ASTRON 5 Course Outline as of Spring 2011

CATALOG INFORMATION

Dept and Nbr: ASTRON 5 Title: LAB SOLAR ASTRON
Full Title: Solar Astronomy with Laboratory
Last Reviewed: 3/3/1989

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	4.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	4.00	Lab Scheduled	3.00	6	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	6.00		Contact Total	105.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 210.00

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:
The techniques used to gather basic solar astron-observed properties of the sun, the moon, the planets, the satellites of planets, comets and minor planets. The laboratory includes star charts, diurnal and annual motion, coordinate systems, lunar and solar photography, solar spectroscopy, planetary motions and diameters.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100.

Limits on Enrollment:

Schedule of Classes Information:
Description: Basic methods used to gather information about the sun, moon, planets, satellites & comets. Lab experiences designed to illustrate the gathering & reduction of such information. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 100 or ESL 100.

Limits on Enrollment:
Transfer Credit:
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
	C	Natural Sciences	Spring 1989	Spring 2011
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B1	Physical Science	Fall 1990	Spring 2011
	B3	Laboratory Activity		
IGETC:	**Transfer Area**		Effective:	Inactive:
	5A	Physical Sciences	Fall 1981	Spring 2011
	5C	Fulfills Lab Requirement		

CSU Transfer: Effective: Inactive:

UC Transfer: Effective: Inactive:

CID:

Certificate/Major Applicable:
Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:
Students will:
1. Distinguish among dirunal, annual and precessional motion.
2. Be able to describe the phenomena which lead to the earth's seasons.
3. Describe the differences among the geographical, horizon and equatorial coordinate system.
4. Be able to use star charts to identify particular stars and constellations in the planetarium sky.
5. Be able to distinguish between solar and sidereal time.
6. Be able to predict the phases of the moon.
7. Be able to tell time by the moon.
8. Be able to identify the major lunar seas.
9. Be able to determine the age of a planetary surface from crater counts.
10. Be able to predict eclipses by observations of lunar orbital nodal points.
11. Be able to determine planetary gravitational fields from planetary mass and radius.
12. Be able to use Kepler's 3rd law to determine period of revolution from orbital semi-major axis.
13. Be able to contrast the grass qualitative properties at the major planets.
14. Be able to describe the general properties of the solar magnetic cycle.
15. Be able to describe the nuclear process by which the sun generates

energy.

Topics and Scope:

1. Introduction.
   a. scale of the solar system.
   b. scale of the stellar system.
2. The Celestial Sphere & Diurnal Motion.
   a. celestial equator
   b. celestial poles
   c. diurnal circles
3. Annual Motion.
   a. the ecliptic
   b. seasonal variation of constellations
4. Seasons & Coordinate Systems.
   a. variation of solar intensity.
   b. variation in duration of sunlight.
   c. tropics.
   d. solstices and equinoxes.
   e. geographic coordinate system.
   f. horizon coordinate system.
   g. equator coordinate system.
5. Star Charts and Telescopes.
   a. star charts.
   b. reflecting telescopes.
   c. refracting telescopes.
6. Time and the Calendar.
   a. solar time.
   b. sidereal time.
   c. apparent time.
   d. mean time.
   e. equation time.
7. Aspects of the Moon.
   a. orbit of moon.
   b. phases of moon.
   c. distance of moon.
   d. mass of moon.
   e. diameter of moon.
8. The Space Program.
   a. ranger program.
   b. surveyor program.
   c. orbiter program.
   d. apollo program.
9. The Lunar Surface.
   a. the lunar seas.
   b. the lunar high lands.
   c. the lunar craters.
   d. the lunar mountains.
   e. the rays.
10. Tides and Eclipses.
   a. tides.
   b. solar eclipses.

c. lunar eclipses.
d. frequency of eclipses.

11. History of Astronomy.
    a. Greek astronomy
        1. Aristarchus
        2. Pythagoras
        3. Plato
        4. Aristotle
        5. Hipparchus
        6. Ptolemy
    b. Renaissance astronomy
        1. Copernicus
        2. Galileo
        3. Brahe
        4. Kepler
        5. Newton
12. Mercury and Venus.
    a. mariner 10 mission.
    b. surface features.
13. Mars.
    a. History of observations.
        1. Sciaparelli's "Canali"
        2. Lowell's "Canals"
        3. Well's "Martians"
    b. flights of mariners 5,6,7,8,9 and vikings 1 and 2.
    c. surface features.
    d. satellites.
14. Jupiter and Saturn.
    a. earth based observations.
    b. voyager 2.
    c. satellites.
    d. rings.
15. Uranus, Neptune, Pluto.
    a. earth based observations.
    b. voyager 2.
    c. satellites.
    d. rings.
16. Minor Members of the Solar System.
    a. minor planets.
    b. comets.
    c. meteoroides, meteors, meteorites.
17. The Sun.
    a. the photosphere. 1-sunspots, 2-the sunspot cycle
    b. the chormosphere (solar flares)
    c. the corona
    d. the solar wind.
    e. the solar core. 1-hydrogen fusion, 2-the destiny of the sun
18. The Origin of the Solar System.
    a. duelistic theories
    b. monistic theories

Assignment:

1. To use star charts to determine the equatorial coordinates of a set of stars.
2. Given a set of equatorial coordinates, to determine the stars indicated.
3. To use star charts to locate particular stars and constellations in the planetarium sky.
4. To determine the sidereal and solar times from particular setting of the planetarium sky.
5. To determine the age of the lunar surface from crater counts.
6. To determine the time of day from particular settings of the plantarium moon.
7. To determine surface gravities of the moon and planets from given values of mass and radius.
8. To observationally map the lunar surface.
9. To predict eclipse times at various locations on the earth's surface.
10. To construct an eclipse.
11. To use Kepler's 3rd law to predict planetary revolution periods.
12. To predict times of retrograde motion for superior planets.
13. To determine the age of the mercurian and martian surface from crater counts.
14. To determine the time of the next sunspot maximum.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Reading reports	Writing 10 - 30%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Lab reports, Exams	Problem solving 10 - 40%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None	Skill Demonstrations 0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, True/false	Exams 25 - 50%

Other: Includes any assessment tools that do not logically fit into the above categories.

None

Other Category
0 - 0%

Representative Textbooks and Materials: