

Astrophysics
Carson High School
Spring Semester 2009

1. **INSTRUCTOR:** Mr. Bean

Office: Room 212

Office Hours: By appointment, before A1/B2, Lunch, or After School

Telephones: 283-1714

Due to special programs, assemblies and meetings, it will be necessary to operate on a different schedule occasionally.

2. **REQUIRED ON-LINE TEXT:**

Astronomy, Stacy Palen, Ph.D.

Astronomy Today, Chaisson and McMillan

3. **REQUIRED ITEMS:** Note Book, scientific calculator, Flash-Drive pencils, eraser, etc

4. **COURSE Goals:** Topics covered in the spring semester range from planetary astronomy to cosmology. The first lectures are a review of most of the physics presented during the 1st semester. This review is necessary to obtain a basic understanding of astronomical phenomena. Astronomical techniques, the solar system, stars, and the distant universe will be presented in a concise but thorough manner. Goal 1 is an understanding of basic astronomical nomenclature, history, and techniques for observation, including telescope operations. Goal 2 is an understanding of planetary motion as described by Kepler (some math). Goal 3 is an understanding of the Sun and its affect on the solar system. Goal 4 is an understanding of stars and their particular life cycles. Finally, goal 4 is an understanding of basic cosmology, including dark matter, parallel universes, and astrobiology.

5. **GRADING:** There are two nine-week "progress" grading periods during the spring semester. Additionally, four-progress reports will be given, one approximately mid-way through each nine-week grading period. The dates of these events will be announced in class:

Your work in Astrophysics will be evaluated in the following manner:

OBJECTIVELY Point values will be awarded for the following:

Chapter Homework Questions-Conceptual (5%). Unexcused late 50% reduction.

Special Projects (20%) may be assigned from time to time. These items include but are not limited to written reports, PowerPoint, in-class activities, etc.

Video Notes/Questions (25%)

Mid-Semester Exam (12%)

Labs/Virtual Lab Reports will be due after laboratory activities. Each lab report will be graded on the basis of format (written up correctly), originality (each student does own work), data (completeness and accuracy), and conclusions (drawing conclusions on the basis of scientific observations). Lab reports will be worth (26%)

Final Exam Part 1, Sloan Sky Digital Survey/Starry Night (6%)

Final Exam Part 2, Multiple Choice-Conceptual (6%)

Total = 100%

Letter grades will be based on the following criteria:

90% of total points = A

80% of total points = B

70% of total points = C

60% of total points = D

Below 60% is too terrible to contemplate!

6. The instructor reserves the right to curve grades at the end of the semester if he feels it is necessary. Grades for individual tests, homework, problem sets and/or labs will not be curved. From time to time extra credit projects may be made available. These projects are optional. They can add significantly to a student's point total and, therefore, should not be ignored.

7. SCHOOL POLICIES: All school policies will be rigidly enforced -- no exceptions! Students must be familiar with and abide by the guidelines in the CHS Student Handbook pertaining to such areas as discipline, attendance, appearance, & academic honesty, etc.

8. EXPECTATIONS: The instructor assumes that you are mature, motivated, and willing to broaden your understanding of the physical world; that you are curious, objective, and interested in new ideas; and above all, that you are ready, willing, and able to work and study every day. This course is demanding; successful completion requires full determination and dedication from beginning to end.

Your work in this course can be likened to the flight of an airplane. If you cruise at altitude (study regularly), the amount of work required is reasonable; if you are constantly landing and taking off (periodically cramming), it requires more fuel and the odds of a crash (failure) increase.

9. TENTATIVE SECOND SEMESTER COURSE OUTLINE: We will be following a unit plan more so than the textbook. The on-line textbook will provide background readings. Please read assigned chapter prior to initial class activities. The instructor assumes that you will have done so. Do so if you expect to understand classroom presentations fully.

Second Semester

Unit 1: Astronomy and the Universe

Ch 1: Foundations of Astronomy
Ch 2: Copernican Revolution
Ch 3: Radiation
Ch 4: Spectroscopy
Ch 5: Telescope

Unit 2: Solar System

Ch 6: The Solar System
Ch 7: Earth
Ch 8: The Moon and Mercury
Ch 9: Venus
Ch 10: Mars
Ch 11: Jupiter
Ch 12: Saturn
Ch 13: Uranus, Neptune, and Pluto
Ch 14: Solar System Debris
Ch 15: Formation of Planetary System

Unit 3: Stars and Stellar Evolution

Ch 16: The Sun
Ch 17: Measuring the Stars
Ch 18: Interstellar Medium
Ch 19: Star Formation
Ch 20: Stellar Evolution
Ch 21: Stellar Explosions
Ch 22: Neutron Stars and Black Holes

Unit 4: Galaxies and Cosmology

Ch 23: The Milky Way
Ch 24: Normal Galaxies
Ch 25: Active Galaxies and Quasars
Ch 26: Cosmology
Ch 27: The Early Universe
Ch 28: Astrobiology
Ch 29: Dark Matter and Parallel Universes

