Physics 1104
Solar System Astronomy Laboratory

Spring 2019

Course Information

Meeting Place & Time
ASU Planetarium (VIN P-02)
Thursday 03:00-04:50 PM

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 1104, Solar System Astronomy Laboratory, is a one 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 planetary astronomy and planetary geology.
Required Materials

The Norton Starry Night Workbook by Desch & Marks

This workbook comes with a download code for the Starry Night College software. Both the software and workbook are required for this course. Starry Night College is a realistic and user-friendly planetarium simulation program that is designed to allow you to perform observational activities on your computer.

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 1104.

1. After completing the Solar System Astronomy Laboratory course, you should be able to apply the scientific method used by scientists as you complete simulated astronomical observations using Starry Night College software.
2. After completing the Solar System Astronomy Laboratory course, you should be able to apply the processes, practices, and methodologies used by modern astronomers in constructing astrophysical models.

Course Objectives
Upon completion of the Solar System Astronomy Laboratory 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

#### 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 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 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.

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**Assessing Outcomes & Grade Determination**

**Method of Assessing Outcomes**

- Student learning outcomes will be assessed through tests administered on *Blackboard* for each of the completed labs.
- Make sure you complete each lab before you attempt to take the test.
- You will **not** have enough time to do the lab and take the test at the same time. All tests are timed with a limit of 30 minutes and once started, the test must be completed in one sitting.
- DO NOT leave the test before clicking **Save and Submit**.
Grade Determination
Your final grade will be determined by your scores on all lab tests. There are 14 tests worth 25 points each giving a total of 350 possible points.

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

An extra credit lab will also be available to help raise your grade.

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>0-2 (&gt;85% attendance)</td>
<td>A</td>
</tr>
<tr>
<td>3 (79% attendance)</td>
<td>B</td>
</tr>
<tr>
<td>4 (71% attendance)</td>
<td>C</td>
</tr>
<tr>
<td>5-6 (55-65% attendance)</td>
<td>D</td>
</tr>
<tr>
<td>7+ (&lt;=50% attendance)</td>
<td>F</td>
</tr>
</tbody>
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Course Outline
Getting Started

- Download *Starry Night College* software on to your computer. The software download instructions are given on the inside cover of your *Starry Night Workbook*.
- Alternatively, you can also access *Starry Night College* in the MCS 111 computer lab (computers 10-44), but you will still need to purchase the *Starry Night Workbook* to have access to the Student Exercise instructions and answer sheets.
- Make sure you read the Preface (p. vii) and Quick Tips (p. ix) in the workbook.
Action Plan
Follow this plan as you work your way through each lab assignment:

1. Labs will be assigned on the day of our class meeting each week (Thursday at 3 PM). I will give you pre-lab instructions in class. This usually takes 30 minutes or less.
2. Go to the site that you choose to complete this lab (either the MCS 111 computer lab or use your personal computer).
3. Follow the instructions (LAB INSTRUCTIONS tab in Blackboard) for each lab carefully and fully.
4. Do each lab as assigned (see lab assignment schedule below), answering all the questions and/or recording data on the Starry Night Workbook answer sheet or on the Starry Night Work Sheets (available on our Blackboard site).
5. I recommend that you do the labs on the day they are assigned, since you will already have a two-hour block of time built into your schedule for this class.
6. After you complete the lab, take the Blackboard lab quiz (look in the LAB TESTS tab).
7. Make sure you submit the test when you complete it and that you meet the deadline for submission for the test.
8. You can use your completed workbook answer sheet pages or work sheets to help you while taking the test.
9. You do not have to turn in the answer sheet from the Starry Night Workbook or the work sheets.
10. Grades will be reported in Blackboard (Tools/My Grades).

Laboratory Assignments and Due Dates
NOTE: “End of the day” means 11:59 PM and tests are unavailable after 11:30 PM

Jan 17 – Lab 1 – Starry Night Tutorial
Blackboard test due by the end of the day Sunday Jan 20.

Jan 24 – Lab 2 – Starry Night Student Exercises A1, A2, A3, A4, A5
Blackboard test due by the end of the day Sunday Jan 27.
Jan 31 – Lab 3 – Starry Night Student Exercises A6, A7, A8, A9, & A13
**Blackboard test due by the end of the day Sunday Feb 3.**

Feb 7 – Lab 4 – Precession (p. 33 in workbook)
**Blackboard test due by the end of the day Sunday Feb 10.**

Feb 14 – Lab 5 – Starry Night Student Exercises A10, A11, & A12 AND Motion of the Moon (p. 15 in workbook)
**Blackboard test due by the end of the day Sunday Feb 17.**

Feb 21 – Lab 6 – Starry Night Student Exercises B1, B2, B3, B4, & B5 AND Kepler’s Laws (p. 39 in workbook)
**Blackboard test due by the end of the day Sunday Feb 24.**

Feb 28 – Lab 7 – Flying to Mars (p. 43 in workbook)
**Blackboard test due by the end of the day Sunday Mar 3.**

Mar 7 – Lab 8 – Starry Night Student Exercises B6, C1, C2, C4, & C5
**Blackboard test due by the end of the day Sunday Mar 10.**

Mar 21 – Lab 9 – The Moons of Jupiter (p. 47 in workbook)
**Blackboard test due by the end of the day Sunday Mar 24.**

Mar 28 – Lab 10 – The Rings of Saturn (p. 53 in workbook)
**Blackboard test due by the end of the day Sunday Mar 31.**

Apr 4 – Lab 11 – Starry Night Student Exercises D1, D2, D3, & D4
**Blackboard test due by the end of the day Sunday Apr 7.**

Apr 11 – Lab 12 – Pluto and Kuiper Belt Objects (p. 57 in workbook)
**Blackboard test due by the end of the day Sunday Apr 14.**

Apr 18 – Lab 13 – Asteroids (p. 61 in workbook)
**Blackboard test due by the end of the day Sunday Apr 21.**

Apr 25 – Lab 14 – Motion of the Sun Along the Ecliptic (p. 11 in workbook)
**Blackboard test due by the end of the day Sunday Apr 28.**

**Extra Credit** – Lab 15 – The Celestial Sphere (p. 1 in workbook)
**Blackboard test due by the end of the day Sunday Apr 28.**