Required Text:


Course Description:

This course will be an introductory astronomy survey course with a strong emphasis in planetary science. There will be overviews of all the major bodies in our solar system, as well as exoplanets, stars, galaxies, origins and evolution of the solar system and the universe, and the possibility of life in the universe. The course will cover significant solar system processes such as impact, tectonics, volcanism, atmospheric processes, effects of the solar wind, as well as the basics of orbital mechanics. Also covered will be the history of exploration of each of the bodies in our solar system. Planetary surfaces, atmospheres, interiors, magnetic fields, and ring systems and their associated origins and processes will be explored. Also, the Sun and its effects on the planets will be addressed. Though not an observational astronomy class *per se*, students will be taught how to and required to make basic observations of the night sky not requiring a telescope, of objects such as planets, the Moon, meteors, satellites, and stars.

Student Learning Objectives/Outcomes:

By the end of the course, students will have developed an appreciation for planets and the universe in general and the major processes at work, allowing them to intelligently enjoy future planetary exploration and telescopic studies of space. By the end of the course, they should have a fairly refined understanding of: our current state of knowledge for all major bodies in the solar system (their origins and current states); important processes in the solar system; and techniques used to study the solar system and deep space. They also should have a basic understanding of exoplanets, stars, galaxies, origin of the universe, and astrobiology.
ASSESSMENT METHODS:

Students will be assessed based on: online participation, a midterm exam, a final exam, simple night sky observations, and short writing assignments.

ACADEMIC INTEGRITY:

Students are advised to refer to the University Catalogue for our policy on Academic Integrity. All forms of cheating or plagiarism are unacceptable.

POLICY ON LATE WORK:

This is not a class that you can do at the end of the semester. Like a "face-to-face" class, assignments are required throughout the semester and the work is due on the dates indicated in the assignment pages. If you have contacted an instructor prior to a due date and received permission to submit work late, you may have one week after the due date to send it in without penalty. After that, late assignments are not accepted and given a zero grade. College level success depends on your ability to schedule responsibly, and sadly, some students only learn this after being penalized for poor time management. You need to read the schedule below and updates online and plan when you will begin assignments in order to complete them correctly. It is highly advised that you begin your upcoming week by reading the Assignment page for that week on the previous weekend.

REQUIREMENTS:

1. COMPLETING ASSIGNMENTS: Students are required to submit work correctly and on time. Online education is student-centered and requires that students take more responsibility for their learning than in usual face-to-face classes. Details on all assignments will be provided early in the class on the online Blackboard system.

2. PARTICIPATION: In order to maintain their active participation for the class, students are expected to view the live or archived TV/web cast broadcasts each week. Students are also expected to log onto the Blackboard web site at least two times a week in order to read announcements, assignments and supplementary materials, and participate in the online discussions.

3. NIGHT SKY OBSERVATIONS: Students will be required to look for objects in the night sky (not requiring a telescope), and report on those observations.

4. WRITING ASSIGNMENTS: There will three short writing assignments.
5. EXAMS: There will be one midterm and one final exam. They will be based primarily on lecture, but also may contain material from readings or online assignments.

GRADE DISTRIBUTION:

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GRADES

A = 90-100
B = 80-89
C = 70-79
D = 60-69
F = 0-59

CLASS INFORMATION AND VIDEO ACCESS

Those enrolled in the class will have Blackboard online accounts to access course information including on assignments and exams. Those not enrolled (as well as those enrolled) can find class information and an archive of class videos at: http://planetary.org/bettsclass

Class videos can also be found at: http://dhtv.csudh.edu/
Weekly Schedule with Reading Assignments:

Reading assignments are from *The Cambridge Guide to the Solar System (Second Edition)*, Kenneth R. Lang, Cambridge University Press, 2011. They are listed in the lecture in which they are assigned, i.e., they are reading assignments for the following week’s lecture.

- **Week 1 (Jan. 24)**
  
  Class Info and Tour of the Solar System
  
  *Reading:* Sec. 1.1 Moving Points of Light

- **Week 2 (Jan. 31)**
  
  Easy Things to Look for in the Night Sky with and without telescopes
  How do we explore planets and space, particularly use of the electromagnetic spectrum?


  *Reading:* Sec. 1.2 Telescopes reveal the hitherto unseen
  Sec. 2.2 Impact Cratering
  Ch. 5 The Moon

- **Week 3 (Feb. 7)**
  
  Telescopes, Eclipses, and The Moon

  *Reading:* Ch. 6 Mercury
  Sec. 3.1 Planetary atmospheres fundamentals
  Sec. 3.2 Atmospheres of the terrestrial planets
  Ch. 7 Venus

- **Week 4 (Feb. 14)**
  
  Moon; Mercury; Venus, Earth, Mars intercomparison particularly atmospheres, including habitable zones, the greenhouse effect, the carbon cycle

  *Reading:* Ch. 8 Mars

- **Week 5 (Feb. 21)**
  
  Venus; Mars

  *Reading:* None. Catch up.
• Week 6 (Feb. 28)
  Mars (cont.)
  
  *Reading:*  Ch. 12  Asteroids and Meteorites  
  Ch. 13  Colliding Worlds

• Week 7 (March 7)
  Asteroids and the Asteroid Threat
  
  *Reading:*  Ch. 9  Jupiter  
  Sec. 3.6  Magnetized planets and magnetospheres  
  Ch. 10  Saturn

**Midterm**

• Week 8 (March 14)
  Jupiter system; Saturn system
  
  *Reading:*  Ch. 11  Uranus and Neptune

• Week 9 (March 21)
  Saturn (cont.); Uranian and Neptunian Systems
  
  *Reading:*  Sec. 3.5  The planets are inside the expanding Sun  
  Sec. 3.7  Aurora  
  Ch. 15  Beyond Neptune

• **CSUDH Spring Break (No Broadcast – March 28)**

• Week 10 (April 4)
  Neptune (cont.); Trans Neptunian Objects, including Pluto, KBOs; solar wind, aurorae, heliosphere.
  
  *Reading:*  Ch. 14  Comets

• Week 11 (April 11)
  Outer Solar System (Oort Cloud, light pressure, solar sails, solar effects, Comets); Origin of Solar System; and laws of planetary motion
  
  *Reading:*  Ch. 16  Brave New Worlds

• Week 12 (April 18)
  Exoplanets and Solar System Origin and Formation
  
  *Reading:*  Sec. 1.3  What holds the solar system together  
  Sec. 1.4  Physical properties of the Sun
• Week 13 (April 25)
The Sun and Stars: Formation, evolution, types

Reading: None
• Week 14 (May 2)
Galaxies, Expansion of the Universe, Big Bang, Life and SETI

Final Exam