



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

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	93 %	85 %	80 %	75%	70%	65 %	60 %	55%	50%	42 %	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+.

Any missed component of course work receives a zero grade. Assignments are due at 23:59 on the due date (see later in this course outline). After this time, the maximum attainable grade decreases gradually to zero over a 24 hour period.

This course has a registrar scheduled final exam.

A 3% bonus grade can be earned for participating with TopHat in-class participation.

#### 4. Missed Components of Term Work:

The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself/themself with these regulations. See also [Section E.3](#) of the University Calendar.

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.

There are no scheduled out-of-class activities associated with this course.

#### 6. Course Materials:

Required Textbook(s):

Bennett, Donahue, Schneider, Voit, *The Cosmic Perspective: Stars, Galaxies, and Cosmology*: 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.

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 for a small bonus credit. 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 June 1, 2018.

## 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 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.

1. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **15 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 immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a re-assessment of the work if, and only if, the student has sufficient academic grounds. See sections [I.1](#) and [I.2](#) of the University Calendar
2. **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. **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.**

- c. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- d. **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.
- e. **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.
- f. **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.
- g. **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: [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca).
- h. **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.
- i. **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.
- j. **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).

## 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 ASTR209S2018. The join code is 717258.**

**You must have registered for the course in TopHat by Tuesday, May 22**

### **3. Homework assignments**

There will be five 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, May 27 at 23:59

Assignment 2: Sunday, June 3 at 23:59

Assignment 3: Sunday, June 10 at 23:59

Assignment 4: Sunday, June 17 at 23:59

Assignment 5: Sunday, June 24 at 23:59

### **4. Course Learning Incomes**

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

### **5. Course Learning 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.

### **6. 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.

**Department Approval:**

Electronically Approved

**Date:** 2018-05-04 14:15