Course Number: PHYS 1303

Course Title: Fundamentals of Astronomy

Instructor Name: Fred L. Wilson, Ph. D.
Office Location: VIN 135
(325) 486-6984
fwilson@angelo.edu
Office Hours: M-F 2-4 PM (or virtual)

Please feel free to contact me if you have any problems whatsoever in this course—or if you're doing well, and just want to talk about the wonders and mysteries of the universe. It's in all our interests, and I care, that you do well! The best way to contact me is by personal in-office visit, or by e mail. Telephone is often less useful because the visual aspect is missing and it is often important if I am to respond properly to you.

Course Description/Overview

This course is a three hour introduction to stellar astronomy. A separate laboratory course can be taken. The sequence of astronomy courses (PHYS 1303 and PHYS 1304) plus labs (PHYS 1103 and PHYS 1104) satisfy the eight-hour physical science with lab requirement for most degree programs. This course can be used for elective credits in most degree programs. PHYS 1303, Fundamentals of Astronomy, is an introduction to astronomy covering night sky observations, the techniques and methods of modern astronomy, and basic concepts related to the Sun, stars, our galaxy, other galaxies, the large scale structure of the universe, and cosmology, the study of the origin and evolution of the universe. This is an eight-week, online course that begins on first week of the semester and runs for 8 weeks.

Course Bibliography and Required Readings:

Understanding Our Universe by Palen, Kay, Smith, Blumenthal. Edition 2
Publisher: Norton

It is essential that you obtain a recent version of the text. You are expected to read, review and practice all of the content in this course. If you choose, you may download a free book, Astronomy from

Prerequisites

There are no prerequisites for this course.
Technical skills required for this course

As with all online courses, students must be able to operate a computer and have the necessary technical skills to navigate around a web page. Additional technical skills are not a prerequisite for this course, however your computer must meet minimum requirements to operate Blackboard. **NOTE: You will NOT be able to do this course using a phone only. You will find it difficult if not impossible using only a pad as well.**

Time spent on this course

Students can expect to spend a minimum of 6 hours per week to complete all the readings and assignments. The lessons themselves take as long as the student will require to read the materials and watch or listen to media presentations. Assignments are due throughout the week, so it is not possible to do the course successfully by doing it only on weekends.

Goals, Objectives, and Outcomes

Course Goals

Apart from the utility of Astronomy in the ordinary sense of the word, the study of the science is of the highest value as an intellectual training. No other science so operates to give us on the one hand just views of our real insignificance in the universe of space, matter, and time, or to teach us on the other hand the dignity of the human intellect as the offspring, and measurably the counterpart, of the Divine; able in a sense to “comprehend” the universe, and know its plan and meaning. The study of the science cultivates nearly every faculty of the mind; the memory, the reasoning power, and the imagination all receive from it special exercise and development. By the precise and mathematical character of many of its discussions it enforces exactness of thought and expression, and corrects that vague indefiniteness which is apt to be the result of pure literary training. On the other hand, by the beauty and grandeur of the subjects it presents, it stimulates the imagination and gratifies the poetic sense. In every way it well deserves the place which has long been assigned to it in education.

Course Objectives:

The following two objectives are the major performance goals for the course.

**Objective One:** After completing this course you should comprehend the most important scientific models governing modern astrophysics and be familiar with the astronomical objects studied by astronomers.

**Objective Two:** After completing this course you should comprehend the practices and methodologies used by modern astronomers in constructing astrophysical models.

In addition, there are multiple learning objectives for each of the 8 weeks of the course. I won’t burden you with listing them all, but if you are so inclined to know the nitty-gritty details, feel free to ask.
Learning Outcomes

When you finish this course you should be able to:

1. Apply scientific reasoning to future astronomical discoveries to understand their validity as well as to everyday situations.
2. Demonstrate an understanding that science is based upon observations of the universe and how that is used to understand some basic phenomenon of our world.
3. Discuss how gravity is related to the formation, interaction, and evolution of the solar system.

Student learning outcomes will be assessed through a combination of assignments submitted each week online. Every question is underwritten by a specific learning objective and a reference to Bloom’s taxonomy. (I doubt most of you will care much about this.)

Course Organization

Lesson 1: Light and Telescopes

Lesson 2: Thinking Like an Astronomer Measuring the Stars

Lesson 3: Evolution of Low-Mass Stars

Lesson 4: Evolution of High-Mass Stars

Lesson 5: Measuring Galaxies

Lesson 6: Our Galaxy: The Milky Way

Lesson 7: The Evolution of the Universe

Lesson 8: Formation of Structure; Life in the Universe

READING ASSIGNMENTS, TESTS, & IMPORTANT DATES

All reading assignments are in text, Understanding Our Universe by Palen, Kay, Smith, Blumenthal. Each week the reading assignments will be posted. Also the corresponding reading from OpenStax Astronomy will be specified.

This is an 8 week course (08/28-10/20). Each “lesson” covers one week of the course. Each week’s work is available Monday morning at 12:01 AM. Each week’s work closes at midnight Sunday. [Even though a holiday may occur during the 8 weeks, the course will be open at 12:01 AM on Monday, and all work is due by Sunday night at midnight.]
<table>
<thead>
<tr>
<th>Week Beginning</th>
<th>Chapters Covered</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 15, 2018</td>
<td>1, 4</td>
<td>• Astronomy Pretest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Discussion Board – Self Introduction and Week 1 Topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Self-Tests, over Ch 1, 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ch 1, 4 Post Tests</td>
</tr>
<tr>
<td>Jan 22, 2018</td>
<td>10</td>
<td>• Discussion Board Week 2 Topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Self-Test, over Ch 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ch 10 Post Test</td>
</tr>
<tr>
<td>Jan 29, 2018</td>
<td>11, 12</td>
<td>• Discussion Board Week 3 Topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Self-Tests Ch 11, 12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ch 11, 12 Post Test</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Research Project #1 Due</strong></td>
</tr>
<tr>
<td>Feb 5, 2018</td>
<td>13</td>
<td>• Discussion Board Week 4 Topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Self-Test, over Ch 13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ch 13 Post-Test</td>
</tr>
<tr>
<td>Feb 12, 2018</td>
<td>14</td>
<td>• Discussion Board Week 5 Topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Self-Tests Ch 14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ch 14 Post Test</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Research Project #2 Due</strong></td>
</tr>
<tr>
<td>Feb 19, 2018</td>
<td>15</td>
<td>• Discussion Board Week 6 Topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Self-Tests Ch 15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ch 15 Post Test</td>
</tr>
<tr>
<td>Feb 26, 2018</td>
<td>16</td>
<td>• Discussion Board Week 7 Topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Self-Test Ch 16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ch 16 PT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Astronomy PT (required before you can access Week 8 work)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Research Project #3 Due</strong></td>
</tr>
<tr>
<td>Mar 5, 2018</td>
<td>17, 18</td>
<td>• Astronomy PT (required before you can access Week 8 work)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Discussion Board Week 8 Topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Self-Test Ch 17, 18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ch 17, 18 PT</td>
</tr>
</tbody>
</table>
Even though there may be "vacation days" during this 8 weeks, all assignments are due as posted. No late submissions are accepted except in DIRE circumstances. Although the 8-weeks term ends officially Mar 9, 2018, I will accept Blackboard quizzes posted up to midnight, Mar 11. Grades will be registered on Mar 12.

Daily (almost) view of the sky posted online at [http://apod.nasa.gov/apod/astropix.html](http://apod.nasa.gov/apod/astropix.html)

Quizzes open on Monday of each week and are available for answering. Quizzes close at midnight on Sunday of each week. In order for a quiz to count it must be answered AND submitted.

Many online courses use a host of multiple choice questions for online testing. In this course you will have different graded assignments each week. First is a Pre-Assessment Quiz to help you judge your understanding of the material. Upon your satisfaction that you understand the material, you will take a Post Test of 10 questions over the week’s study. There is a Discussion Board topic every week. Your thread must be posted by Thursday midnight each week. You must also respond to at least two other students’ threads by midnight, Sunday.

There are three astronomy papers, described in Blackboard. Projects require very little time. They are due at the end of the 3rd, 5th, and 7th weeks.

Extra credit is also available for attending Planetarium shows. An optional final will also be available for extra credit.

This is an 8-weeks course, and things become due awfully fast. NO MAKEUPS unless you can justify (to my satisfaction) dire circumstances, beyond your control. You just have to keep up with the course. Getting a late start for whatever reason is not, in itself, justification for makeup work.

Since this is an ONLINE COURSE, it is really important that you feel part of a group instead of a lone wanderer trying to navigate astronomy. To that end there is a Discussion Board. There are non-graded forums where you may ask questions, and offer suggestions for the course. In week 1 you are to introduce yourself. The forum explains what you are to do. This can be significant in your grade, since you may earn up to 15 points for a useful introduction. For every graded forum to get full credit you must create a thread and post at least two responses to threads created by other students. Threads must be set by Thursday midnight, and responses by midnight, Sunday.

**Grading Policies**

Your grade is determined by the percentage of available points you earn by the end of the 8 weeks. The various assignments are weighted approximately as shown in the table below.
<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percent of Grade</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion Board</td>
<td>15.5%</td>
<td>Weekly (155 total points; 20 x 8)</td>
</tr>
<tr>
<td>Chapter Self Assessment Quiz</td>
<td>16.5%</td>
<td>Weekly for each chapter (165 total points; 11 x 15)</td>
</tr>
<tr>
<td>Chapter Post Tests</td>
<td>50%</td>
<td>Weekly (500 total points)</td>
</tr>
<tr>
<td>Paper 1</td>
<td>6%</td>
<td>End of 3\textsuperscript{rd} week (60 points)</td>
</tr>
<tr>
<td>Paper 2</td>
<td>6%</td>
<td>End of 5\textsuperscript{th} week (60 points)</td>
</tr>
<tr>
<td>Paper 3</td>
<td>6%</td>
<td>End of 7\textsuperscript{th} week (60 points)</td>
</tr>
<tr>
<td>Total Base Points</td>
<td></td>
<td>1000</td>
</tr>
</tbody>
</table>

Total base points is 1000. Actually, with extra credit, it is possible to earn more than 1000 points.

**Grades**

Angelo State University employs a letter grade system. Grades in this course are determined on a percentage scale:

- A = 90 – 100 % (900 or more points).
- B = 80 – 89 % (800—899 points)
- C = 70 – 79 % (700-799 points)
- D = 60 - 69 % (600-699 points)
- F = 59 % and below (below 600 points).

Actually There is a 2% gray area about each grade level. Depending on your overall performance, you may, in my judgment, although having a 78% score, actually deserve a B. There is no guarantee of this happening, but will depend on my view of your overall performance.
Assessment Items

This is an 8-weeks' course, and things become due awfully fast. NO MAKEUPS FOR ANY REASON EXCEPT IN DIRE CIRCUMSTANCES, beyond your control. If such circumstances arise, you must contact me as soon as possible, and we will work out a plan, if warranted. You just have to keep up with the course.

There are extra credit opportunities available, explained below.

**The Pre-Assessment Quizzes** provide a review of the material to be mastered in the lesson. They may be taken as often as you wish (within the week of the course) but only the last grade received will be recorded. The number of questions will vary from 5 to 10. The questions will be multiple choice, true-false, and matching. The last grade received will be the one recorded. They open on Monday morning and close the following Sunday at midnight.

**Discussion Board.** A topic for discussion will be posted each week, available on Monday morning. You must set a thread, responding meaningfully to the topic, by **THURSDAY** midnight. For full credit, you must also comment on at least two threads posted by other students. The deadline for making comments and completing the Discussion Board topic each week is Sunday, midnight.

**Chapter Post Tests** are 10-question multiple-choice tests at the end of each lesson. You may take Post Tests 2 times. The last grade received will be the one recorded. Post Tests open Monday morning each week, and close at midnight the following Sunday.

**Projects.** Three basic research projects are required, one due at the end of week 3, one at the end of week 5, and the last at the end of week 7. These require very little work, but the requirements must be fully met in order to get a satisfactory grade. The projects are explained fully in Blackboard.

**Extra Credit**

Attend Planetarium shows. For each *unique* show you attend (and attendance is verified to me) you may receive 5 course points. The schedule is online. The January calendar is found at [http://www.angelo.edu/dept/physics/planetarium_calendar.php#date/20180101](http://www.angelo.edu/dept/physics/planetarium_calendar.php#date/20180101). The calendar will be fill in as shows are planned. When you sign in you supply your name (legibly), your CID, and for which course you are asking credit. For example, 1303 online. Be sure to indicate you are in an online course, or I won’t get your name.

If you live away from the ASU campus and cannot attend Planetarium shows, contact me. I can arrange for alternative viewing opportunities for you in place of Planetarium shows. If you local address is in the San Angelo area you will probably not be eligible for this alternative.

An optional final exam will be available for extra credit. It will add points, and cannot count against you in any way.

**Final Exam**
This course does not require a final exam as you are evaluated on a weekly basis. However all work must be completed by the dates specified in assignments. However, before you can submit the last quiz (Quiz 8) you MUST take the posttest. Blackboard will not allow you to do Quiz 8 until you have submitted the post test. This test will NOT count as part of your grade unless you score above 75% in which case 2 points will be added to your final average.

Administration

Communication

In this class, we will communicate primarily by writing, mostly in e-mail. In any form of communication, you are expected to treat your fellow students and your instructor with courtesy and respect. In this class, the following rules of etiquette apply:

- Spelling and grammar count. Don’t use slang terms or shorthand "text-speak" abbreviations.
- It’s okay to disagree, but it’s not okay to insult. Flame-wars and ad-hominem attacks are not acceptable.
- No profanity. Offensive language will not be tolerated.
- No racial, ethnic, or cultural slurs. This may result in your removal from the class.

Feedback

As the instructor of this course, it is my goal to respond to all communication within one working day. At a minimum, you can expect me to be actively engaged in this course during the stated office hours, and will strive to be responsive at other times as well. In addition, I will do my best to grade all writing assignments and provide feedback within 2 days of the due date for the assignment.

Attendance

This is an online course and attendance is not taken. However, failure to communicate or respond to e-mails from the professor, is an indication something is wrong. I will note when open Blackboard. If I see you are not keeping up-to-date viewing of Blackboard, it will be my responsibility to inform your advisor.

Late Work

You must contact your professor before the assignment is due if you believe it will be late. In general it will not be possible to do a posted assignment late. No make ups of any kind are allowed after the fact except in dire circumstances. Don’t ask.

Incompletes

The University policy on grades of "Incomplete" is that the deficiency in performance must be addressed satisfactorily by the end of the next long (16 week) semester or the grade automatically becomes a "F". Grades of "Incomplete" will only be awarded to students who have demonstrated sufficient progress to earn the opportunity to complete the course outside of the normal course duration. The award of an
"Incomplete" will only be made in rare circumstances, with the concurrence of the student and the professor on what specific tasks remain and when they are due for the grade to be changed to a higher grade. The determination of the need to award an "Incomplete" is entirely up to the professor's personal judgment.

Add/Drop dates

Students may add or drop this course within the dates assigned by Angelo State University. For exact dates see the Academic Calendar for ASU

See: [http://www.angelo.edu/services/registrars_office/academic_calendar.ph](http://www.angelo.edu/services/registrars_office/academic_calendar.ph)

University Policies

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 Disability

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 at (325) 942-2191 or (325) 942-2126 (TDD/FAX) or by e-mail at Student.Life@angelo.edu to begin the process. The Student Life Office will establish the particular documentation requirements necessary for the various types of disabilities.

Student absence for 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 is absent from classes 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.