ASTR 250 Introduction to Astrophysics

Department of Physics & Astronomy, UVIC Monday
& Thursday, 11:30 am – 12:50 pm
Fall Term 2025

Please read the entire document, which outlines the requirements and expectations of this course.

Instructor:	Prof. Kim Venn
Email:	kvenn@uvic.ca
Office:	Elliott #111
Office hours	Wednesday, 12:00 pm – 1:30 pm [or virtual on request: https://uvic.zoom.us/j/2475878039]
Lab TAs:	TBD
Grading TA:	TBD

Prerequisites

MATH101, PHYS110 or PHYS120, and ASTR150.

Course Description (*new!*)

This course will be focused on stars, stellar evolution, and nucleosynthesis. By studying the physical processes that operate in stars and stellar systems, we will learn how gravitational contraction is the key driver in stellar evolution, leading to unique equations in the stellar remnants. We will also develop tools for learning about the origins of the elements and how to use stars to learn about the Milky Way and the Universe. The course is intended for second-year physics, upper-division science, and engineering students, as it features quantitative analyses of data, derivations of key equations, and numerical examples and calculations.

Course Goals (*new!*)

Students who complete this course successfully will be able to:

- Apply the laws of physics to a wide range of astrophysical processes.
- Understand the basics of star formation, stellar evolution, and nucleosynthesis.
- Know the differences between different types of stars and stellar remnants.
- Calculate physical properties of stars and stellar systems with confidence.
- Discuss the origin of the elements, including the ingredients necessary for the emergence of life.

Required Text & Lab Manual (*new!*)

Required Textbook:	Stellar Evolution and Nucleosynthesis (2010, by Sean G. Ryan & Andrew J. Norton) *(Amazon or Cambridge University Press: paperback is $103.95 CAD)*
Lab Manual:	Astronomy 250 Laboratory Manual

Additional Texts

Other useful textbooks:
1. Foundations of Astrophysics (any edition), by Ryden & Peterson
2. Astronomy Today (recent editions), by Chaisson & McMillian

Course Grading

This course will be graded as follows:

	Total %
• Midterm test (Thursday, Oct 16th, 1 hour, in class)	20%
• Final Exam (Exam Week, TBD, 2 hours)	40%
• Lab exercises (you should be registered in a lab section)	20%
• Assignments (4-5 total, posted on Brightspaces)	20%

Please note that you cannot pass this course without a passing grade in the labs.

Course Structure (*new!*)

After an internal and external review of the Astronomy program last year (2024-2025), it was unanimously agreed that this course should be reformatted to focus on stellar astrophysics as needed for the upper division courses. The required textbook (above) is excellent for this, and thus we will be following it closely, covering approximately one chapter per week.

- I strongly recommend you purchase the paperback version and take notes directly in it.
- I strongly recommend that you read each Chapter before we discuss it in class.
- We will go sequentially through the Chapters, starting with Chapter 1 on Sept 8th.
- All supplementary materials will be posted to Brightspaces. This will include notes on the chemistry and dynamics of stars clusters, Local Group galaxies and stellar streams, Fast Radio Bursts, the Periodic Table and the First Stars.

Each class is 80 minutes and will be organized as follows:

- 5 min Start-up & Questions
- 30 min Lecture
- 10 min Break and/or small group exercise
- 30 min Lecture
- 5 minutes Final Questions

Course Policies and Academic Integrity

1. ATTENDANCE POLICY. All classes will be held synchronously, and you are expected to attend. If you have an unavoidable conflict at the time of a specific class or are ill, let the instructor (or TA in labs) know before the class. In extenuating circumstances, valid excuses will be accepted after class. As the course is organized through Brightspaces, it is possible to keep up with the course material and readings.
2. PENALTIES FOR LATE WORK and REQUESTS FOR EXTENSIONS. If a valid excuse is communicated to the instructor (or TA in labs) before the deadline, then late assignments will be accepted with no penalty. After the deadline, assignments will be accepted with a 20% deduction *per day*, and 100% deduction after 5 days.
3. POLICIES ON MISSED EXAMS, MAKE-UP EXAMS OR QUIZZES. If a valid excuse is communicated to the instructor (or TA in labs) before the deadline, then exams can be rescheduled to a mutually convenient time. Without prior communication or extenuating circumstances, then a missed exam will receive 0%.
4. POLICIES FOR WORKING TOGETHER ON ASSIGNMENTS & LABS. Students are encouraged to discuss assignments and labs together, which builds your scientific communication and collaborative skills. However, all assignments and labs should be completed and handed-in on your own.

5. REGRADING POLICY. You may submit a request to regrade an assignment, by providing the original assignment, identifying which question requires attention, and detailing your concerns. Submit your request within one week of the return of the assignment for consideration.

6. ETHICS/VIOLATIONS OF ACADEMIC INTEGRITY: Ethical behavior is an essential component of learning and scholarship. Students are expected to understand and adhere to UVic's academic integrity policy: https://www.uvic.ca/students/academics/academic-integrity/. If you have doubts about what constitutes a violation of the Academic Integrity policy, or any other issue related to academic integrity, please ask your instructor. Some examples of appropriate ethical scholarship include;
    - Citing your sources when presenting ideas and/or language that you have not developed yourself.
    - Not using online or unapproved resources for assignment answers (Chegg, Course Hero, etc.).
    - Not using your phone/watch to check course materials or talk with other students *during* tests.
    - Being civil, respectful, and supportive of an inclusive learning environment for all students.
    - ChatGPT, so long as you check it and cite it appropriately. (*new!*)

7. INCLUSIVE LEARNING ENVIRONMENT. The best learning environment is one in which all members feel respected while being productively challenged. To reach this goal, every participant has an active responsibility to foster a climate of intellectual stimulation, openness, and respect for diverse perspectives, questions, personal backgrounds, abilities, and experiences, and instructors bear the primary responsibility for its maintenance. A range of resources are available if you perceive an issue related to our learning environment: UVic encourages students to speak directly with the instructor (and/or lab Tas) about any concerns regarding a particular situation or instructional space - alternatively, students may bring concerns to another trusted advisor or administrator (such as an academic advisor, mentor, department chair, or dean).