

**AST 121 - Origins and Evolution of the Universe  
Syllabus for Winter 2020**

Instructor: Professor Hilding Neilson

Class: Wednesday 12:00 - 13:00

Friday 12:00 - 13:00

Friday 13:00 - 14:00

Classroom: MP 202

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Office hours: Tuesdays 2 - 5 pm (or by appointment)

**Course Description**

The origin of the Universe and all that it contains, from the chemical elements, stars and galaxies, and life. The course is intended for students who are enrolling in science and engineering courses.

**Pre-requisites** SPH4U Physics; MCB4U Calculus

**Exclusions** AST101H1, AST201H1, AST210H1. Also excluded are AST221H1, AST222H1 if taken previously or concurrently

My personal take on AST121: The purpose of this course is to share how exciting modern astronomy and astrophysics is and to help students understand the big questions astronomers are probing; how astronomy is done; and what tools do we use for that work. This course will contain a significant amount of mathematics and we will also do some data analysis (using software like excel) as well as qualitatively explore concepts. We will work on these techniques together and I intend to support you however possible to work on the skills we will use in this course and you may use throughout your academic career. To that end there will be work sessions most Fridays, I will have weekly office hours, and TA sessions will be organized throughout the semester (TBA). If you have any hesitation or questions please feel welcome to email me.

**Learning Outcomes that you should accomplish by taking this course:**

L1: Acquire basic astronomical knowledge: be able to describe, assess, and appreciate what the Universe consists of, some of the great astronomical current and past issues and what our position in the Universe is.

L2: Develop some of the skills that are important for astronomy, such as using math, data analysis, and qualitative discussion.

L3: Demonstrate critical thinking, the ability to extrapolate ideas, reasoning in developing ideas, and critical reflection. Develop critical assessment of reference sources. Learn to criticize constructively and perform peer review.

L4: Show clear and coherent communication skills, both orally and in writing.

L5: Demonstrate research skills.

**Required Materials:**

Textbook: Foundations of Modern Cosmology, 2nd edition, J. Hawley & K. Holcomb, Oxford University Press, [link](#) at UofT elibrary (both pdf download and on-line reading)

Additional and recommended reading:

Quarks, Leptons and the Big Bang, by Jonathan Allday (2002)

Just six numbers: the deep forces that shape the universe, by Martin Rees (2000)

I may also upload readings and post links in Quercus. Please check Quercus regularly.

*Other materials:* Please bring paper and pen/pencil. A basic calculator could be useful as well.

*iClicker.* We will **not** be using iClickers in the class, we will discuss various forms of assessment in class.

*Quercus:* Course materials (i.e., lecture slides) will be posted to Quercus. You will need to have access to Quercus, the online course management system:

<http://q.utoronto.ca>

*Lecture Slides:* I will post lecture slides before the lecture so you can follow along in class. Please note that lecture slides are not lecture notes, they are meant to illustrate discussion points and complement notes that you may take.

**Your Responsibilities** (besides Learning and completing assignments):

- Complete the readings before class. There might be pre-class assignments to assess you have read the material and there are readings from the text
- Monitoring the course on Quercus AND your [@mail.utoronto.ca](mailto:mail.utoronto.ca) e-mail address regularly. Announcements will be posted
- Please arrive on time.
- Please notify me in advance if you will miss class.
- Be courteous and respectful to the classroom community.
- While I encourage you to work in groups, and indeed some of the work will be performed that way (through in-class and out-of-class discussions), all of your written reports must be your own original work.
- Cell phones should be on mute and out of sight.

**Grades:** we follow the University of Toronto Faculty of Arts and Science grading policy.

<http://www.writing.utoronto.ca/advice/general/grading-policy>

A+ > 90	B+ 77 - 79	C+ 67 - 69	D+ 57 - 59	F < 49
A 85 - 89	B 73 - 76	C 63 - 66	D 53 - 56	
A- 80 - 84	B- 70 - 72	C- 60 - 62	D- 50 - 52	

**Marking Scheme:**

Activity	Points
Three Assignments	30
Midterm	25
Final Exam	40
Participation in Work Sessions	5

Assignments

There are three assignments in this course. Due dates are to be announced. Each assignment is worth 10%. Some options will require periodic time commitment, that is, the assignment cannot be done at the last minute. I urge students to check the assignments as soon as they are available. Furthermore, late assignments will be deducted 2 points (out of 10) per day late unless there is a medical reason or agreement with me before the due date.

Midterm

The midterm will be a two hour exam in class. Exact date to be announced. The midterm is worth 25% of the total grade. The exam will test material discussed in the previous lectures and writing assignments. Make-up exams will be available only if necessary, and with a valid medical certificate or with my agreement before the midterm date.

Final Exam

The final exam will be a three hour exam during the exam period. The exam will cover the **entire** content of the course with an emphasis on the latter half. Exam details will be announced by the University.

Participation in Work Sessions

There will be weekly work sessions on Fridays in the second hour of class. These work sessions will focus on developing skills that astronomers use, practice questions in astronomy related to the content, and work together reviewing material. There will be 10 sessions, and participation is required for at least 6 sessions.

No extra-point activities will be offered. The course is designed so you need to perform well in the designed activities for you to acquire the learning outcomes. However, I might allow you to improve your performance (and hence your grade) by working more on some particular aspects if you find honest difficulties the first time. This is not mandatory, neither for you, nor for me: you might not want to do it, I might not want to offer it. You are welcome to discuss options, but **only if you discuss them with me during office hours before the final lecture of the term.**

**Class Calendar:** If you require accommodation based on your religious holidays, please let me know so we can find an alternative that suits you.

Please note I will be posting a topic calendar to accompany the syllabus. It will be regularly updated.

**\*\*\*Deadlines are final\*\*\*** Written assignments are due at 11:59:00 pm on the given date. I will take points off for every day the written report is late (10% for each day late). Please contact me immediately if there are any conflicts.

**Writing Resources:** one of the major goals of this course is to help you develop academic writing skills.

**Writing Centres** — Every college on campus has a writing centre, which provides free one-on-one and group consultations. For more information please check:

[www.writing.utoronto.ca](http://www.writing.utoronto.ca)

If English is your second language please check:

<http://www.artsci.utoronto.ca/current/advising/ell>

**Plagiarism**, as described in the **Code of Behaviour on Academic Matters** (Appendix A, Item p), is ‘the wrongful appropriation and purloining, and publication as one’s own, of the ideas, or the expression of the ideas ... of another.’ This most common, and frequently most elusive of academic infractions is normally associated with student essays. Plagiarism is at once a perversion of originality and a denial of the interdependence and mutuality which are the heart of scholarship itself, and hence of the academic experience. Instructors should make clear what constitutes plagiarism within a particular discipline.’

How not to plagiarize: <http://www.writing.utoronto.ca/advice/using-sources/how-not-to-plagiarize>

We reserve the right to use [Turnitin.com](http://www.turnitin.com) to help detect plagiarism. “Normally, students will be required to submit their course essays to [Turnitin.com](http://www.turnitin.com) for a review of textual similarity and detection of possible plagiarism. The terms that apply to the University’s use of the [Turnitin.com](http://www.turnitin.com) service are described on the [Turnitin.com](http://www.turnitin.com) web site”.

**Academic Honesty:** “the University and its members have a responsibility to ensure that a climate which might encourage, or conditions which might enable, cheating, misrepresentation or unfairness not be tolerated. To this end, all must acknowledge that seeking credit or other advantages by fraud or misrepresentation, or seeking to disadvantage others by disruptive behaviour is unacceptable, as is any dishonesty or unfairness in dealing with the work or record of a student. (Code of Behaviour on Academic Matters, Section B)”.

<http://www.utoronto.ca/academicintegrity>

**Students with disabilities:** the University provides accommodations for students with disabilities in accordance with the terms of the Ontario Human Rights Code. This occurs through a collaborative process that acknowledges a collective obligation to develop an accessible learning environment that both meets the needs of students and preserves the essential academic requirements of the University’s courses and programs.

