

# DISCOVER THE UNIVERSE

AST1002, 3 CREDIT HOURS, SPRING 2023

**INSTRUCTORS:** Naibi Mariñas

Office number: (online)

E-mail address: *Use Inbox in Canvas*

**COURSE TA'S:** To be announced

**COURSE WEBSITE:** <https://ufl.instructure.com/>

**OFFICE HOURS:** The instructors and TAs will use Zoom Conferences to conduct office hours. The Office Hours are listed in the class. Zoom conferences can also be scheduled by appointment.

**COURSE COMMUNICATIONS:** For any class-related logistic or content questions, students should use the **Course Questions** discussion board. 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 instead.**

Students can expect a reply from within 24 hours during weekdays in the Course Questions discussion board, unless the question is posted during the two final weeks of classes. 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. Since many assignments in this class are due on Sundays, I recommend working on them early and asking any questions before noon on Fridays. We will not be working on the class on weekends.

**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 excuse for missing assignments early in the semester.

The required textbook for the class is **The Essential Cosmic Perspective** by Bennett, Donahue, Schneider, and Voit, **Eighth 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!

**COURSE DESCRIPTION:** This course offers a broad overview of modern astronomy. We will examine how observation, experimentation and exploration have led to our present day understanding of the Earth environment and the Universe we live in. Our goal is to help students gain a physical understanding and an appreciation of the cosmos, and more generally, of the scientific method and how scientific discoveries impact society. Along the way, we will use and practice critical thinking skills and learn how to formulate empirically testable hypotheses. (P)

The topics we will cover include:

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

**GENERAL EDUCATION:** AST 1002, Discover the Universe, 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.

**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:**

- To provide students with a broad overview of modern astronomy. Students will be able to define common astronomical terms and explain basic concepts and theories for a range of astrophysical phenomena. Student learning will be assessed through quizzes, and exams.
- To review the major scientific developments in astronomy and summarize their impacts on society and our environment such as recognizing our place in the Universe, comparing energy sources, and how changes in planetary atmospheres influence climate change. Students will be able to explain astronomical discoveries and critically evaluate their impact on society. They will be able to evaluate good and bad science. Student assessment will be based on discussions of news topics in astronomy.
- To teach scientific reasoning. Scientific reasoning is the use of logic, observations, and critical thinking to interpret the world around you. Students will formulate empirically-testable hypotheses derived from the study of physical processes and phenomena and apply logical reasoning skills through scientific criticism and argument. These skills will serve them in their daily lives regardless of what career they pursue. This will be accomplished with two online projects.
- To improve scientific literacy and help students learn to communicate scientific ideas clearly using written or graphic forms. Literacy in the basic concepts and terminology of science is necessary if they wish to follow science stories in the news or make informed decisions (such as voting) on issues that pertain to science. Students will be able to explain basic concepts in astronomy and interpret astronomical data. This will be accomplished through discussions and as part of the projects.

**COURSE POLICIES:**

This is a one term online 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, reading 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.**

- Actively participate in all discussions.
- Complete two 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 via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## GRADING POLICIES:

See <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx> for general UF grading policies. Grades for the course will be based on the following:

| Assignment                           | Points or percentage |
|--------------------------------------|----------------------|
| Weekly Quizzes and MyLab Assignments | 15 %                 |
| Discussions (6 Total)                | 20 %                 |
| Projects (2 projects)                | 20 %                 |

|                 |      |
|-----------------|------|
| Exams (4 exams) | 45 % |
|-----------------|------|

### 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    |

**VIDEO QUIZZES AND MYLAB ASSIGNMENTS (15 %):** 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. This will help you learn the material.

**Introductory video quizzes:** There will be a weekly quiz for each short introductory video in the class. There will be multiple attempts to take the quiz, but the **grade recorded for the assignment will be the average of the grades for all attempts.** Students should take careful notes when watching the videos and watch them multiple times if needed, before taking the quiz. All the information needed is included in the short videos. Looking for the information in the internet will give the wrong answers.

**MyLab and Mastering Assignments:** Homework and tutorials based on your reading will also be assigned each week to help students keep up with the reading and gauge the reading comprehension **Students need to use the textbook to answer the quizzes.** These assignments are available through the MyLab and Mastering link in the class website.

The schedule for the quizzes can be found on the class website.

**DISCUSSIONS (20 %):** Online discussion will be used for further exploration of the topics we study. We'll go beyond what the text has to say, and collaborate to brainstorm new perspectives on the subject and how it relates to other disciplines or areas of our lives. As such, students will be assessed by their participation in the Discussion Forum. [L]  
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For each week/module that contains a Discussion Forum, students will be expected to post a thoughtful, **detailed response** (i.e., "yes," "no," "I agree," or "I disagree" answers are not sufficient) by the date posted on the course Calendar (usually midweek). The response should give **the student's opinion on the topic**.

All discussion posts will have to be submitted as pdf files to Turnitin. These Turnitin assignments are due a few days before the discussion. This tool will help ensure that the posts are original. If a post is not original, Turnitin will give it a yellow, orange or red label and the students will have the opportunity to check their report, fix the post and resubmit. Occasionally, Turnitin will highlight references as non-original and this might give a yellow label. Do not include the references on the Turnitin submission to avoid this problem. **Posts that receive a red, orange, or yellow label will not be read and will receive an automatic grade of 0.** Students that receive a flag with these colors, are responsible for editing their posts and resubmitting to Turnitin before posting on the discussion forum.

**There will be 6 discussions during the term and the lowest grade on a discussion will be dropped to accommodate any personal or technical problem. Discussions will receive a grade of 0 after two days late.**

**PROJECTS (20 %):** One of the most enjoyable aspects of science is doing research and making discoveries. Students are expected to complete **two short projects**.

Students will have at least **two weeks** to complete each project. Students should read the assignment early on so they can estimate the time needed for the assignment. If a student is having problems while working on the projects **during the first week of the assignment**, the instructor should be contacted for help.

**Penalties for late submission will be 10% per day the project is late. After 10 days, the project will receive zero.**

**EXAMS (45 %):** Four exams will be assigned during the semester, three during the regular semester and a cumulative final during Finals week. The lowest exam grade will be dropped at the end of the term, so only 3 exams will be included in the class grade.

The first exam will be timed, but it will not be proctored. **The second and third exams will be proctored using Honorlock. The cumulative final will also be proctored with Honorlock.** Read the Honorlock section on the Start Here page in the class website for more information.

**LATE ASSIGNMENT POLICY:** Students may submit projects and MyLab 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.

All discussions need to be submitted on time. Any discussion more than 2 days late will receive a grade of 0.

**MAKE UP POLICY: EXAMS:** One exam grade is dropped to accommodate any issues students may have while taking the exams. **If a student misses one exam for any reason, there will be no make-up**, and the drop will be applied to that exam. If a student misses two exams, he/she will need to provide written documentation excusing the student from academic activity during all the days when each exam was available for scheduling. The documentation needs to be provided as soon as possible. If the student was excused for missing both exams, one of the exams will be dropped, and the student will be allowed to do a make-up exam for the second exam.

**Quizzes:** To account for any circumstances (including excused documented issues) that might hinder the performance on a quiz (including MyLab assignments), the four lowest quiz grades will be dropped at the end of the semester. This is the equivalent of one week of assignments. Unless you need to miss more than one week of classes due to excused circumstances, there will be no make-up quizzes or any other accommodations to replace a quiz. If the student has more than four excused assignments missing, the student should provide documentation for every missing assignment to be allowed to do make-up work.

**Projects:** To be able to make up a project, a student must provide written documentation showing that the student could not work on the project during the whole time the assignment was available.

**Discussions:** Given the interactive nature of discussions, there is no make-up work for discussions, but one discussion grade will be dropped at the end of the term.

## 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/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. 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:** Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>

This is an excerpt from the Academic Honesty Guidelines and Student Conduct Code in the University of Florida Undergraduate Catalog:

“Academic Honesty: The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge are diminished by cheating, plagiarism, and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff, and administrators who practice dishonest or demeaning behavior.”

Cheating is not tolerated in this class. Everyone in this class is expected to follow the University of Florida Honor Code: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. Any student suspected of academic misconduct will be automatically referred to the Honor Code Chancellor as required by UF.

On all work submitted for credit by students at the university, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

**NETIQUETTE: COMMUNICATION COURTESY:** All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. <http://sfrc.ufl.edu/courses/distance/NetiquetteGuideforOnlineCourses.pdf>

**UF ONLINE HANDBOOK:** Additional information can be found on <http://handbook.uflonline.ufl.edu/>



## PRIVACY AND ACCESSIBILITY POLICY:

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

## INFRASTRUCTURE (CANVAS)

- [Privacy Policy](#) Links to an external site.
- [Accessibility](#) Links to an external site.

## ZOOM

- [Privacy Policy](#) (Links to an external site.)
- [Accessibility](#) (Links to an external site.)

## YOUTUBE (GOOGLE)

- [Privacy Policy](#) (Links to an external site.)
- <https://about.google/belonging/disability-inclusion/product-accessibility/> (scroll all the way down for YouTube accessibility information)

## HONORLOCK

- [Privacy Policy](#) (Links to an external site.)
- [Accessibility](#)

## GETTING HELP:

For issues with technical difficulties for E-learning, **do NOT contact the instructor**, please contact the UF Help Desk at:

- [Learning-support@ufl.edu](mailto:Learning-support@ufl.edu)
- (352) 392-HELP - select option 2
- <https://elearning.ufl.edu/keep-learning/>

**Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them.** The ticket number will document the time and date of the problem. Students MUST contact the instructor within 24 hours of the technical difficulty to request a make-up.

Other resources are available at <http://www.distance.ufl.edu/getting-help> for:

- Counseling and Wellness resources
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support

Should students have any complaints with their experience in this course they should visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

## ANNOTATED TENTATIVE WEEKLY SCHEDULE:

| WEEK/<br>DATE | ACTIVITY       | TOPIC/ASSIGNMENT<br>(QUESTION/SUBJECT)  |
|---------------|----------------|---|
| Week 1        | Topic          | Chapter 1 and 2. Naked Eye Astronomy  |
|               | Summary        | Cosmic address. Sizes and distances. Galactic recycling. Celestial sphere. Earth motion. Stellar, planetary, and lunar motion. Seasons. Lunar phases and eclipses.                |
|               | Readings/Works | Syllabus<br>Textbook Chapters 1 and 2   |
|               | Assignment     | Syllabus Quiz<br>Module 1 Discussion<br>Module 1 Video Quiz<br>MyLab Chapter 1 and 2 Quizzes  |
| Week 2        | Topic          | Chapters 3 and 4. The Science of Astronomy  |
|               | Summary        | Pseudoscience vs science. Geocentric and heliocentric models. Stellar parallax. Kepler's laws of motion. Galileo observations. Newton's laws of motion and universal gravitation. |
|               | Readings/Works | Textbook Chapters 3 and 4   |
|               | Assignment     | Module 2 Discussion   |

| WEEK/<br>DATE | ACTIVITY       | TOPIC/ASSIGNMENT<br>(QUESTION/SUBJECT)   |
|---------------|----------------|--|
|               |                | Module 2 Video Quiz<br>MyLab Chapter 3 and 3 Quizzes and Tutorials<br>Project 1: How massive is this new planet?         |
| Week 3        | Topic          | Chapter 5. Light and Telescopes  |
|               | Summary        | Properties of light. Electromagnetic spectrum. Kirchhoff's Laws. Blackbody. Doppler effect. Types of telescopes.         |
|               | Readings/Works | Textbook Chapter 5   |
|               | Assignment     | Module 3 video quiz<br>MyLab Chapter 5 quiz and tutorial<br>Continue working on Project 1                                |
| Week 4        | Topic          | Chapters 6 and 7 – Overview of Solar System, Earth and its Moon  |
|               | Summary        | Structure of solar system. Solar system formation. Structure of Earth. Evolution of Earth. Formation of the moon. Tides. |
|               | Readings/Works | Textbook Chapters 6 and 7  |
|               | Assignment     | Module 4 Video Quiz<br>Module 4 Discussion<br>MyLab Chapters 6 and 7 quizzes and tutorials<br>Submit Project 1           |

| WEEK/<br>DATE | ACTIVITY       | TOPIC/ASSIGNMENT<br>(QUESTION/SUBJECT)  |
|---------------|----------------|---|
| Week 5        | Topic          | Chapters 7 and 8. Terrestrial and Jovian Planets  |
|               | Summary        | Processes shaping terrestrial planets. Atmospheres. Compare Jovian planets. Rings. Magnetic fields.   |
|               | Readings/Works | Textbook Chapters 7 and 8   |
|               | Assignment     | Module 5 Video Quiz<br>MyLab Chapters 7 and 8 quizzes and tutorials   |
| Week 6        | Topic          | Chapter 9 – Small Worlds  |
|               | Summary        | Galilean moons properties. Titan and its atmosphere. Orbital and physical properties of asteroids. Orbital and physical properties of comets. Near Earth Objects (NEO) and impacts. |
|               | Readings/Works | Textbook Chapter 9  |
|               | Assignment     | Module 6 Video Quiz<br>My Lab Chapter 9 Quiz and Tutorial<br>Exam 1 (Chapters 1 – 8)  |
| Week 7        | Topic          | Chapter 11 - Sun  |
|               | Summary        | Structure and features of the Sun. Solar rotation and magnetic field. Source of energy.   |

| WEEK/<br>DATE | ACTIVITY       | TOPIC/ASSIGNMENT<br>(QUESTION/SUBJECT)   |
|---------------|----------------|--|
|               | Readings/Works | Textbook Chapter 11  |
|               | Assignment     | Module 7 Video Quiz<br>Module 7 Discussion<br>MyLab Chapter 11 Quiz and Tutorial<br>Project 2. Rotation of the Sun   |
| Week 8        | Topic          | Chapter 12 – Surveying the Stars   |
|               | Summary        | Stellar distances. Properties of stars. Stellar temperature, masses, and luminosity. Hertzsprung-Russell diagram. Stellar lifetimes.                                   |
|               | Readings/Works | Textbook Chapter 12  |
|               | Assignment     | Module 8 Video Quiz<br>MyLab Chapter 12 Quiz and Tutorials<br>Continue working on Project 2  |
| Week 9        | Topic          | Chapter 13 – Star Formation and Evolution  |
|               | Summary        | Properties of ISM. Stages of star formation. Stellar clusters. Evolution of low mass stars. Binary stars evolutions. Evolution of high mass stars. Types of Supernova. |
|               | Readings/Works | Textbook – Chapter 13  |

| WEEK/<br>DATE | ACTIVITY       | TOPIC/ASSIGNMENT<br>(QUESTION/SUBJECT)  |
|---------------|----------------|---|
|               | Assignment     | Module 9 Video Quiz<br>MyLab Chapter 13 quiz and tutorial<br>Project 2 Due  |
| Week<br>10    | Topic          | Chapter 14 – Death of Stars   |
|               | Summary        | White dwarfs, neutron stars, pulsars, and black holes.<br>Degeneracy pressure. Special relativity and black holes.                      |
|               | Readings/Works | Textbook – Chapter 14   |
|               | Assignment     | Module 10 Video Quiz<br>Module 10 Discussion<br>MyLab Chapter 14 quiz and tutorial  |
| Week<br>11    | Topic          | Chapters 10 and 19 – Exoplanets and Life in the Universe  |
|               | Summary        | Exoplanets: detection and properties. Main Properties of<br>Life. Life in the solar system and beyond. SETI program.<br>Drake equation. |
|               | Readings/Works | Textbook Chapters 10 and 19   |
|               | Assignment     | Module 11 Video Quiz<br>MyLab Chapters 10 and 19 quiz and tutorials   |

| WEEK/<br>DATE | ACTIVITY       | TOPIC/ASSIGNMENT<br>(QUESTION/SUBJECT)  |
|---------------|----------------|---|
|               |                | Exam 2  |
| Week<br>12    | Topic          | Chapter 15 – Our Galaxy   |
|               | Summary        | Structure of the Milky Way. Stellar motions. Galaxy formation. Masses and rotation curve. Dark matter.                                |
|               | Readings/Works | Textbook Chapter 15   |
|               | Assignment     | Module 12 Video Quiz<br>MyLab Chapter 15 quiz and tutorial  |
| Week<br>13    | Topic          | Chapter 16 – A Zoo of Galaxies  |
|               | Summary        | Properties and classification of galaxies. Galaxy clusters. Hubble Law. Quasars, radio and Seifert galaxies. Supermassive blackholes. |
|               | Readings/Works | Textbook Chapter 16   |
|               | Assignment     | Module 13 Video Quiz<br>Module 13 Discussion<br>MyLab Chapter 16 quiz and tutorial  |
| Week<br>14    | Topic          | Chapter 17 – Dark Forces and the evolution of the universe  |



| WEEK/<br>DATE | ACTIVITY       | TOPIC/ASSIGNMENT<br>(QUESTION/SUBJECT)  |
|---------------|----------------|---|
|               | Summary        | Galaxy evolution and collisions. Dark matter and dark energy. Expansion of the universe. Cosmological principle |
|               | Readings/Works | Textbook Chapter 17   |
|               | Assignment     | Module 14 Video Quiz 1<br>MyLab Chapter 17 quiz and tutorial  |
| Week<br>15    | Topic          | Chapter 18 – Origin of the Universe   |
|               | Summary        | Big Bang. Critical density and scenarios for the future of the universe. Inflation.                             |
|               | Readings/Works | Textbook Chapter 18   |
|               | Assignment     | Module 14 Video Quiz 2<br>Exam 3<br>Final Exam (Finals week)  |