Physics 1304
Astronomy of the Solar System

Spring 2019

Course Information

Meeting Place & Time
ASU Planetarium (VIN P-02)
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 1-2 PM, M-F 11am-12pm (by appointment)

Course Description

Physics 1304, Astronomy of the Solar System, is a three credit hour introductory study of the current knowledge and techniques of planetary astronomy. Broad topics in the field will be covered, but the emphasis will be on the birth of modern planetary astronomy and planetary geology.
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.

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 1104).

When ordering your student version of Starry Night College, use the referral code: omeh7t
Planetarium Class Etiquette

- No food, drinks, or tobacco products are allowed in the planetarium or the outer lobby area.
- Please do not leave trash in the planetarium or lobby.
- Please do not disturb fellow students during class time.
- Please do not put your feet up on the chair in front of you.
- Silence cell phones and other electronic devices.
- No texting/messaging during class.
- Please let me know if you will be using any electronic device during class.

Goals, Objectives, and Outcomes

General Course Goals
There are two general goals for Physics 1304.

1. After completing the Astronomy of the Solar System course, you should be able to comprehend, apply, and analyze the most important scientific models governing modern solar system astronomy and planetary geology and be familiar with the properties of the planets and smaller members of the solar system studied by planetary astronomers.

2. After completing the Astronomy of the Solar System course, you should be able to comprehend, apply, and analyze the practices and methodologies used by modern astronomers in constructing planetary 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 solar system astronomy and planetary geology and to communicate the findings, analyses, and interpretations in writing.

2. Identify and recognize the differences among competing modern planetary science scientific theories.
3. Demonstrate the ability to translate, interpret, and extrapolate the most important scientific models governing modern planetary science, the practices and methodologies used by modern planetary astronomers in constructing planetary models, and to be familiar with the solar system objects studied by astronomers.

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

**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

**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.
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.
- Attendance will be taken for each class meeting.
- Students will complete and return in-class quizzes and/or initial the sign-in sheet for each class attended.
- 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.
- ANY STUDENT CAUGHT SIGNING IN FOR ANOTHER STUDENT WILL RESULT IN ALL PARTIES BEING DROPPED 1 (ONE) LETTER GRADE.

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.

Assessing Outcomes & Grade Determination

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

- Quizzes/Worksheets (35%) will be given throughout the semester, both in class and on Blackboard. Assignments and due dates will be announced in class.
- Four Conceptual Activities (15%) from the 21st Century Astronomy textbook with due dates listed in the Course Outline below.
- Three midterm exams (30%) will be given throughout the semester with due dates listed below in the Course Outline.
- A comprehensive Final Exam (20%) on May 9.
• Extra credit will be given for attending public planetarium shows. You can get 1% of your final grade for attending each of the four different shows this semester once. If you come to all 4 different shows I will give an extra 1%, which means you have the potential for half a letter grade extra credit (5%). Public shows are Thursday nights at 7 & 8 PM.

**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 multiple days 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>Percentage</th>
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<tbody>
<tr>
<td>Quizzes/Worksheets</td>
<td>Blackboard</td>
<td>35%</td>
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<tr>
<td>Conceptual Activities</td>
<td>Blackboard</td>
<td>15%</td>
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<tr>
<td>Midterm Exams</td>
<td>Blackboard</td>
<td>30%</td>
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<tr>
<td>Final Exam</td>
<td>Planetarium</td>
<td>20%</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td></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>
</tr>
</thead>
<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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Course Outline

Reading Assignments and Other Important Class Assignments
NOTE: “end of the day” means 11:59 PM but assignments are timed and will not be available to start all the way until that time

WEEK 1 (January 14 – 18):
Read Chapter 1, Why Learn Astronomy?

WEEK 2 (January 22 – 25):
Read Chapter 2, Patterns in the Sky – Motions of Earth and the Moon
Logical Fallacies test due by the end of the day January 25

WEEK 3 (January 28 – February 1):
Read Chapter 3, Motion of Astronomical Bodies

WEEK 4 (February 4 – 8):
Read Chapter 4, Gravity and Orbits
Phases of the Moon test is due by the end of the day January 8

WEEK 5 (February 11 – 15):
Read Chapter 6, Tools of the Astronomer
Midterm Test #1 due by the end of the day February 15

WEEK 6 (February 18 – 22):
Read Chapter 7, The Birth and Evolution of Planetary Systems

WEEK 7 (February 25 – March 1):
Earth – parts of Chapters 8 & 9 along with material presented in class
Exploring Extrasolar Planets test due end of the day March 1

WEEK 8 (March 4 – 8):
The History of Spaceflight – material presented in class

SPRING BREAK: March 11 – 15

WEEK 9 (March 18 – 22):
Mercury & Venus – parts of Chapters 8 & 9 along with material presented in class
WEEK 10 (March 25 – 29):
Mars – parts of Chapters 8 & 9 along with material presented in class
*Midterm Test #2 due by the end of the day March 29*

WEEK 11 (April 1 – 5):
Jupiter – parts of Chapters 10 & 11 along with material presented in class

WEEK 12 (April 8 – 12):
Saturn – parts of Chapters 10 & 11 along with material presented in class
*Measuring Features on Io test due by end of day April 12*

WEEK 13 (April 15 – 19):
Uranus, Neptune, & Dwarf Planets – parts of Chapters 10, 11, & 12 along with material presented in class

WEEK 14 (April 22 – 26):
Asteroids, Comets, & Small Solar System Bodies – parts of Chapter 12 along with material presented in class
*Midterm Test #3 due by the end of the day April 26*

WEEK 15 (April 29 – May 3):
Exoplanets & Life – parts of Chapter 24 along with material presented in class

*FINAL EXAM is Thursday May 9 from 8:00-10:00am*