Physics 3170.010
Observational Methods in Astronomy

Fall 2017

Course Information

Meeting Place & Time
VIN 158
W 02:00-04:50 PM

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 3170, Observational Methods in Astronomy, is a one credit hour laboratory covering modern techniques used by astronomers to collect and analyze data from various sources. Emphasis will be on the use of data to determine physical properties of astronomical objects.
Required Materials

There will be no required text for this course. All material needed to complete assignments will be provided or obtained by the student.

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. When ordering your student version of Starry Night College, use the referral code: 0meh7t

Other software may be used to complete projects, a list of which and where to acquire it will be provided as needed.
Goals, Objectives, and Outcomes

General Course Goals
There are two general goals for Physics 3170.

1. After completing the Observational Methods in Astronomy course, you should have developed specific skills and competences needed by professionals in the field of astronomy.
2. After completing the Observational Methods in Astronomy course, you should be able to comprehend, apply, and analyze the practices and methodologies used by modern astronomers when acquiring and analyzing astronomical data of different types.

Course Objectives
Upon completion of the Observational Methods in Astronomy course, you should be able to:

1. Identify and recognize modern techniques used by astronomers to collect and analyze data from astronomical sources.
2. Demonstrate the ability to plan and implement observations of astronomical objects using appropriate techniques and tools.
3. Demonstrate the ability to determine physical properties of astronomical objects using modern data collection and analysis techniques.
4. Demonstrate the ability to effectively communicate the results of astronomical observations.
5. 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.
- If you miss class, get the class notes and information from a fellow student and contact me as soon as possible to complete the work you miss.
- 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:

- Each week we will cover a relevant topic to observational astronomy and/or complete a laboratory type activity related to an astronomical measurement. These will range from researching and writing about various things to hands on activities in class to the manipulation of actual astronomical data.
- Some form of a lab write-up will be required for each lab we do and will be due the following week.

**Grade Determination**

Your final grade will be determined by your scores on all labs/activities/projects completed throughout the semester.

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
(Subject to change based on various factors.)

August 30 – Detectors
September 6 – Observational Instruments
September 13 – CCD Image Processing
September 20 – HR Diagram of a Star Cluster
September 27 – The Spectrum of Saturn
October 4 – McDonald Observatory Data*
October 11 – Spectral Typing of Stars
October 18 – Hubble Law
October 25 – Star Formation in Galaxies
November 1 – Exoplanet Detections
November 8 – Solar Observations
November 15 – Projects*
November 29 – Projects*