AST1002: Discover the Universe (Online)

3 CREDIT HOURS, FALL 2025, SECTIONS 007F, 1A20, 1A40, 1F98

INSTRUCTOR: Naibi Mariñas

Office number: *211A Bryant Space Science Center*

E-mail address: *Use Canvas Inbox. For DRC documentation use marinas@ufl.edu*

COURSE TA: To be announced

TAs e-mail address: *Use Canvas Inbox.*

COURSE WEBSITE: https://ufl.instructure.com/courses/532626

OFFICE HOURS: The instructors and TAs will use Zoom Conferences to conduct office hours. Time to be announced at the beginning of term.

COURSE COMMUNICATIONS: For any class-related logistic or content questions, students should use the **Course Questions Forum**. This will benefit all students that might have similar questions and avoid repetitive questions. We will regularly answer all questions posted in the board. **If a student has a private question, the student should contact the teaching assistants or instructor using the Inbox in Canvas.**

Students can expect a reply within 24 hours during weekdays for questions posted in the Course Questions discussion board. If a post is made on Friday afternoon or during the weekend, it will not be answered until we check the discussion on the following Monday.

This is a large enrollment online course. Questions sent by email can take longer depending on the number of questions we receive. During the last two weeks of classes, it will take longer to get a reply from us while we work on completing all grading. Attending office hours will be the fastest way to get in touch with us during that time.

Announcements in the class website will be used to communicate with the whole class. Students should frequently check the Announcement page. The class settings in Canvas can be adjusted so that announcements are sent directly to emails. I recommend each student to check their settings to make sure that option is marked.

REQUIRED MATERIALS: This class is enrolled in **UF All Access** to facilitate access to all course materials from the first week of class. The cost of the class materials is a lot less using the UF All Access choice than buying the materials outside UF All Access. **If students opt out of UF All Access, they are still responsible for having all course materials the first week of class.** Not receiving the course materials during the first week of classes will not be considered as a valid excused for missing assignments early in the semester.

The required textbook for the class is ***The Essential Cosmic Perspective*** by Bennett, Donahue, Schneider, and Voit, ***9th Edition*** and Mastering Astronomy Access code, Publisher: Pearson/Addison-Wesley, San Francisco. *(Make sure the book has the word **Essential** in the title; there is a more advanced copy of the book with a very similar title by the same author!)*

MATERIAL AND SUPPLY FEES: There is no additional material and supply fees for this course.

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 claims by using critical thinking. (P)

The topics we will cover include:

- Observing the sky
- Tools of Astronomy
- Our solar system
- Other solar systems
- The nature and lives of stars
- Our Milky Way Galaxy
- Other galaxies
- The origin and fate of the Universe
- The search for extraterrestrial life

For a complete list of topics and assignments, see the detailed schedule at the end of the syllabus.

GENERAL EDUCATION: AST 1002, Discover the Universe, is a Florida State Core 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.

PREREQUISITE KNOWLEDGE AND SKILLS: Although this is essentially a non-mathematical science course, a very basic knowledge of mathematics is required. Middle School arithmetic and pre-algebra is sufficient.

COURSE AND GEN ED STUDENT LEARNING OBJECTIVES AND OUTCOMES:

1. To provide students with a broad overview of modern astronomy. Students will be able to:
    - define terms used to measure and describe the universe
    - explain the processes involved in the formation and evolution of celestial objects over astronomical time according to different models and theories
2. To review the major scientific developments in astronomy and summarize their impacts on society and our environment. Students will be able to:
    - describe how scientific theories evolve in response to new observations and critically evaluate their impact on society
3. To teach the scientific method, improve scientific literacy, and help students learn to communicate scientific ideas clearly and effectively using written or graphic forms. Students will be able to:
    - formulate empirically-testable hypotheses derived from the study of physical processes and phenomena
    - gather and analyze astronomical data and communicate results in graphic and written forms
4. To develop the ability to distinguish science from non-science
    - apply logical reasoning skills through scientific criticism and argument to separate science from non-science

COURSE POLICIES:

This is a one term online asynchronous course. Each week students will be required to complete a set of assignments. All assignments are listed in the course schedule by week; specific due dates can be found in the Course Calendar. As this is an online course, students must plan to have regular Internet access and time to explore the resources available on the various ideas and topics that we will be covering.

REQUIREMENTS: Students are expected to:

- Complete all Modules in a timely fashion. Each module includes an introductory video by a faculty member of the astronomy department, assignments, tutorials, and additional videos that help students understand the material better. Assignments will begin on the first week of classes. If you do not login to the class website and work on the content weekly, the assignments will be late.
- Complete three short projects spaced out during the term. Some projects require multiple days of work, so make sure to read over the assignment early.
- Check the **course announcements** and class e-mail at least three times a week.

COURSE TECHNOLOGY: Access to and on-going use of a computer is required for all students. Competency in the basic use of a computer is required. Course work will require use of a computer and a broadband connection to the Internet. In addition, students are required to have speakers and a webcam to take the proctored exams using Honorlock. For additional information on UF College of Liberal Arts and Sciences policy regarding computer requirements you can visit: http://it.clas.ufl.edu/policies/student-computer-requirement/

COURSE EVALUATION BY STUDENTS: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways: [1] The email they receive from GatorEvals; [2] Their Canvas course menu under GatorEvals; or [3] The central portal at https://my-ufl.bluera.com. Guidance on how to provide constructive feedback is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

GRADING POLICIES:

Grades for the course will be based on the following:

Assignment	Points or percentage
PlayPosit Quizzes	10 %
Reading Quizzes (MyLab)	10 %

Simulations	10 %
Discussions (5 Total)	20 %
Projects (3 projects)	15 %
Exams (4 exams)	35 %

GRADING SCALE:

Grade	% Points	GPA	Grade	% Points	GPA	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-	57 – 59	0.67
B	80 – 83	3.0	C-	67 – 69	1.67	E	< 56	0

See UF Grades and Grading Policies for more information.

VIDEO QUIZZES, MYLAB ASSIGNMENTS AND SIMULATIONS (30 %): A major responsibility for this class will be to watch the introductory videos, complete the reading assignments, and work on the activities assigned in each module.

All introduction videos use PlayPosit quizzes to let you interact with the recorded material and test your understanding of the content. You will be able to rewatch the videos, but there is only one attempt for the PlayPosit quizzes.

Reading quizzes to help you keep up with the reading and gauge your reading comprehension will be on MyLab and Mastering under Pearson Access. You will need to access Pearson through our Canvas website.

In some modules, you will also have simulations to help you visualized and understand complex topics.

DISCUSSIONS (20 %): Online discussion based on articles and videos will be used to further explore the topics we study. We'll go beyond what the text has to say and look at new perspectives on the stopics and how they relate to other disciplines or areas of our lives. All discussions use Perussall. There are five discussions spread out throughout the term. Your grade on the discussions is based on interaction with the content and the quality of your comments in response to the discussion prompt and the entries from

other students. There are multiple ways to achieve the maximum score. These include reading the article or watching the video to the end, making at least 4 high quality comments, and interacting with the material multiple times (for example, first to answer the questions on the prompt and a second time to read through your classmates comments and reply to them). Keep in mind that all your comments need to be original, created by you without the help of AI. You will be able to track your grade while you work on the discussions and can improve that grade with multiple entries before the due date. Posts added after the due date will not count towards your grade.

PROJECTS (15 %): One of the most enjoyable aspects of science is doing research and making discoveries. You will be completing two short projects during the class. You should read the assignment early on the module that they are assigned and estimate the time needed to complete the assignment. Projects can take more than one week to complete. Project 1 will ask you to use physical laws to derive properties for a planet. Project 2 will ask you to take observations of the Sun during a 10-day period to derive properties of the Sun (no archival data can be used, only current observations of the Sun are allowed). If you are having problems while working on the projects during the first week, contact the instructor or class TA for help.

EXAMS (35 %): Four exams will be assigned during the semester, three regular exams and a cumulative final.

All exams will be proctored using Honorlock. Read the Honorlock section on the Orientation page in the class website for more information.

The lowest exam grade will be dropped.

LATE ASSIGMENT POLICY: With the exception of discussions, students that miss assignments without a valid excuse may submit assignments after the stated deadlines. A 10% grade penalty is assessed for work up to twenty-four hours late; an additional 10% is assessed for each additional day the work is late. Due to the interactive nature of discussions, discussions are open for one week and you can work on them throughout that week, all work on discussions submitted past the due date will receive no credit.

ATTENDANCE AND MAKE UP POLICY: Requirements for make-up exams, assignments, and other work in the course are consistent with university policies. Since this is an asynchronous online course, students are expected to work weekly on the class website. *See UF Academic Regulations and Policies for more information regarding the University Attendance Policies.*

Late submissions without penalty or make up assignments will only be accepted with a valid excuse. If students will be missing an extended period of time (a week or longer), students need to contact the Deans of Students Office Care Area. Students will be permitted a reasonable amount of time to make up the material or activities covered during excused absences.

UF POLICIES:

UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES: Students requesting accommodation for disabilities must first register with the Dean of Students Office (http://www.dso.ufl.edu/drc/). See the *"Get Started With the DRC" webpage on the Disability Resource Center site.* You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive; therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT: UF students are bound by The Honor Pledge which states "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. See the UF Conduct Code website for more information. This includes the use of AI: except where explicitly instructed, no student is allowed to use any AI tools (e.g., including Grammarly) to assist with any assignments in this course. Doing so will be considered a violation of the student honor code. If you have any questions or concerns, please consult with the instructor or TAs in this class.

NETIQUETTE: COMMUNICATION COURTESY: All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. See Netiquette Guide for Online Courses for more information.

UF ONLINE HANDBOOK: Additional information can be found on http://handbook.ufonline.ufl.edu/

PRIVACY AND ACCESSIBILITY POLICY:

INFRASTRUCTURE (CANVAS)

- Privacy Policy.
- Accessibility.

ZOOM

- Privacy Policy.
- Accessibility.

YOUTUBE (GOOGLE)

- Privacy Policy.
- Accessibility (scroll all the way down for YouTube accessibility information).

HONORLOCK

- Privacy Policy.
- Accessibility

GETTING HELP:

- Health and Wellness

  U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

  Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

  Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

  University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

  UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

  GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273- 4450.

- Academic Resources

  E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

  Career Connections Center: Reitz Union Suite 1300, 352-392- 1601. Career assistance and counseling services.

  Library Support: Various ways to receive assistance with respect to using the libraries or finding resources. Call 866-281-6309 or email ask@ufl.libanswers.com for more information.

  Writing Studio: Daytime (9:30am-3:30pm): 2215 Turlington Hall, 352-846-1138 | Evening (5:00pm-7:00pm): 1545 W University Avenue (Library West, Rm. 339). Help brainstorming, formatting, and writing papers.

  Academic Complaints: Office of the Ombuds; Visit the Complaint Portal webpage for more information.

  Enrollment Management Complaints (Registrar, Financial Aid, Admissions): View the Student Complaint Procedure webpage for more information.

Annotated Weekly Schedule

WEEK/ DATE	ACTIVITY	TOPIC/ASSIGNMENT (QUESTION/SUBJECT)
Week 1-2 8/21 8/25	Topic	Module 1. Our Place in the Universe
	Summary	Cosmic address. Distance, size and time scales. Celestial sphere. Motions of the stars, planets, the Sun and the Moon. Seasons. Moon. Lunar Phases and eclipses.
	Readings	Chapters 1 and 2
	Assignments	Introduce yourself on the class website Watch Module 1 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering Complete Lunar Phases and Seasons Simulation assignment Complete Discussion 1 on Perusall
Week 3 09/01	Topic	Module 2. The Science of Astronomy

WEEK/ DATE	ACTIVITY	TOPIC/ASSIGNMENT (QUESTION/SUBJECT)
	Summary	Brief overview of evolution of scientific theories leading to modern astronomy. Science vs pseudoscience. Kepler's Laws of motion. Newton's laws of motion and universal gravitation.
	Readings	Chapters 3 and 4
	Assignments	Watch Module 2 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering Complete Planetary Orbits Simulation assignment Start working on Project 1: How massive is this new planet? Calculate properties of Eris given observed orbital parameters on its moon. Defining planets and dwarf planets
Week 4 09/08	Topic	Module 3. Tools of Astronomy: Light and Telescopes
	Summary	Overview of electromagnetic spectrum and how we use light to derive properties of celestial objects. Telescopes and their properties.
	Readings	Chapter 5
	Assignments	Watch Module 3 Video Take PlayPosit Video Quiz

WEEK/ DATE	ACTIVITY	TOPIC/ASSIGNMENT (QUESTION/SUBJECT)
		Submit reading quiz and tutorials on MyLab and Mastering Complete Blackbody Simulation assignment Continue to work on Project 1
Week 5 09/15	Topic	Module 4. Overview of the Solar System, Earth and Terrestrial Planets
	Summary	Structure of solar system. Nebular theory of SS formation. Formation of Earth and the Moon. Processes that shape planets over time. Atmospheres. Properties of Earth, the Moon, Venus and Mars.
	Readings	Chapters 6 and 7
	Assignment	Watch Module 4 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering Complete Discussion 2 on Perusall
Week 6 09/22	Topic	Module 5. Jovian and Small Worlds
	Summary	Compare Jovian planets and terrestrial planets. Atmospheres. Origin of rings and moons. Galilean moons and Titan. Compare processes shaping

WEEK/ DATE	ACTIVITY	TOPIC/ASSIGNMENT (QUESTION/SUBJECT)
		surface and atmosphere of Titan to those shaping Earth. Asteroids and Comets. Impacts.
	Readings	Chapters 8 and 9
	Assignment	Watch Module 5 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering
Week 7 09/29	Topic	Module 6. Other Planetary Systems
	Summary	Challenges of detecting exoplanets. Direct and Indirect methods of detection. Properties of exoplanets. Compare other planetary systems to our own.
	Readings	Chapters 10
	Assignment	Watch Module 6 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering Complete Transit Method Simulation assignment Complete Discussion 3 on Perusall

WEEK/ DATE	ACTIVITY	TOPIC/ASSIGNMENT (QUESTION/SUBJECT)
Week 8 10/06	Topic	Module 7. The Sun and Other Stars
	Summary	Our Sun. Stellar structure and activity. Source of Energy. Other stars. Stellar properties and classification of stars. HR diagram.
	Readings	Chapters 11 and 12
	Assignment	Watch Module 7 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering Begin working on Project 2: Observing the Sun Take Exam 1
Week 9 10/13	Topic	Module 8. Formation and Evolution of Stars
	Summary	Interstellar medium. Stellar clusters. HR diagram. Star formation and evolution for low and high mass stars. Planetary nebulae and supernovae.
	Readings	Chapter 13
	Assignment	Watch Module 8 Video Take PlayPosit Video Quiz

WEEK/ DATE	ACTIVITY	TOPIC/ASSIGNMENT (QUESTION/SUBJECT)
		Submit reading quiz and tutorials on MyLab and Mastering Continue working on Project 2: Observing the Sun
Week 10 10/20	Topic	Module 9. Death of Stars
	Summary	End products of stellar evolution. White dwarfs, neutron stars, pulsars, black holes
	Readings	Chapter 14
	Assignment	Watch Module 9 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering Complete Discussion 4 on Perusall
Week 11 10/27	Topic	Module 10. Our Galaxy
	Summary	Properties and structure of our galaxy. Motion of stars in different regions. Nature of spiral arms. Rotation curve, mass and dark matter.
	Readings	Chapter 15
	Assignment	Watch Module 10 Video

WEEK/ DATE	ACTIVITY	TOPIC/ASSIGNMENT (QUESTION/SUBJECT)
		Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering Take Exam 2
Week 12 11/03	Topic	Module 11 – A Zoo of Galaxies
	Summary	Properties and evolution of different types of galaxies. AGN and quasars. Hubble Law and Expansion of the universe.
	Readings	Chapter 16
	Assignment	Watch Module 11 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering
Week 13 11/10	Topic	Module 12. The Beginning of Time
	Summary	Cosmological principle. Big Bang theory and observational evidence. Cosmic microwave background. Inflation.
	Readings	Chapter 17

WEEK/ DATE	ACTIVITY	TOPIC/ASSIGNMENT (QUESTION/SUBJECT)
	Assignment	Watch Module 12 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering
Week 14 11/17	Topic	Module 13. Dark Forces and the Fate of the Universe
	Summary	Galaxy distribution. Expansion of the Universe. Dark matter and dark energy. Observational evidence. Density, geometry and fate of the Universe.
	Readings	Chapter 18
	Assignment	Watch Module 13 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering Complete Discussion 5 on Perusall
11/24		Thanksgiving Break
Week 15 12/01	Topic	Module 14. Life in the Universe

WEEK/ DATE	ACTIVITY	TOPIC/ASSIGNMENT (QUESTION/SUBJECT)
	Summary	Origin, needs and properties of Earth Life. Places where we can find life in our solar system and around other stars. SETI program. Drake equation.
	Readings	Chapter 19
	Assignment	Watch Module 14 Video Take PlayPosit Video Quiz Submit reading quiz and tutorials on MyLab and Mastering Take Exam 3
Finals Week 12/06	Assignment	Take Final Exam