San José State University  
College of Science/Physics and Astronomy  
Astro 101, Descriptive Astronomy, Section 1, Spring, 2018

Course and Contact Information

Instructor: Dr. Olenka Hubickyj

Office Location: SCI 310

Telephone: (408) 924 – 5256

Email: olenka.hubickyj@sjlu.edu

Office Hours: MW: 10:30 – 11:30 am  TTh: 2:00 – 3:00 pm or by appt.

Class Days/Time: TTh 10:30 – 11:45 pm

Classroom: SCI 253

Prerequisites: None

GE/SJSU Studies Category: R

Faculty Web Page and MYSJSU Messaging

Copies of the course materials such as the syllabus, lecture power points, and major assignment handouts, etc. will be found in our course link in Canvas. You are responsible for regularly checking with the messaging system through MYSJSU at http://my.sjsu.edu to learn of any updates.

Course Description

This course is a general introduction to our present understanding of origin and evolution of stars, galaxies and the cosmos. We will spend some time discussing how science is carried out and we will focus on how the scientific method has been used to form our present understanding. We will also review the physical laws that are at work throughout the Universe. Although many facts will be presented, the course objectives will be to understand concepts rather than to memorize facts. We will focus on these topics:

1) Brief historical background, the scientific method, and basic physical laws.
2) Techniques used in modern astronomy, including the use of spectroscopy, telescopes, CCDs, & computers
3) The formation of stars, the formation of the Sun and the Solar System.
4) A brief description of the planets in our solar system and planetary systems around other stars
5) The evolution of the stars.
6) The structure of galaxies and galaxy clusters
7) The formation of the Universe: The Big Bang Theory and describe what observational evidence exists to support the theory
8) Current events in astronomy will be included when the topics are discussed, including details of my own research in planetary science. The news is full of the latest astronomical results, and we will discuss new discoveries as they arise. I encourage you to read the news (the newspaper or online), and bring articles you find interesting!
Course Learning Outcomes (CLO)

During this course:

- Students will learn to distinguish science from pseudo-science;
  1. criticizing a pseudo-scientific proposal and identifying the classes of errors involved;
  2. appraising the claims of causal relationships between sunspot activity and human behavior;
  3. comparing scientific vs. nonscientific arguments, i.e. Big Bang and “Young Earth” Creation.
- Students will demonstrate an understanding of the methods of science;
  1. predicting the properties of stars in various evolutionary stages and then testing those predictions against observations;
  2. making a statistical sampling of stars in the night sky and generalizing those results to estimate the number of stars visible in the whole sky;
  3. discussing the observation and classification of various astronomical objects, e.g., stellar spectra, galaxy morphology, etc.
  4. examining the experimental basis for radiation laws and atomic spectra.
- Students will demonstrate an understanding of the limits of scientific investigation;
  1. discussing the inability to accurately predict solar activity and its implications for manned spaceflight missions;
  2. examining the limitations placed on predictions of advanced stellar evolutionary states by the use of idealized models;
  3. considering the merit in claims regarding the cause of the Big Bang.
- Students will apply a scientific approach to questions about the Universe;
  1. identifying the origins of the chemical elements and using that information to infer when the universe was “ready” for the development of life;
  2. discussing the future of the Sun and Earth in light of stellar evolutionary theory;
  3. combining various independent lines of evidence (stellar evolution models, the Hubble Law, radioactive decay of elements) to reach conclusions about the age of the universe and the beginning of Time.
- Students will appreciate the interrelationship of science and human beings by:
  1. examining the impact of human light pollution on observational astronomy (based on their own observational estimates of the number of stars visible from different locations);
  2. discussing how political pressures impact funding for “abstract” research proposals (e.g., the solar neutrino experiment, SETI (Search for Extraterrestrial Intelligence)).

Required Texts/Readings

Textbook

The required textbook is Understanding Our Universe 2nd edition, by Palen, Kay, Smith, and Blumenthal. This textbook and the included online program, SmartWork, is required. The publisher provides access to a free study help site, StudySpace, which I strongly encourage all students to use regularly. The URL is

wnorton.com/college/astronomy/understanding-our-universe/ for the 1st edition
wwnpag.es/uu2 for the 2nd edition

In order to lower the price of the textbook, the publisher has provided us with a customized text with only the chapters that will be covered in our course. This text can only be purchase at the Spartan Bookstore. There is a copy of this textbook in the Martin Luther King Library on reserve.

Course Requirements and Assignments

Students will be expected to attend the lectures regularly and participate in class discussions. Attendance per se shall not be used as a criterion for grading according to Academic Policy F-69-24, but it is strongly encouraged! Laptops are to be used for note taking, only. It is ill advised to “surf the net”, checking e-mails or instant message during class and texting. Paying attention in class will greatly increase your chances of earning a good grade.

Assignments will consist of online homework using SmartWork, occasional worksheet/handouts, and a semester project, which will be described and assigned in class. This semester project will fulfill the SJSU Studies courses requirement of a
minimum of 3000 words of writing for which you will receive prompt feedback on content and writing proficiency. The semester project will count as one exam.

The online homework is very instructive. We will go over the basics of this software in class within the first week of the semester. Please keep in mind that the homework is 15% of your final grade! The URL to login for SmartWork is: http://smartwork.ww Norton.com/sw/login/index.php

To enroll you will need the class enrollment code:

UNDUNIV212433 (this is case sensitive)

and a student enrollment code which is provided to you after you purchase the software.

Final Examination or Evaluation

The final exam will take place in our usual lecture room (SCI 258) on Wednesday, May 22, 9:45 am – 12:00 pm. The exam will not be a cumulative one but a regular chapter-type exam as we have had all semester long.

Grading Information

Determination of Grades

The final grades will be determined as follows:

Exams and semester project = 85%
Homework = 15%

A: 90 - 100%  A-: 90 - 92%  A: 93 - 96%  A+: 97-100%  (note: for GPA purposes, A=A+)
B: 80 - 89%  B-: 80 - 82%  B: 83 - 86%  B+: 87-89%
C: 70 - 79%  C-: 70 - 72%  C: 73 - 76%  C+: 77-79%
D: 60 - 69%  D-: 60 - 62%  D: 63 - 66%  D+: 67-69%
F: 0 - 59%

There will be plenty of opportunities for extra credit (observational opportunities here on campus, SJSU Astronomy seminars, DeAnza Planetarium Program, Foothill College Astronomy Lecture Series, Evergreen Valley College observing nights, museum visits, etc). These will be announced in class. Attendance per se shall not be used as a criterion for grading according to Academic Policy F-69-24, but I strongly encourage it!

Classroom Protocol

As mentioned previously, class participation and attendance is a benefit to you to be able to do a lot of learning in the moment. Using a laptop or your cell phone to connect with shopping, social activities, and any other link is distracting to other students. Keep in mind that you are paying for getting the information you need to fulfill your college degree requirement. Don’t waste your time and money. Don’t think I don’t notice.

If you are having any problems with the course material please see me. Most of the time I know we can clear up any misunderstanding. I am very happy to help you!!!

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs’ Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics, Readings, Assignments, Deadlines</th>
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<tbody>
<tr>
<td>1</td>
<td>Jan 25</td>
<td>General Introduction to Class/Course Requirements</td>
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<tr>
<td></td>
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<td>Chap 1: General intro to Astronomy</td>
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<td>2</td>
<td>Jan 30, Feb 1</td>
<td>Chap 1: continued</td>
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<td>A little bit of Chap 16 --- general info about The Big Bang</td>
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<td>3</td>
<td>Feb 6, 8</td>
<td>Chap 2: Patterns in the Sky</td>
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<td>4</td>
<td>Feb 13, 15</td>
<td>Chap 2: continued</td>
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<td>5</td>
<td>Feb 20, 22</td>
<td>Chap 3: Laws of Motion</td>
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<td>6</td>
<td>Feb 27, Mar 1</td>
<td>Exam #1: Chap 1 &amp; the little bit of Chap 16 &amp; 2</td>
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<td>Chap 4: Light and Telescopes</td>
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<td>7</td>
<td>Mar 6, 8</td>
<td>Chap 4: continued</td>
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<td>Chap/section 10.2 (the structure of the atom)</td>
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<td>8</td>
<td>Mar 13, 15</td>
<td>Chap 5: The Formation of Stars and Planets</td>
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<td>9</td>
<td>Mar 20, 22</td>
<td>Chap 5: continued</td>
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<td><strong>Exam #2</strong>: (Chapters 3, 4, 10.2)</td>
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<td>10</td>
<td>Mar 27, 29</td>
<td><strong>No Classes – Spring Break</strong></td>
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<td>11</td>
<td>April 3, 5</td>
<td>Chap 11: The Sun</td>
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<td>12</td>
<td>April 10, 12</td>
<td>Chap 10: Measuring Stars</td>
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<td>13</td>
<td>Apr 17, 19</td>
<td>Chap 12: Evolution of Low Mass Stars</td>
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<td><strong>Exam #3</strong>: (Chapters 5 and 11)</td>
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<td>14</td>
<td>Apr 24, 26</td>
<td>Chap 12: continued</td>
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<td>Chap 13: Evolution of High Mass Stars</td>
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<td>15</td>
<td>May 1, 3</td>
<td>Chap 13: continued</td>
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<td>16</td>
<td>May 8, 10</td>
<td>Chap 14/15: Galaxies</td>
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<td>Final Exam</td>
<td>May 16</td>
<td><strong>Final Exam #4</strong>: (Chaps 10, 12, 13, 14):</td>
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<td>Tuesday May 22  9:45 am – 12:00 pm</td>
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