Physics 1303.D10
Fundamentals of Astronomy

Summer I 2018

Course Information

Instructor
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Office Hours: By appointment

Course Description

Physics 1303, Fundamentals of Astronomy, is a three credit hour introductory study of the current knowledge and techniques of astronomy and astrophysics. Broad topics in the field will be covered, but the emphasis will be on stellar astronomy and cosmology.
Required Materials

21st Century Astronomy 5th Edition by Kay, Palen, & Blumenthal
ISBN: 978-0-393-60333-0

The ASU Bookstore has the loose leaf version of the book with Ebook and SmartWork registration. There is also an Ebook only version with SmartWork registration.

SmartWork registration IS NOT required for this course – there will be no homework or other assignments using Smartwork. Everything in this course will be done through Blackboard.

Optional Software

Starry Night College planetarium software is suggested for your personal use only. There will be no required assignments using this software for this class. However, purchasing this software is a requirement if you are taking the laboratory that goes along with this course (PHYS 1103).

When ordering your student version of Starry Night College, use the referral code: omeh7t
Goals, Objectives, and Outcomes

General Course Goals

There are two general goals for Physics 1303.

1. After completing the Fundamentals of Astronomy course, you should be able to comprehend, apply, and analyze the most important scientific models governing modern astrophysics and be familiar with the astronomical objects studied by astronomers.

2. After completing the Fundamentals of Astronomy course, you should be able to comprehend, apply, and analyze the practices and methodologies used by modern astronomers in constructing astrophysical models.

Course Objectives

Upon completion of the Fundamentals of Astronomy course, you should be able to:

1. Recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry used in modern astrophysics and to communicate the findings, analyses, and interpretations in writing.

2. Identify and recognize the differences among competing modern astrophysical scientific theories.

3. Demonstrate the ability to translate, interpret, and extrapolate the most important scientific models governing modern astrophysics, the practices and methodologies used by modern astronomers in constructing astrophysical models, and to be familiar with the astronomical objects studied by astronomers.

4. Further develop critical/logical thinking, scientific reasoning, and problem solving skills in the area of astrophysics.

Learning Outcomes

When you complete this course, you should be able to apply the following intellectual skills to astrophysical concepts:

- **Knowledge**: define, recite, describe, label, list
• **Comprehension:** explain, predict, summarize, translate
• **Application:** change, compute, construct, predict
• **Analysis:** compare, contrast, diagram, infer
• **Synthesis:** combine, compose, create, revise, summarize
• **Evaluation:** appraise, compare, critique, contrast

**Course Administration**

**Late Work**

• Unexcused late work or missed tests will not be accepted.
• If your assignments are not submitted by the posted deadline you will receive a zero for that assignment.
• You must contact your professor **before** the assignment is due if you believe it will be late or as soon as possible after the due date in the case of an unexpected emergency.

**Academic Integrity**

Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding and complying with the university **Academic Honor Code** and the ASU Student Handbook.

**Accommodations for Disabilities**

The Student Life Office is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student’s responsibility to initiate such a request by contacting the Student Life Office. The Student Life Office will establish the particular documentation requirements necessary for the various types of disabilities.

**Religious Holidays**

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who fails to do class work for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.
Assessing Outcomes & Grade Determination

Method of Assessing Outcomes
Student learning outcomes will be assessed with:

- Chapter Quizzes – 10 questions per chapter will be given as a short quiz. You will have two (2) attempts at the quiz, but questions are randomized so you will likely not get the same questions both times, and your second attempt counts if you take it twice, regardless of the score (higher or lower than the first). Quizzes for chapters assigned each week are all due on Friday (except for the last week, which is due Tuesday).
- Four Conceptual Activities from the textbook, each worth 20 points and due on Saturday of each of the first four weeks.
- Four Unit Tests worth 40 points each, due on Sunday of each of the first four weeks.
- A Final Exam worth 100 points due on July 3.

NOTE: Blackboard issues will arise, if you wait until the last minute to complete assignments you run the risk of missing them. I can fix problems such as browser crashes and internet outages, but NOT the hour before it is due. You have an entire week to complete work, so due dates are firm.

Grade Determination
Your final grade will be determined by your scores on all tests and exams.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Location</th>
<th>Points</th>
<th>Percentage</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter Quizzes</td>
<td>Blackboard</td>
<td>160</td>
<td>32%</td>
<td>Fridays</td>
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<tr>
<td>Conceptual Activities</td>
<td>Blackboard</td>
<td>80</td>
<td>16%</td>
<td>Saturdays</td>
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<tr>
<td>Unit Tests</td>
<td>Blackboard</td>
<td>160</td>
<td>32%</td>
<td>Sundays</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Blackboard</td>
<td>100</td>
<td>20%</td>
<td>July 3</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>500</strong></td>
<td><strong>100%</strong></td>
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Angelo State University employs a letter grade system. Grades in this course are determined on a percentage scale:

A = 90-100%
B = 80-89%
C = 70-79%
D = 60-69%
F = 59% and below
Course Outline

Reading Assignments and Other Important Class Assignments
All reading assignments are in the required text – 21st Century Astronomy
NOTE: “end of the day” means 11:59 PM

WEEK 1 (June 4 – 8): Background Science
Read Chapter 1, Why Learn Astronomy?
Read Chapter 3, Motion of Astronomical Bodies
Read Chapter 4, Gravity and Orbits
Read Chapter 5, Light
Read Chapter 6, The Tools of the Astronomer
Chapter Quizzes due by the end of the day June 8
Logical Fallacies test due by the end of the day June 9
Unit Test #1 is due by the end of the day June 10

WEEK 2 (June 11 – 15): Stellar Properties and Star Formation
Read Chapter 13, Taking the Measure of Stars
Read Chapter 14, Our Star – The Sun
Read Chapter 15, The Interstellar Medium and Star Formation
Chapter Quizzes due by the end of the day June 15
H-R Diagram test is due by the end of the day June 16
Unit Test #2 is due by the end of the day June 17

WEEK 3 (June 18 – 22): Life Cycle of Stars
Read Chapter 16, Evolution of Low-Mass Stars
Read Chapter 17, Evolution of High-Mass Stars
Read Chapter 18, Relativity and Black Holes
Chapter Quizzes due by the end of the day June 22
Low-Mass Stellar Evolution test due by the end of the day June 23
Unit Test #3 is due by the end of the day June 24
WEEK 4 (June 25 – 29): Galaxies
Read Chapter 19, Galaxies
Read Chapter 20, The Milky Way – A Normal Spiral Galaxy
Read Chapter 21, The Expanding Universe
*Chapter Quizzes due by the end of the day June 29*
*Center of the Milky Way test due by the end of the day June 30*
*Unit Test #4 is due by the end of the day July 1*

WEEK 5 (July 2 – 3): Cosmology and the Universe
Read Chapter 22, Cosmology
Read Chapter 23, Large-Scale Structure in the Universe
*Chapter Quizzes due by the end of the day July 3*
*FINAL EXAM is due by the end of the day July 3*