Physics 2371.010
Topics in Astronomy

Fall 2017

Course Information

Meeting Place & Time
VIN 147
TR 09:30-10:45 AM

Instructor
Dr. Kenneth Carrell
Office: VIN 119
Phone: (325) 942-2136
Email: kenneth.carrell@angelo.edu
Office Hours: MR 1-3 PM, W 1-2 PM, M-F 10am-12pm (if no groups)

Course Description

Physics 2371, Topics in Astronomy, is a three credit hour overview of relevant and current topics related to modern astronomy and astrophysics. Covered material will include the birth of astronomy as a science, NASA and the development of the space program, and the latest discoveries and research.
**Required Materials**

There will be no required text for this course, however, material will be pulled from various sources that may be beneficial to purchase and/or acquire. A list of these will be provided as needed.

**Optional Software**

Starry Night College planetarium software is suggested for your personal use only. There may be required assignments using this software for this class. However, there are computers in the MCS 111 computer lab that can be used to complete the assignments.

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

General Course Goals
There are three general goals for Physics 2371.

1. After completing the Topics in 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 Topics in Astronomy course, you should be able to comprehend, apply, and analyze the practices and methodologies used by modern astronomers in constructing astrophysical models.
3. After completing the Topics in Astronomy course, you should have a broader understanding and appreciation of the intellectual and cultural benefits gained through astronomy as a science.

Course Objectives
Upon completion of the Topics in 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 both modern and historic 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

Class Attendance

- Class attendance is both an ASU and course requirement.
- You are expected to attend all scheduled class meetings.
- You are responsible for all course material and information that is presented in class.
- If you miss class, get the class notes and information from a fellow student.
- Attendance (or lack thereof) often makes a difference in your success in this class.

Late Work

- **Unexcused late work or missed tests will not be accepted.**
- If your assignments are not submitted by the posted deadline or if you miss an in-class test, 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:

- Daily/weekly work – various homework and in-class assignments will be given throughout the semester.
- Each topic will have an activity associated with it. These will range from hands-on activities to research papers on specific topics. Some will be group projects and others individual.
- Each topic will also have a test at the end over the material covered for that particular topic.
- Extra credit will be given for attending public planetarium shows. You can get 1 point on your overall average for attending each of the four different shows this semester once. This is a possible total of 4% and will only add
to your grade (it can never lower it). Public shows are Thursday nights at 7 & 8 PM. If you come to all 4 shows I will give an extra point giving a possible total of 5% added to your overall grade.

**Grade Determination**

Your final grade will be determined by your scores on all homework, projects, tests and exams plus any extra credit points earned throughout the semester.

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<tbody>
<tr>
<td>Homework &amp; Quizzes</td>
<td>20%</td>
</tr>
<tr>
<td>Activities &amp; Projects</td>
<td>40%</td>
</tr>
<tr>
<td>Topic Tests</td>
<td>40%</td>
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<tr>
<td><strong>TOTAL</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

**Final course grades will also be determined in part based on attendance as follows:**

<table>
<thead>
<tr>
<th>Number of Absences</th>
<th>Highest Grade Possible</th>
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<tbody>
<tr>
<td>0-4 (&gt;85% attendance)</td>
<td>A</td>
</tr>
<tr>
<td>5-7 (75-85% attendance)</td>
<td>B</td>
</tr>
<tr>
<td>8-10 (65-75% attendance)</td>
<td>C</td>
</tr>
<tr>
<td>11-13 (55-65% attendance)</td>
<td>D</td>
</tr>
<tr>
<td>14+ (&lt;55% attendance)</td>
<td>F</td>
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List of Topics and Approximate Scheduling
(NOTE: this is subject to change both in topics covered and length of time spent to accommodate class and professor preferences)

• Mathematics of Astronomy (2-3 weeks)
  o Necessary math background for this course and PHYS 3371

• Misconceptions and Misuses of Astronomy (2 weeks)
  o Various common misconceptions and the science of why they are wrong

• Pre-astronomy (2 weeks)
  o Naked-eye observations, alignments of prehistoric sites, calendar systems, development of modern astronomy

• History of the Telescope (1 week)
  o Different telescope designs and the use of the telescope as a scientific instrument

• NASA (4 weeks)
  o Manned spaceflight, unmanned missions, and future missions

• History of the HR Diagram (1 week)
  o Draper’s catalog and the people involved with it

• Search for Life in Other Places (2 weeks)
  o Fermi’s Paradox, Drake Equation, Exoplanets, etc