

AST3018: Astronomy and Astrophysics 1

Spring 2026 | 3 credits

NOTE: This course complies with all UF academic policies. For information on those policies and for resources for students, please see UF's "[Academic Policies and Resources](#)" web page.

I. General Information

Meeting days and times: T (10:40 AM – 11:30 AM), R (10:40 AM – 12:35 PM)

Class location: FLI 0050

Instructor(s):

Name: Prof. Keri Hoadley

Office Building/Number: BRT 318

Phone:

Email: khoadley@ufl.edu

Office Hours: TBD

Teaching Assistant(s):

Name: Makayla Frisse

Office Building/Number:

Phone:

Email: m.frisse@ufl.edu

Office Hours: TBD

Course Description

First part of a two part sequence. Survey of astronomy and astrophysics for physical science, engineering, or mathematics majors. Covers gravitation, orbits and tides; the Moon

This sequence is intended for majors in a physical science or engineering who have completed the first semester (i.e. mechanics and optics) of a calculus based introductory physics course and are taking the second semester of a calculus-based physics course (i.e. electricity & magnetism and thermodynamics). AST3018 will cover: • Motions of the sky • A historical development of our understanding of the solar system • The generation of light and the interaction of light with matter • Telescopes and modern astronomical instrumentation • The properties and classification of stars • The physics of stellar interiors and atmospheres • The formation and evolution of stars

Prerequisites

Prereq: (PHY 2048 or PHY 2060) and (MAC 2311 or MAC 3472). Coreq: PHY 2049.

General Education Designation: none.

Course Materials

- Canvas (course assignments, announcements, documentation, etc.)
- Course Reserves/local bookstore (Foundations of Astrophysics by Barbara Ryden & Bradley Peterson)

Materials will be available through the following means:

Materials Fee: N/A

II. Course Goals

Course Objectives

In this course we will:

- We will emphasize the use of the scientific method and the application of mechanics and electromagnetism to understand the Universe and the bodies in it.
- We will develop the ability to discern scientific knowledge from non-scientific claims by using critical thinking.
- Students will conduct semi-guided astronomical observations using telescopes and CCD detectors at the UF Campus Teaching Observatory and gain experience working with astronomical data (through data reduction and analysis).

Student Learning Outcomes

A student who successfully completes this course will be able to:

- Identify, describe and explain concepts, theories, and terminology of astronomy and astrophysics and the scientific method, as well as major scientific developments in the field of astronomy, and the relevant processes that govern physical systems in astrophysics.
- Analyze quantitative data to formulate empirically-testable hypotheses derived from the study of physical processes in astronomy.
- Apply logical reasoning skills effectively through scientific criticism and argument in astronomy.
- Apply techniques of discovery and critical thinking effectively to solve problems and to evaluate outcomes. Student competency will be assessed through the observational project.
- Summarize and present scientific findings clearly and effectively using written and graphic forms.

III. Graded Work

Graded Components

Attendance & Participation (10%): This class contains both synchronous and asynchronous components. You will be responsible for studying all the material assigned and for participating in all in-class assignments.

Quizzes (10%): A major responsibility for this class will be to read the book chapters and watch the lecture videos every week before we cover the material in class. Quizzes will be assigned before class to help keep you on track with the material.

Homework (10%): There will be graded homework assignments throughout the course, due approximately every two weeks. The homework will include problems from the textbook and additional related problems.

Observing Project (35%): One of the most enjoyable aspects of science is doing research and making discoveries. In the class project "Observing the night sky", you will conduct astronomical observations using telescopes and CCD detectors at the UF Campus Teaching Observatory. You must sign up in advance for an observing session during the first two weeks of classes. The date of observing sessions can change depending on weather. At the Observatory, you will learn to: - Acquire astronomical objects using an eyepiece - Install CCD camera on the telescope and start up the computer interface - Focus the telescope - Obtain imaging and photometry of a celestial object. - Store images on computer and memory stick - Close down CCDs and telescopes After you obtain your observations, you will need to reduce and analyze your data. You will write a report that includes a log and description of your observations, data reduction, and analysis of the data (including answering questions posed in the instruction manuals). Your report will also include a summary of your results and their significance. Students will be collecting the data in groups, but all the reduction, analysis and report is individual. The project due date will depend on the date your observations are taken.

Exams (35%): There will be two exams, a midterm and a final, that will assess student learning outcomes. Both exams will be in person. The midterm exam will be during class time and held on the Thursday before Spring Break. The Final exam will be at the date and time assigned by the college during Finals week. These exams will test your content knowledge but will emphasize applying critical thinking skills and solving problems.

TOTAL: 100%

Grading Scale

Letter Grade	Number Grade
A	100-92.5
A-	92.4-89.5
B+	89.4-86.5
B	86.4-82.5
B-	82.4-79.5
C+	79.4-76.5
C	76.4-72.5
C-	72.4-69.5
D+	69.4-66.5
D	66.4-62.5
D-	62.4-59.5

Letter Grade	Number Grade
E	59.4-0

Note: A minimum grade of C is required to earn General Education credit.

IV. Calendar

Date	Topic	Readings/Preparation	Work Due
January 13, 2026	Celestial Sphere	Ch. 1	
January 20, 2026	Emergence of Modern Astronomy	Ch. 2	
January 27, 2026	Orbital Mechanics	Ch. 3	
February 3, 2026	The Earth-Moon System	Ch. 4	
February 10, 2026	Radiation & Matter	Ch. 5	
February 17, 2026	Spectroscopy	Ch. 5	
February 24, 2026	Detection of Light	Ch. 6	
March 3, 2026	The Sun	Ch. 7	
March 10, 2026	Stellar Properties	Ch. 13	Exam 1: Chs. 1 - 7
March 17, 2026	No Class (Spring Break)		
March 24, 2026	Stellar Properties (Con't)	Ch. 13	
March 31, 2026	Stellar Atmospheres	Ch. 14	
April 7, 2026	Stellar Interiors	Ch. 15	
April 14, 2026	Star Formation & Evolution	Ch. 17	
April 21, 2026	Interstellar Medium	Ch. 16	
April 28, 2026	Finals Week		Exam 2: Chs. 13 - 17

V. Procedure for Conflict Resolution

Any classroom issues, disagreements or grade disputes should be discussed first between the instructor and the student. If the problem cannot be resolved, please contact Prof. Desika Narayanan (desika.narayanan@ufl.edu, 352-294-1865). Be prepared to provide documentation of the problem, as well as all graded materials for the semester. Issues that cannot be resolved departmentally will be referred to the University Ombuds Office (<http://www.ombuds.ufl.edu>; 352-392-1308) or the Dean of Students Office (<http://www.dso.ufl.edu>; 352-392-1261).