PHYSICS 195: INTRODUCTION TO PLANETARY SCIENCE AND ASTRONOMY

CALIFORNIA STATE UNIVERSITY DOMINGUEZ HILLS

SYLLABUS FOR SPRING 2014

INSTRUCTOR: DR. BRUCE BETTS

REQUIRED TEXT:

The Cambridge Guide to the Solar System (Second Edition), Kenneth R. Lang, Cambridge University Press, 2011.

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 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. Experts from around the country will join the lecturer via videoconference and phone to describe their research and to take questions. 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 bodies in the solar system (their origins and current states); important processes at work in the solar system; and techniques used to study the solar system and deep space. They also should have a basic understanding of stars, galaxies, the 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 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 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.

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 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:

Participation (5) 15 (3 pts. each)

Night Sky Observations (1) 10

Writing Assignments (3) 15 (5 pts. each)

Exams

Mid Term	30
Final Exam	30
Total	100

GRADES A = 90-100

B = 80-89

C = 70-79

No Credit = 0-69

WEEKLY SCHEDULE:

- Week 1 (Feb. 5)

  Overview Day: Tour of the Solar System, and Easy Things to Look for in the Night Sky with and without telescopes

- Week 2 (Feb. 12)

  How do we explore planets and space? Telescopes, spacecraft, using multiple wavelengths, remote sensing and *In Situ* Studies

- Week 3 (Feb. 19)

  The Moon, Mercury, and Planetary Surfaces Processes

- Week 4 (Feb. 26)

  Venus, Earth, Mars Intercomparison, and Focus on Venus

- Week 5 (March 5)

  Mars

- Week 6 (March 12)

  Asteroids, including Near Earth Objects, and impact hazards to the Earth.

- Week 7 (March 19)

  Jupiter and its satellites, Magnetospheres

Midterm

- Week 8 (March 26)

  Saturnian System, Ring Systems

CSUDH Spring Break (No Broadcast – April 2)

- Week 9 (April 9)

Uranian and Neptunian Systems

- Week 10 (April 16)

Pluto system, Kuiper Belt Objects, Trans Neptunian Objects, Oort cloud, Comets and effects of the Sun (solar wind, light pressure)

- Week 11 (April 23)

Extra Solar Planets: exploring other solar systems, and origins of our own

- Week 12 (April 30)

The Sun and Stars: Formation, evolution, types. Plus solar sails and Lagrange Points.

- Week 13 (May 7)

Galaxies, Expansion of the Universe, Big Bang, Life and SETI

Final Exam