

Department of Astronomy

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September 25, 2012

To the Gen Ed Committee:

We request re-approval of the GenEd P designation for Course AST1002, Discover the Universe. We have updated the course and syllabus to address the concerns of the GEC. Specifically, as shown in the syllabus, all sections have adopted a common syllabus, textbook (see pg 1 top), uniform course content (see course schedule – pg 5&6) and grading scheme (see pg 2&3). The syllabus also contains the general education objectives and SLOs and addresses the key components of the Physical Sciences SLOs such as major scientific developments and their impacts on society, logical reasoning skills, scientific criticism, techniques of discovery, and hypothesis testing. (pg 2). In addition, we have submitted our Observatory Report Form which includes instructions to the students for completing the observing project which is required of all students taking AST 1002. The questions on the form require that the students use critical thinking, scientific criticism, and hypothesis testing. In particular, in question 5, students must formulate their own hypothesis and describe a way to test this hypothesis.

Thank you for your consideration. Please let me know if you have any further questions or concerns.

Sincerely,

Elizabeth A. Lada

Professor of Astronomy

[lada@astro.ufl.edu](mailto:lada@astro.ufl.edu)

**Current Information:****I. A.) DEPARTMENT NAME:** Astronomy**B.) COURSE NUMBER, and TITLE:** AST 1002 Discover the Universe**C.) CREDIT HOURS:** 3 **D.) PREREQUISITES:** none**E.) CURRENT CLASSIFICATION**

1. General Education Code:  B  C  D  H  M  N  P  S  None
2. Writing Requirement:  E2  E4  E6  None
3. Math Requirement:  M  None

**Requests:****II. GENERAL EDUCATION**A.) Requested Classification:  B  C  D  H  M  N  P  SB.) Effective Date:  Fall  Spring  Summer 2013 (year)Or  
 1-time Approval  Fall  Spring  Summer \_\_\_\_\_ (year)**III. WRITING REQUIREMENT** **MATH REQUIREMENT** A.) Requested Classification  E2  E4  E6B.) Effective Date:  Fall  Spring  Summer \_\_\_\_\_ (year)Or  
 1-time Approval  Fall  Spring  Summer \_\_\_\_\_ (year)**C.) Assessment:**

1.) What type of feedback will be provided to the student (in reference to writing skill)?

       Grade        Corrections        Drafts        Other

2.) Will a published rubric be used?

#### IV. ATTACH A DETAILED SYLLABUS

#### V. SYLLABUS CHECKLIST

Courses that offer students General Education and/or Writing Requirement credit must provide clear and explicit information for the students about the classification and requirements.

A.) For courses with a **General Education** classification, the syllabus should include:

- Statement of the General Education Purpose of the Course with attention to the General Education Classification requested
- List of assigned General Education Student Learning Outcomes
- List of any other relevant Student Learning Outcomes
- List of required and optional texts
- Weekly course schedule with sufficient detail (e.g. topics, assigned readings, other assignments, due dates)

B.) For courses with **Writing Requirement (WR)** classification, the syllabus should include:

- "The Writing Requirement ensures students both maintain their fluency in writing and use writing as a tool to facilitate learning."
- "Course grades now have two components: To receive writing credit, a student must receive a grade of "C" or higher and a satisfactory completion of the writing component of the course."
- A statement or statements indicating that the instructor will evaluate and provide feedback on the student's written assignments with respect to grammar, punctuation, usage of standard written English, clarity, coherence, and organization
- Assignment word counts, page lengths, submission deadlines and feedback dates

Additionally, the syllabus must clearly show that the course meets the WR to

- Evaluate [2,000/4,000/6,000] written words in assignments during the semester
- Provide all feedback on assignments prior to the last class meeting

**Important note:** The following types of writing assignments **CANNOT** be used to meet the WR: teamwork, exam essay questions, take-home exams, and informal, ungraded writing assignments.

## VI. SUBMISSION AND APPROVALS

Department Contact:

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College Contact:

College Name: CLAS

College Contact Name: David Pharies

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***Discover the Universe***  
**AST1002**  
**General Syllabus**

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**Instructor:**

**Office:**

**Telephone:**

**Email:**

**Lecture time and place:**

**Office hours:**

**Class web site:** [www.astro.ufl.edu/ast1002](http://www.astro.ufl.edu/ast1002)

**Required Text:** *Astronomy: A Beginner's Guide to the Universe*, Sixth Edition by Chaisson & McMillan, Pearson Press.

**Pre-requisites and Co-requisites:** None

**Credits:** 3

**Course Content:** 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. Although this is essentially a non-mathematical science course, a very basic knowledge of mathematics is required. Our goal is to help you 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:

- Motions of the sky
- A historical development of our understanding of the solar system: An example of the scientific method
- Light and telescopes
- The properties of the planets within our solar system
- The nature and lives of stars
- The nature of our Milky Way Galaxy
- Properties of other galaxies
- The origin and fate of the Universe
- The search for extraterrestrial life.

**General Education:**

AST 1002, Discover the Universe, is a GenEd physical science (P) course. As the list of topics above demonstrates, the course covers not only the Universe and the bodies in it -- planets, moons, stars, galaxies, etc. -- but also how we know about those things, making

use of our understanding of the underlying physics of orbits and radiation. The course will focus on major scientific developments in astronomy & astrophysics and their impacts on society and the environment.

**Course and Gen Ed Student Learning Objectives & Outcomes:**

- To provide students with a broad overview of modern astronomy. This will be accomplished through lectures and weekly reading assignments. Students will be able to define common astronomical terms and explain basic concepts and theories for a range of astrophysical phenomena.
- To teach students the scientific process and how we can understand the Universe using basic physical laws derived on Earth. This will be accomplished through lectures and in-class discussions as well as homework assignments. Students will gain an understanding of how the scientific method is applied to the field of astronomy.
- 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, evaluating the validity of astrology, comparing energy sources, and how atmospheric effects of planets influence climate change. Students will be able to critically evaluate the difference between good science and bad science. Evaluations will be based on in-class discussions, exams and observing project.
- To teach scientific reasoning. Scientific reasoning is the use of logic, observations, and critical thinking to interpret the world around you. This will be accomplished through in-class discussions, homework assignments and the observing project. 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 you well in your daily lives regardless of what career you pursue.
- To improve scientific literacy. Literacy in the basic concepts and terminology of science is necessary if you wish to follow science stories in the news or make informed decisions (such as voting) on issues that pertain to science. This will be accomplished through in-class discussions about current news topics in astronomy and as part of the observing project.
- To help students learn to communicate scientific ideas clearly and effectively using oral, written or graphic forms. This will be done through in-class discussions (oral) and as the written component of the observing project.

**Grading Information:**

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

In class exams – (2 exams -15% each)	<b>30%</b>
Cumulative Final Exam	<b>30%</b>
Observing Project	<b>20%</b>
Homework & Quizzes	<b>20%</b>

**Grading scale:**

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-	57 - 59	0.67
B	80 - 83	3.0	C-	67 - 69	1.67	E	< 56	0

**Examinations (60% of grade):** Two in-class examinations will be given during the semester. The final exam (30% of grade) will be comprehensive and given during final exam period. These exams will test the student's content knowledge but will emphasize applying critical thinking skills.

**Observing Projects (20%):** One of the most enjoyable aspects of astronomy is actually observing the sky either with the eyes, binoculars or a telescope. Students are expected to attend an observing session at the campus observatory. These take place every clear Friday evening during the semester (directions to the observatory and times are provided in lecture and on the class web site). For your visit, you must complete an observing form (download from the class web site) describing in detail the objects that you observe through the telescopes and explaining their astronomical significance. As part of this project you will research an object you observed using recent news or popular science articles and report on what you have learned beyond what has been discussed in lecture. You will also formulate your own hypothesis about an object you observed and explain how you would test this hypothesis using modern telescopes and instrumentation. See observing form for more details. Finally, you must also obtain a special token for each visit from the staff at the observatory and attach it to your form. Remember to put your name on your form. *Do not wait until the due date - it may be cloudy!*

**Homework & Quizzes (20%):**

Homework and quizzes will be used during the semester to facilitate and reinforce students understanding of the course material and encourage critical thinking.

**Attendance, Class Participation and Conduct Policy:**

- Attendance at lectures is expected.
- Students should arrive on time and not get ready to leave until the lecture is finished.
- Reading assignments will be given approximately once each week. These will consist of reading pages/chapters from the textbook. Students will read material that will be covered by the lecture the following week.
- In order to stimulate critical thinking and gauge how well you understand the material, questions based on the lectures, reading assignments and projects/homework will be posed in class. Students should participate in the lecture by answering these questions and also by asking your own questions.

**Make-up Policy:**

Students are expected to complete all requirements by the specified due dates. If a student misses class or 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.

**Academic Honesty Policy:**

- 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 caught cheating will be referred to the Honor Code Chancellor.
- 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."*

**Accommodations for Students with Disabilities:**

- Students who require a classroom accommodation for a disability are required to arrange accommodations with the Disability Resource Center.
- Students must first contact the Dean of Students Office of Disability Resources in Peabody 202 (phone: 352-392-1261). Please see the University of Florida Disability Resources website for more information at: <http://www.dso.ufl.edu/drp/services/>.
- The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

**UF Counseling Services:**

- On-campus resources are available at the UF Counseling & Wellness Center (392-1575) for students experiencing personal or stress related problems.



### Course & Lecture Schedule

Lecture Date	Lecture Content	Weekly Reading Assignment
Week 1	Charting the Heavens – An introduction to the basic concepts in astronomy such as distances, constellations, Sun-Moon-Earth configurations that result in Moon phases and Solar and Lunar eclipses.	Prologue
Week 2	Modern Astronomy & Understanding the Solar System – Learn 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 as well as the impact of key astronomical discoveries on society.	Chapter 1
Week 3	Properties of Light & Tools of Astronomy – Learn the nature of light and how astronomers observe various light wavelengths with telescopes to learn about astrophysical phenomena.	Chap 2,3
Week 4	Earth & Moon – Learn about the Earth and Moon as well as their relationship to each other and Moon exploration. Climatological changes and human impact are discussed.	Chap 5
Week 5	Terrestrial Planets – Properties of the inner planets are discussed and compared to Earth. <b>Exam 1</b>	Chap 6
Week 6	Jovian Planets – Properties of the outer gas giants are discussed and compared to Earth.	Chap 7
Week 7	Moons, Rings, Asteroids, Meteors & Comets – Learn about the nature of these other constituents of the Solar System which reveal clues about our planetary system and formation.	Chap 8
Week 8	Formation of the Solar System – Using the scientific method and observations presented in this class, we discuss likely scenarios for the formation of our Solar System.	Chap 4
Week 9	Properties of 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	Chap 10

	to estimate stellar masses.	
<b>Week 10</b>	Sun, Nuclear Fusion and the Interstellar Medium – Properties of the Sun and the mechanics of nuclear fusion are discussed. Learn the properties of the material between the stars known as the ISM. <b>Exam 2</b>	Chap 9,11
<b>Week 11</b>	Star Formation & Stellar Evolution – Discover how stars form out of the ISM. Follow the timeline for a typical, Sun-like star from infancy to death.	Chap 12
<b>Week 12</b>	Stellar Remnants & Black Holes – Learn about the dense remnants of high mass stars and discuss the unusual gravitational effects observed near Black Holes.	Chap 13
<b>Week 13</b>	The Milky Way & other Galaxies – Learn the properties of our Milky Way galaxy and how the scientific method has been used to uncover the nature of this large system of stars, gas and dust. Discover the different types of galaxies in the Universe and how they compare to the Milky Way.	Chap 14,15
<b>Week 14</b>	Galaxies & Dark Matter – Discover the importance of dark matter and how it has been identified in galaxies and larger scale structures. Learn about galaxy interactions and mergers and galaxy evolution.	Chap 16
<b>Week 15</b>	Cosmology & Life in 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, leading to the existence of life in the Universe.	Chap 17,18
<b>Exam Week</b>	<b>Final Exam</b>	Cumulative – all chapters

# Observatory Report

## AST1002

**Attach Token Here:**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

You must obtain a token from the observatory staff during your visit to the observatory.

1. Make a sketch of both objects you observe at the Campus Teaching Observatory. Include the type of object (e.g. planet), name (e.g. Jupiter) and approximate distance of each object from Earth (you may look for this information in your textbook or online but please give a reference for your number).

Object Name:

Object Type:

Object Distance:

Sketch:

Object Name:

Object Type:

Object Distance:

Sketch:

2. Describe what you observed through the telescope. Try to be as detailed and specific as possible. For example, describe the color or shape of each object. Describe only what you saw through the telescope, NOT what you think it should look like or what it looks like in pictures. If it varied much from your expectations, please describe how and explain why you think it looks different. (Use extra pages if needed.)

3. Explain the nature and astronomical significance of the objects you observed. Look for this information in your textbook or online. Give a reference for where you found your information. (Use extra pages if needed.)

4. Choose one of your objects. Find a news article written about this object or class of objects published in the last 5 years. Briefly summarize the article. Based on information learned in class, do you find the reporting in this article to be accurate? Does it contain any errors? Did it present new information about the object(s) that you did not already know? Please reference your article.

5. Choose one of your objects (it can be the same one used in #4). Formulate a question and hypothesis concerning this object or object type. Using information about telescopes and wavelengths of light (from textbook or other sources), come up with a way to test your hypothesis and attempt to answer your question. Remember that different wavelengths of light can be used to learn about different physical processes. Some issues to consider: Would you need the biggest telescopes on Earth, or could a smaller one be used? Do you need images or spectra? Would you need to observe the object several different times or just once?