



**REVISED COURSE OUTLINE FOR REMOTE LEARNING**

To account for the necessary transition to remote learning from March 13 onward, adjustments have been made to assessment deadlines and requirements so that all coursework tasks are in line with the necessary and evolving health precautions for all involved (students and staff). If you are unable to meet the deadlines or requirements specified, please connect with your course instructor to work out alternative dates/assessments.

1. **Course:** ASTR 209, Intro To Astr II - The Cosmos - Winter 2020

Lecture 01: TR 15:30 - 16:45 - Remote Learning (check with your instructor or coordinator for details)

Instructor	Email	Phone	Office	Hours
Dr Philip Langill	pplangil@ucalgary.ca	403 220-5402	SA 101B	TR, 1:00 - 2:00 pm

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 100,000,000,000,000,000,000 times bigger than yourself.

**Course Site:**

D2L: ASTR 209 L01-(Winter 2020)-Intro To Astr II - The Cosmos

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

2. **Requisites:**

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

Math is the language in which we formulate the laws of physics on which our understanding of the cosmos is built. Math is used in this course to illustrate how we find out 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 %
Mastering Astronomy + Tophat Assignments (7)	42
Midterm exam in class <b>Thursday, March 5</b>	25
Final exam*	28
In-class TopHat questions	5

\*See details at the end of the document for more information on the final exam

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 restrict 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 (see later in this course outline). After this due-time, the maximum attainable grade decreases gradually to zero over a 24 hour period.

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 TopHat interactive questions and activities completed in-class.

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

The University has suspended requirements for students to provide evidence for reasons for absences so please do not attend medical clinics for medical notes or Commissioners for Oaths for statutory declarations. Please let your instructor know immediately if you are ill and cannot meet the deadlines specified.

Missed components of term work receive a zero grade without exception. This includes late assignments. If a documented valid reason for missed work is provided a solution will be offered that may include transfer of weight or an opportunity to finish the work at a later date at the discretion of the instructor. Such accommodation will only be considered if the request is made at the earliest possible opportunity.

#### 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 in Mastering Astronomy. 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.

**You do not have to purchase access to Mastering Astronomy.** You can access the system free of charge from a computer on campus. Instructions are provided elsewhere in this outline and on D2L.

We will use TopHat in-class participation technology. You can participate with your own personal device using a web browser, text messaging or the TopHat App. Anyone who cannot participate in the TopHat in-class participation must inform the instructor before Friday, January 17, 2020.

#### 7. **Examination Policy:**

Exams will be closed book. The midterm and final exams are multiple choice exams. All course materials including set text book sections, homework assignments, slides and notes posted on D2L can be included in the exam. Questions will test knowledge, insight, and application skills. There will be some questions on the exams for which math is required.

**Use of a scientific calculator is allowed and highly recommended for exams.** Calculator Apps on portable devices with wireless communication are not allowed on exams. Use of any device with wireless capability, including smart watches, is not allowed on the exams.

**All exams are cumulative.**

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.

There are no requirements about the quality of writing in this course.

## 10. **Human Studies Statement:**

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

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

There are no human studies aspects associated with ASTR 209.

## 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 Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. 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 University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. 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 ([svsa@ucalgary.ca](mailto:svsa@ucalgary.ca)) or phone at [403-220-2208](tel:403-220-2208).
- d. **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's

approval; falsification/ fabrication of experimental values in a report. **These are only examples.**

- e. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- f. **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.
- g. **Safewalk:** Campus Security will escort individuals day or night (See the [Campus Safewalk](#) website). Call [403-220-5333](tel:403-220-5333) for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- h. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). 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.
- i. **Student Union Information:** [VP Academic](#), Phone: [403-220-3911](tel:403-220-3911) Email: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca). SU Faculty Rep., Phone: [403-220-3913](tel:403-220-3913) Email: [sciencerep@su.ucalgary.ca](mailto:sciencerep@su.ucalgary.ca). [Student Ombudsman](#), Email: [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca).
- j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- k. **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.
- l. **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.

### 1. If you need assistance.

Part of the challenge of ASTR 209 is amount of material that must be covered in a single term. Lecture notes are posted after a lecture, so you can keep up with the course.

Detailed course information will be posted on D2L.

**Email to the instructor is strictly for issues related to the organization of the course, or to book an appointment. Questions about course material cannot be effectively answered by email. Do not send scanned notes by email.**

Questions about course material can be asked immediately after class, during office hours, or by appointment. The instructor will make an effort to stay after lectures until all questions have been answered.

### 2. TopHat.

We will use TopHat in this course for learning activities. TopHat is available free of charge for registered students. The instructor will assume that you are familiar with TopHat. If you have any questions or problems, please ask the instructor.

**The course ID for TopHat is Astr209Winter2020. The join code is 555846.**

**You must have registered for the course in TopHat by Friday, January 17, 2020.** TH questions will be asked in-class prior to this, but those questions will be for-practice only and will not count toward your TH grade.

### 3. Homework assignments

There will be seven web-based homework assignments in MasteringAstronomy. Students can obtain access to the MasteringAstronomy system in one of the following ways (note - if you purchased MasteringAstronomy for another course you may not need to repurchase. See instructions posted on the ASTR209 D2L website):

1. **Access code with print package.** Purchase a new textbook at the Campus Bookstore. An Access code for MasteringAstronomy will be included. You will have access to the full MasteringAstronomy website which includes an electronic version of your textbook which can be used on a computer or in an app on your smart phone or tablet. It also includes access to the Study Area which includes video demonstrations, prep quizzes, simulations, app-based study modules and more.
2. **Digital access with the Electronic Text.** Purchase an electronic version of the text plus access to MasteringAstronomy. You will have access to the full MasteringAstronomy website which includes an electronic version of your textbook which can be used on a computer or in an app on your smart phone or tablet. It also includes access to the Study Area which includes video demonstrations, prep quizzes, simulations, app-based study modules and more.
3. **Digital access without the Electronic Text.** Purchase access to MasteringAstronomy without the eText. You will have access to the full MasteringAstronomy website and access to the Study Area which includes video demonstrations, prep quizzes, simulations, app-based study modules and more.
4. **Assignment-only access.** If you choose to access your MasteringAstronomy assignments without purchasing access You will not have access to the E-text or to the study centre. The instructions for this option will be posted on the ASTR209 D2L website.

Late Assignments will be awarded a zero grade. There will be a 24 hour period after the due date over which the maximum obtainable grade will decrease to zero. Extensions of the due date require justification in the form of a doctor's note or equivalent.

#### Assignments are due on the following dates:

Assignment 1: Sunday, January 19 at 23:59

Assignment 2: Sunday, February 2 at 23:59

Assignment 3: Sunday, February 16 at 23:59

Assignment 4: Sunday, March 1 at 23:59

Assignment 5: Sunday, March 15 at 23:59

Assignment 6: Sunday, March 29 at 23:59

Assignment 7: Sunday, April 12 at 23:59

### 4. Course Learning Incomes

There are no prerequisites for this course. Students are expected to have basic proficiency in math.

### 5. Syllabus

Observing the Cosmos. Structure of the Sun, and other stars. Properties of stars. Parallax, luminosity, Stephan-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. Cosmology. Galaxy evolution.

## 5. Final Exam

As per the scheduling by the Registrar's Office, the exam will begin at 8:30 AM on Thursday April the 23rd. The regularly scheduled exam is 2-hours in duration, but due to circumstances the exam duration will be 4-hours. The regularly scheduled end time of the exam is 10:30 AM on Thursday April 23rd. Due to circumstances however, students have up to 12:30 PM on Friday April 24th to complete their exam.

The exam will be administered through the Tophat interactive teaching tool, just as it has been used on assignments, and Part02 of your midterm exam. It is expected that students will complete the exam after four hours, but if unforeseen and critical communication problems are incurred, they have this additional grace period.

### 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 - Mar 23 2020 16:15

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### Department Approval

Electronically Approved - Mar 24 2020 11:43

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### Associate Dean's Approval for alternate final examination arrangements or remote learning