Syllabus for AST 1002
Discovering the Universe
Section 11177, Fall 2025

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Office: 211 Bryant Space Science Center
Class Periods: MWF Period 5 (11:45-12:35)
Office Hours: M Period 6 (12:50-1:40),
W Period 7 (1:55-2:45)

Online Course Information: Handouts and additional information can be found on the course Canvas page. Homework assignments will be online through the Mastering Astronomy interface in Canvas.

Required Text: The Essential Cosmic Perspective 9th edition with Mastering Astronomy *(Bennett, Donahue, Schneider, & Voit)*

The electronic version of this textbook is available through UF All-Access. If you purchase this version, it comes with access to Mastering Astronomy. There will be instructions posted in Canvas.

Course Description:
This course provides a comprehensive look at modern astronomy, emphasizing the use of the scientific method and the application of physical laws to understand the universe including earth and its environment. Throughout this course, Students will develop the ability to discern scientific knowledge from non-scientific information by using critical thinking.

Course Learning Objectives

- To introduce students to the basic concepts of astronomy & astrophysics, providing an overview of modern astronomy.
- To teach students the scientific process and how we can understand the universe using basic physical laws derived on Earth.
- To teach scientific reasoning and improve scientific literacy. Scientific reasoning – the use of logic, observations, and critical thinking to interpret the world around you is a skill that will serve you well in your daily lives regardless of what career you pursue. Likewise, literacy in the basic concepts and terminology of science is necessary if you wish to follow a science stories in the news or make informed decisions (such as voting) on scientific issues.
- Communicate scientific ideas clearly and effectively using oral, written or graphic forms.

Student Learning Outcomes

- Students will define terms used to measure and describe the universe.
- Students will explain the processes involved in the formation and evolution of celestial bodies over astronomical time according to different models and

theories.

- Students will describe how scientific theories evolve in response to new observations and critically evaluate their impact on society.
- Students will formulate empirically testable hypotheses derived from the study of physical processes and phenomena.
- Students will apply logical reasoning skills through scientific criticism and argument to separate science from non-science.
- Students will gather and analyze astronomical data and communicate results in graphic and written forms.

General Education

AST 1002 meets the requirements for a General Education physical science (P) course. Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically-testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments. A minimum grade of "C" is required for general education credit.

General Education Student Learning Outcomes

- Students demonstrate competence in the terminology, concepts, methodologies and theories used within the discipline.
- Students communicate knowledge, ideas, and reasoning clearly and effectively in written and oral forms appropriate to the discipline.
- Students analyze information carefully and logically from multiple perspectives, using discipline specific methods, and develop reasoned solutions to problems.

General Education Subject Area Objectives

Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically-testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

Critical Dates

- September 22: 1st Exam
- October 15: 2nd Exam
- November 12: 3rd Exam
- December 3: Last Day of Class
- December 9: Final Exam (**10:00am-12:00pm**)

**For class projects the class will be divided into several groups with different due dates. All project deadlines will be before November 21. More information will follow.

Class Expectations

There will be weekly reading assignments from the textbook. You are expected to read the material in advance of the lectures and be ready to actively participate in class. I will not cover all of the assigned reading during class, but will rather focus upon the topics and concepts that are most important. If you wish for clarification on sections of the reading that you find confusing, you can send me email and I will try to adjust the lectures to cover that material.

You are also expected to not engage in any activity during class that is distracting to other students or detrimental to their ability to learn. Please be courteous to your fellow classmates and turn off the ringer on your phones. Use of phones is prohibited during lectures.

Course & Grading Information

Your grade for the course will be based on the following:

In class exams – (3 exams -15% each)	**45%**
Final Exam	**20%**
Class Projects	**15%**
Homework	**20%**

Grading scale: The following grading scale is guaranteed:

Letter Grade	% Points	GPA	Letter Grade	% Points	GPA	Letter Grade	% Points	GPA
A	>90	4.0	B-	77 - 79	2.67	D+	64 - 66	1.33
A-	87 - 89	3.67	C+	74 - 76	2.33	D	60 - 63	1.0
B+	84 - 86	3.33	C	70 - 73	2.0	D-	56 - 59	0.67
B	80 - 83	3.0	C-	67 - 69	1.67	E	< 55	0

- Your actual final grade will be no lower than on this scale, which may be curved based upon the overall performance of the class. Grading in this class is consistent with UF policies available at: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Assignment Values

Exams (65% of grade): The three mid-term exams will be given on September 22, October 13, and November 10. Each of these in-class exams will be worth 15% of your grade. The final exam, worth 20% of your grade, is scheduled for December 9 from 10:00am-12:00pm.

Homework (20%) : Homework will be online through the Mastering Astronomy interface on the Canvas page. The deadlines for each assignment will be clearly posted on this web page. In general assignments will be due each week on Mondays. Homework assignments must be submitted on time to receive full credit. For late assignments there will be a deduction of 33% per day. No homework extensions will be granted unless the extension is approved in advance of the deadline or documentation of a medical issue is provided.

Class Projects (15%): An important element of this course is the assigned hands-on class projects. Details will follow shortly.

Make-up Policy

Students are expected to complete all requirements by the specified due dates. If a student misses an assignment due to an excused absence as specified in the undergraduate catalog and provides the instructor with timely notification, they will be allowed a reasonable time to make up the missed work. The format of a make-up test/exam will be at the discretion of the instructor. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the Relevant UF Policy section below.

Extra Credit

There will be occasional extra credit problems on the homework. There will also be a few opportunities for additional extra credit during the course of the semester up to a maximum of 5% for the semester.

Relevant UF Policies

"This course complies with all UF academic policies. For information on those polices and for resources for students, please see this link." Note that the link includes university policy on excused and unexcused absences.

Preliminary Lecture Schedule (Subject to Change)

The lectures will follow the textbook fairly closely. The table below shows the approximate dates when each topic/chapter is scheduled to be covered.

Lecture Date	Lecture Content (Listed by corresponding chapter titles in textbook)	Weekly Reading Assignment
Week 1 (8/22)	*Part I: A Modern View of the Universe* – An introduction to basic concepts in astronomy such as distance scales.	Chapters 1
Week 2 (8/26)	*Part I: A Modern View of the Universe,* *Part I: Discovering the Universe for Yourself* – Learn about constellations, and how Sun-Moon-Earth configurations result in Moon phases and Solar and Lunar eclipses. Understand the reason for seasons. *Part I: The Science of Astronomy* – Learn about the roots of astronomy and how the scientific method has been used over hundreds of years to interpret the motions of planets and understand the nature of our Solar System.	Chapters 1,2,3
Week 3 (9/3)	*Part I: The Science of Astronomy*	Chapter 3
Week 4 (9/8)	*Part II: Making Sense of the Universe: Understanding Motion, Energy, and Gravity* – Learn about the laws of gravity and motion. *Part II: Light: The Cosmic Messenger* – Learn the nature of light and how astronomers observe various light wavelengths with telescopes to learn about astrophysical phenomena.	Chapters 4,5
Week 5 (9/15)	*Part II: Light: The Cosmic Messenger* *Part III: Formation of the Solar System, Earth and the Terrestrial Worlds* – Using the scientific method and observations discussed in this class, we discuss likely scenarios for the formation of our Solar System, and we will discuss the properties of the inner planets.	Chapters 5,6
Week 6 (9/22)	*Part III: Formation of the Solar System, Earth and the Terrestrial Worlds* **Exam**	Chapters 6,7
Week 7 (9/29)	*Part III: Jovian Systems, Asteroids, Comets, and Dwarf Planets* – We will learn about the properties of objects in the outer solar system, which reveal clues about the origin and evolution of our solar system. *Part III: Other Planetary System* – Learn how we find planets around other stars and the properties of these planetary systems.	Chapters 8,9,10

Week 8 (10/6)	*Part IV: Our Star* – Properties of the Sun and the mechanics of nuclear fusion are discussed. *Part IV: Surveying the Stars* – Learn the properties of stars and how they are measured, including some distance determination techniques. Discover how color-magnitude diagrams are used to determine ages and binary star systems to estimate stellar masses.	Chapters 11, 12
Week 9 (10/13)	*Part IV: Star Stuff* – Discover how the stars form out of the interstellar medium. Follow the timeline for typical stars from infancy to death **Exam**	Chapter 13
Week 10 (10/20)	*Part IV: Star Stuff* *Part IV: The Bizarre Stellar Graveyard* – Learn about the dense remnants of stars and discuss the unusual gravitational effects observed near Black Holes.	Chapters 13,14
Week 11 (10/27)	*Part IV: The Bizarre Stellar Graveyard* *Part V: Our Galaxy* – Learn the properties of our Milky Way galaxy and how the scientific method has been used to learn the nature of this large system of stars, gas and dust.	Chapters 14,15
Week 12 (11/3)	*Part V: A Universe of Galaxies* – Discover the different types of galaxies in the Universe and how they compare to the Milky Way. Learn about galaxy interactions and mergers, galaxy evolution and supermassive black holes.	Chapter 16
Week 13 (11/10)	*Part V: The Birth of the Universe* – Learn how we observe the effects of the Big Bang around us today including the cosmic microwave background, universal expansion and acceleration, the curvature of space and the formation of structure. **Exam**	Chapters 17,18
Week 14 (11/17)	*Part V: Dark Matter, Dark Energy, and the Fate of the Universe* – Discover the importance of dark matter and how it has been identified in galaxies and larger scale structures. *Part VI: Life in the Universe* – Learn about the history and properties of life on Earth, life in the solar system, and search for life elsewhere.	Chapters 18,19
Week 15 (12/1)	*Part VI: Life in the Universe,* Exam Review	Chapter, 19
Exam Week	**Final Exam**	Cumulative – all chapters