Current antivirus and/or firewall software enabled;
- Stable internet connection.

For more information please refer to the UofC [ELearning](#) online website.

## 7. Examination Policy:

The midterm and final exams are 'open-resource' exams meaning students can use the **sanctioned resources** that will help them to complete the exams **INDIVIDUALLY**. Collaboration is not permitted.

By entering into the online exams in this course, students are making a declaration that they are working by themselves, with only the aid of the course textbook, lecture notes, and other course approved online resources, AND with NO third party tools such as file sharing websites, texting and other communication apps, and services that are not affiliated with the University of Calgary.

Students should also read the Calendar, [Section G](#), on Examinations.

## 8. Approved Mandatory And Optional Course Supplemental Fees:

There are no mandatory or optional course supplemental fees for this course.

## 9. Writing Across The Curriculum Statement:

For all components of the course, in any written work, the quality of the student's writing (language, spelling, grammar, presentation etc.) can be a factor in the evaluation of the work. See also Section [E.2](#) of the University Calendar.

## 10. Human Studies Statement:

Students will not participate as subjects or researchers in human studies.

See also [Section E.5](#) of the University Calendar.

## 11. Reappraisal Of Grades:

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See [Section I.3](#) of the University Calendar.

- a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **ten business days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall submit the Reappraisal of Graded Term work form to the department in which the course is offered within 2 business days of receiving the decision from the instructor. The Department will arrange for a reappraisal of the work within the next ten business days. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. See sections [I.1](#) and [I.2](#) of the University Calendar
- b. **Final Exam:** The student shall submit the request to Enrolment Services. See [Section I.3](#) of the University Calendar.

## 12. Other Important Information For Students:

- a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, [Mental Health Services Website](#)) and the Campus Mental Health Strategy website ([Mental Health](#)).
- b. **SU Wellness Services:** For more information, see [www.ucalgary.ca/wellnesscentre](http://www.ucalgary.ca/wellnesscentre) or call [403-210-9355](tel:403-210-9355).
- c. **Sexual Violence:** The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email ([syva@ucalgary.ca](mailto:syva@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208). The complete University of Calgary policy on sexual violence can be viewed at (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>)
- d. **Misconduct:** Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity. Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional [Code of Conduct](#) and promote academic integrity in upholding the University of Calgary's reputation of excellence. Some examples of academic misconduct include but are not limited to: posting course material to online platforms or file sharing without the course instructor's consent; submitting or presenting work as if it were the student's own work; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. Please read the following to inform yourself more on academic integrity:

[Student Handbook on Academic Integrity](#)  
Student Academic Misconduct [Policy](#) and [Procedure](#)  
[Research Integrity Policy](#)

Additional information is available on the [Student Success Centre Academic Integrity page](#)

- e. **Academic Accommodation Policy:** Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the procedure for accommodations for students with disabilities available at [procedure-for-accommodations-for-students-with-disabilities.pdf](#).

Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head of the Department of Physics & Astronomy, Dr. David Feder by email [phas.ahugrd@ucalgary.ca](mailto:phas.ahugrd@ucalgary.ca) or phone 403-220-8127. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See [Section E.4](#) of the University Calendar.

- f. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). Students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information,

see [Legal Services](#) website.

- g. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](#) Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](#) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). [Student Ombudsman](#), Email: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca).
- h. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction ([USRI](#)) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.
- i. **Copyright of Course Materials:** All course materials (including those posted on the course D2L site, a course website, or used in any teaching activity such as (but not limited to) examinations, quizzes, assignments, laboratory manuals, lecture slides or lecture materials and other course notes) are protected by law. These materials are for the sole use of students registered in this course and must not be redistributed. Sharing these materials with anyone else would be a breach of the terms and conditions governing student access to D2L, as well as a violation of the copyright in these materials, and may be pursued as a case of student academic or [non-academic misconduct](#), in addition to any other remedies available at law.

#### Syllabus

Observing the Cosmos. Structure of the Sun and stars. Properties of stars. Parallax, luminosity, Stefan-Boltzmann law, Hertzsprung-Russell diagram. Stellar evolution and nucleosynthesis. End stages of stellar evolution. Black holes and gravitational waves. Structure of the Milky Way. Interstellar matter. Galaxies and clusters of galaxies. Galaxy evolution. Cosmology.

#### Course Outcomes:

- Students will know how observations of radiation across the electromagnetic spectrum contribute to our knowledge of the cosmos.
- Students will learn to apply physical principles such as black body radiation, spectral analysis, the Doppler effect, parallax, and the force of gravity to objects in the cosmos.
- Students will demonstrate critical judgment about applicable media reports, scientific methods and theories.
- Students will be able to identify the building blocks of the cosmos and their interrelations.

Electronically Approved - Apr 06 2021 16:55

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#### Department Approval