Astronomy 115-01: Introduction to Astronomy

Spring 2015

Instructor: Polin Yadak

Email: poliny@sfsu.edu (Please include Astro 115 in your subject line)

Office: SCI386

Class Meets: MWF, 9:10 – 10:00 am in Science 210

Office hours: MW, 10:10 – 11:00 am

Required Materials:

- The Essential Cosmic Perspective 7th edition, by Bennett Donahue, Schneider, and Voit
  You can use the 6th edition of the Essential Cosmic Perspective book if you choose.
- You also need to purchase access to Mastering Astronomy, the online homework system we will
  be using this semester. To login, you will need a reliable internet connection:
  a- Go to www.pearsonmasterin.com
  b- Under register, click the “students” button. If you purchased an access card bundled
    with your textbook, enter the code in the card. If you bought a used book or a book that
    did not come with an access card, you can also purchase access directly from the
    registration page.
  c- To join the course, you will need to enter your SFSU student ID number and the
    course ID: yadak23603

Course objectives:

This class is an overview of astronomy for non-science majors. We will cover most of the material in the
Bennett textbook, following roughly the same order of topics. We will use some basic algebra to solve
problems, and a calculator (not a cell phone) is allowed on all exams.

Important dates:

2/6/15  Last day to drop without a W
2/20/15  Last day to add by exception
2/25/15  First midterm
3/20/15  Last day to select CR/NC grading option
3/23 – 3/27  Spring Break
3/31/15  Cesar Chavez Day
4/1/15  Second midterm
4/24/15  Last day to withdraw with a W*
4/29/15  Third midterm
5/15/15  Last class meeting
5/20/15  Final exam Wednesday 8:00 -10:30 am

**Student Learning Outcomes:**

After a successfully completing this course, students will be able to:

1. Explain the steps in the scientific method of inquiry, which involves gathering observable, empirical and measurable evidence subject to specific principles of reasoning, and recognizing that reproducible observation of a result is necessary for a theory to be accepted as valid by the scientific community.
2. Analyze specific examples of how the scientific method has been used in the past to collect data through observation and experimentation, and to formulate, test and reformulate hypotheses about the physical universe; evaluate scientific information from a variety of sources and use that information to articulate well-reasoned responses to scientific concerns.
3. Evaluate scientific information from a variety of sources and use that information to articulate well-reasoned responses to scientific concerns.
4. Recognize the utility of alternative scientific hypotheses in the development of scientific theories, research and application and understand how scientific evidence is used to develop hypotheses and theories.
5. Describe ethical dilemmas arising out of contemporary scientific research and applications, which may include those related to social justice, and may have implications for local and/or global communities.
6. Use scientific theories to explain phenomena observed in laboratory or field settings.
7. Discuss the relevance of major scientific theories and research to their lives.

**Course Structure:**

Your grade will be determined based on your performance on homework assignments, and exams as described below in the grade policy.

**Homework (35%):** We will have homework assignments (about 1 per week) throughout the semester, and homework will contribute 35% of your overall grade. This will contain thought questions designed to help you synthesize information from the readings and lectures, and a few math-based problems. Every homework assignment has a firm due date, and homework submitted in late will be marked down 10% per day. Homework more than 10 days late will receive no credit. All problems sets must be done using the Mastering Astronomy system.

**Midterm Exams (40%):** There will be three in-class exams during the semester, each covering about one-third of the material. The lowest of these three exam scores will be dropped, and the remaining two exams will each be worth 20% of your overall grade.

**Final Exam (25%):** There will be one cumulative final exam during finals week worth 25%, covering material from the entire semester (note that the final exam cannot be dropped, only one of the midterms).

All exams will be closed book and closed notes, and primarily multiple-choice questions. You will need a #2 pencil and an 882-E Scantron form for each exam, and you are allowed a calculator (NOT A CELL PHONE). Exam dates are listed above in the Important Dates section, please take note and arrive on time. The final exam date is set by the University and is inflexible. **There will be no make-up exams as I will drop one of your lowest score exam.**
Wait List:

I am maintaining a waiting list. The list begins with the official university list. Other students who would like to enroll in the course may state in the questionnaire on the first day of the class. All the students who are interested in adding to the course must sign in everyday. Priority will be given to students who attend lectures and complete homeworks. Students who miss any classes or homework during the first two weeks will be dropped from the class and replaced with those on the waiting list.

Grading Policy:

Grades are based on a combination of homework assignments, and exams with the weights shown below (assuming no curve).

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Score Range</th>
<th>Grade Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>35%</td>
<td>90 – 100%</td>
<td>A- to A</td>
</tr>
<tr>
<td>Midterms</td>
<td>40% (2x20)</td>
<td>75 – 89.99%</td>
<td>B- to B+</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
<td>60 – 74.99%</td>
<td>C- to C+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45 – 59.99%</td>
<td>D- to D+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Below 44.99%</td>
<td>F</td>
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</tbody>
</table>

Useful Contact:

- General computer problems: SFSU helpdesk, 338-1420 or helpdesk@sfsu.edu
- If you have technical issues with the online homework system, go to the following page http://www.masteringsupport.com/MasteringAstronomy/student/topfaqs.htm
- Tutoring and help sessions: http://www.sfsu.edu/~lac/astronomy.html

Academic Integrity:

SFSU maintains a firm policy on plagiarism and cheating, which can be found in the SFSU Bulletin. The Physics and Astronomy department also maintains a set of guidelines stating specific practices that are prohibited and the procedures for handling cases of academic cheating or plagiarism. This policy can be viewed online at: http://www.physics.sfsu.edu/policy/plagiarism.pdf

Disability Policy:

Student with disabilities who need reasonable accommodations are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY 415-338-2472) or by email (dprc@sfsu.edu).

Help Sessions:  (All help sessions are in TH 411)

Mondays 9:00 am – 1:00 pm
Tuesdays 9:00 am – 10:00 am
Thursdays 9:00 am – 10:00 am and 12:00 – 2:00 pm
Fridays 12:00 – 1:00 pm and 4:00 – 5:00 pm
<table>
<thead>
<tr>
<th>Week #</th>
<th>Dates</th>
<th>Notes</th>
<th>Reading</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan. 26, 28, 30</td>
<td>HW 0* due on Monday 2/2</td>
<td>Ch. 1</td>
<td>Modern view of the universe</td>
</tr>
<tr>
<td>2</td>
<td>Feb. 2, 4, 6</td>
<td>HW 1 due</td>
<td>Ch. 2</td>
<td>Night Sky, Seasons, Moon Phases</td>
</tr>
<tr>
<td>3</td>
<td>Feb. 9, 11, 13</td>
<td>HW 2 due</td>
<td>Ch. 3</td>
<td>History of Astronomy, Kepler’s Laws</td>
</tr>
<tr>
<td>4</td>
<td>Feb. 16, 18, 20</td>
<td>HW 3 due</td>
<td>Ch. 4</td>
<td>Motion, Newton’s Laws, Gravity</td>
</tr>
<tr>
<td>5</td>
<td>Feb. 23, 25, 27</td>
<td>Exam 1 (ch. 1-3)</td>
<td>Ch. 5</td>
<td>Light, Spectra, Doppler shift</td>
</tr>
<tr>
<td>6</td>
<td>Mar. 2, 4, 6</td>
<td>HW 5 due</td>
<td>Ch. 5, 6</td>
<td>Telescopes, The Solar System</td>
</tr>
<tr>
<td>7</td>
<td>Mar. 9, 11, 13</td>
<td>HW 6 due</td>
<td>Ch. 6</td>
<td>The Solar System and The Sun</td>
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<tr>
<td>8</td>
<td>Mar. 16, 18, 20</td>
<td>HW 7 due</td>
<td>Ch. 11</td>
<td>Fusion in the Sun</td>
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<td><strong>Mar. 23, 25, 27</strong></td>
<td><strong>Spring Break</strong></td>
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<tr>
<td>9</td>
<td>Mar. 30, Apr. 1, 3</td>
<td>Exam 2 (ch. 4, 5, 6)</td>
<td>Ch. 12</td>
<td>Parallax and Distances, Magnitudes</td>
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<tr>
<td>10</td>
<td>Apr. 6, 8, 10</td>
<td>HW 8 due</td>
<td>Ch. 12</td>
<td>Star Properties, Star Formation</td>
</tr>
<tr>
<td>11</td>
<td>Apr. 13, 15, 17</td>
<td>HW 10 due</td>
<td>Ch. 13</td>
<td>Star Birth, Star Evolution</td>
</tr>
<tr>
<td>12</td>
<td>Apr. 20, 22, 24</td>
<td>HW 11 due</td>
<td>Ch. 14</td>
<td>Neutron Stars, Black Holes</td>
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<tr>
<td>13</td>
<td>Apr. 27, 29, May 1</td>
<td>Exam 3 (ch. 11,12,13)</td>
<td>Ch.15, 16</td>
<td>The Milky Way and other Galaxies</td>
</tr>
<tr>
<td>14</td>
<td>May. 4, 6, 8</td>
<td>HW 12 due</td>
<td>Ch. 18</td>
<td>Dark Matter, Dark Energy</td>
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<tr>
<td>15</td>
<td>May. 11, 13, 15</td>
<td>HW 14 due</td>
<td>Ch. 19</td>
<td>Life in the universe</td>
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<td></td>
<td><strong>May. 20</strong></td>
<td>Final Exam (comprehensive)</td>
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**Note:** Home works are due every week on Fridays at 11:59 pm

*HW 0 is just an introductory on Mastering Astronomy and has no grade.*