

ASTRONOMY 20

THE SOLAR SYSTEM
or
There's No Place Like Home

FALL 2009

COURSE INFORMATION SHEET

Instructor: S. Vincent Lloyd

email: svlloyd@elcamino.edu

Phone extension: 3246

website: www.sabik.org

Office hours: Monday 2:00-3:00 pm,
Tuesday 2:00-2:30 pm
Wednesday 2:00-3:00 pm,
Thursday 2:00-3:00 pm,
Friday 2:00-3:30 pm.

Office location: Physics 117A, due north of the Humanities Building.

Tutor: Library 2nd floor, hours to be announced.

Dates: Mondays & Wednesdays, Aug. 31 – Dec. 16.

Holidays: Monday, Sept. 7 (Labor Day).

Course Description

Greetings, Earthlings! You are about to embark on a journey to our neighbor worlds in the cosmos! Astronomy 20 is an introductory-level course which concentrates on the foundation of modern astronomy and the study of the major worlds of the Solar System. The course has no astronomy, physics, or math prerequisites; however, knowledge of basic high school algebra is sometimes helpful.

Credit for the 3 units of Astronomy 20 is fully transferable to the California State University system. Credit is fully transferable to the U.C. system unless you also take Astronomy 25 (see a counselor if you have taken Astro 25 and are planning to transfer to a U.C.).

Course Objectives

The objective of Astronomy 20 is to give you an insight into what makes the Earth a special place for life. During the course, the student will learn how to:

1. Explain the difference between science and “pseudo-science.”
2. Diagram the positions of the Sun, the Earth, and the Moon during solar and lunar eclipses.
3. Predict the phase of the Moon that would be seen in the sky, given the positions of the Earth, the Sun, the Moon, and the observer.
4. Explain the causes of seasonal variations in the length of the day, the direction of sunrise and sunset, and the amount of solar heating.
5. Explain how light heats planets and how they cool. Discuss the impact of the greenhouse effect on the Earth.
6. Compare the characteristics of the major planets and moons.
7. Construct a history of a planet in terms of the processes of impact, volcanism, tectonics, and erosion.
8. Evaluate the possibilities for life on a given planet.
9. Sketch how the planets were formed.
10. Explain how the force of gravity affects the motion of falling bodies, satellites, and planets.

Student Learning Objectives

By the end of the course, the student will be able to:

1. Determine whether a certain method is scientific or pseudo-scientific.
2. Diagram the path of the Sun in the sky, given the date.
3. Given the phase of the Moon, point to the Moon.
4. Predict what will happen to the climate if greenhouse gasses are added to the atmosphere.
5. Diagram the path a spacecraft will take to get to another planet.

Required textbooks

Cosmic Perspective by Bennett et al.

Lecture Tutorials for Introductory Astronomy by Adams, Prather, and Slater.

Lloyd's Astronomy Reader by S. V. Lloyd

Additional materials: 5 Scantron No. 888 forms.

Library

Cosmic Perspective is on reserve in the library. For library hours, see www.elcamino.edu/library/

Attendance and Withdrawal

Attendance is encouraged but not mandatory. Keep in mind that coming to class *by itself* will *not* earn you a passing grade, while *not* coming to class makes it exceedingly difficult to pass the course. If you do miss a class, it is up to you to ask other students what you missed.

You *may* be dropped from the class if you miss 3 classes in a row without notifying the instructor, but you will not be automatically dropped. If you decide *not* to complete the course, it is *your* responsibility to drop the course on-line or at the admissions office (if it is before the last day to drop). Otherwise, you may end up with an "F" for this course on your transcript.

Important dates

Last day to drop and get a refund:

Friday, Sept. 11

Last day to drop without a "W"

Friday, Sept. 25

Last day to drop *with* a "W"

Friday, Nov. 20

A "W" (withdrawal) means that you attempted the course but did not complete it. If you stop attending after the "W" date you will receive an "F" for the course.

Grading

You will be graded on the following:

Oral Report. With a partner, you will make a 2-minute report to the class about a small member of the solar system: an asteroid, a moon, a comet, or a KBO. This is a 2-person report; you must have a partner. First you will prepare an outline and bring it to the instructor during office hour. Then your talk will be put on the schedule. Your outline will include:

I. **Introduction.** Explain why your object is interesting.

II **Body.** Here's where you tell where it is, how big it is, etc.

III **Conclusion.** Explain why your object is important. What does this object tell us about the Solar System?

The use of notes is not allowed during the talk. 50 points (10% of your course grade).

Projects. There will be two homework projects involving observation of the Sun and the Moon. Details will be discussed later. Each project is worth 50 points.

Homework. There will be 5 short homework assignments, 10 points each.

Tests. There will be 4 tests worth 100 points each (20% of your course grade). The tests will be on the following Wednesdays: **Sept. 23, Oct. 21, Nov. 18, and Dec. 16.** Bring a Scantron No. **888** for each test. During the test, you are allowed to use notes written on **one** 3x5 file card, written in your own hand.

The lowest test score will be dropped, so there is no penalty for missing one test.

If an emergency causes you to miss a second test, you may, at the instructor's discretion, be allowed to take an oral make-up exam. No make-up exams will be given the last week of the semester.

You will be given study guides that will detail what material you are responsible for on the tests. If you can answer all the questions on the study guide, you should do well on the test.

If you have a disability that affects your ability to take tests, contact the Special Resource Center well ahead of the test date to discuss special test-taking arrangements.

Extra credit and bonus credit.

Observatory Evening. You can get 25 points extra credit by coming to an Observatory Evening at the **ECC Observatory**. If you cannot attend one of the ECC events, you may instead go to one of the following science museums: the California Science Center (Exposition Park), Natural History Museum (Exposition Park), Santa Monica College (Friday evening only), or Tessman Planetarium (Santa Ana College). *Limit:* one visit for 25 points.

Griffith Observatory: You may visit the Griffith Observatory for an additional 25 points. Website: www.griffithobs.org. Closed Mondays. *Limit:* one visit for 25 points.

Rules for both Open House and Griffith Observatory:

- 1) Make your visit on or before **November 30**.
- 2) Write a 1-page report and explain 10 things you learned. Tell what you learned, not what you learned *about*. Example: *I learned that Venus looks like a crescent moon in the telescope.*
- 3) Attach proof of attendance with a date on it. (For Griffith Observatory, ask for a proof of attendance from the staff or attach a planetarium ticket. Or buy something.)
- 4) Turn your report in within **10 days** of your visit. No exceptions.

Grading Scale

<u>Grade points</u>		<u>Grading scale</u>		
Homework	50	90% and up:	A	450+
Oral report	50	75% - 89%:	B	375+
2 Projects	100	60% - 74%:	C	300+
3 of 4 tests	300	50% - 59%:	D	250+
Total	500	49% and down:	F	<250

Grading Policy

See www.elcamino.edu/admissions/grading.asp

Class Policies

Food and drink. Do not bring drinks other than water into the Planetarium.

Manners. Treat other students and the instructor with respect and courtesy. Do not talk while another student or the instructor is speaking.

Time deadlines. Assignments are considered late if they are given to the instructor after the day they are due. An assignment has to be handed to the instructor during class or office hour or slipped under his office door. Do not drop off assignments in the division office. Emailed assignments are not accepted. Late assignments may or may not be given partial credit at the instructor's discretion.

Incompletes in the course. An "incomplete" grade will not be given unless the student is prevented from finishing the course on time because of an extraordinary, unexpected circumstance. Students receiving an incomplete must be doing passing work up to that point. If such an occurrence happens, it is the student's responsibility to contact the instructor immediately to explain the situation and make arrangements to complete the course.

Students with disabilities. El Camino College has a tradition of providing access to education for students with disabilities. For further information, see the El Camino Catalog, Special Resource Center. Students with disabilities should inform the instructor especially if there are medical problems or learning disabilities. Accommodations may be provided as recommended by the Special Resource Center. See www.elcamino.edu/academics/src/

Academic integrity

The follow acts are considered dishonest and are not allowed:

On *homework assignments*, copying someone else's work, fabricating data, or reporting that you saw something that you didn't see. Copying someone else's homework is against the rules in the United States. So is letting someone else copy your work.

On *tests*, copying from another student's answer sheet or using notes other than those allowed by the instructor. Letting someone else copy your answers is also unethical.

Students who do any of these actions are subject to disciplinary action.

See El Camino College Catalog, Standards of Student Conduct.

Calendar of events on campus

See www.elcamino.edu/uportal/calendar/select_cal.aspx

<u>Grade record</u>	Points	Possible	Cumulative Points	Cumulative Possible
Test 1	_____	100	_____	100
Test 2	_____	100	_____	200
Project 1	_____	50	_____	250
Test 3	_____	100	_____	350
Test 4	_____	100	_____	450
<i>Subtract</i> lowest test	_____	100	_____	350
Project 2	_____	50	_____	400
Homework	_____	50	_____	450
Oral Report	_____	50	_____	500
Extra credit	_____	50	_____	500

Topic Outline

#	Date	Topic
1	8/31	Orientation
2	9/2	Bad Astronomy
3	9/7	Labor Day Holiday–no class
4	9/9	The Universe in space and time
5	9/14	The Celestial Sphere
6	9/16	Daily Motion of the Sky
7	9/21	Annual Motion of the Sun
8	9/23	Test 1
9	9/28	Motions of the Planets
10	9/30	Copernicus
11	10/5	Galileo
12	10/7	Kepler's Laws
13	10/12	Law of Inertia, Acceleration due to gravity
14	10/14	Orbital Motion, Law of Gravity
15	10/19	The Scientific Method
16	10/21	Test 2
17	10/26	The Seasons
18	10/27	Origin of the Solar System
19	11/2	The Terrestrial Planets
20	11/4	The Moon
21	11/9	Mercury, the Tidal Force
22	11/11	Atmospheres, Greenhouse Effect
23	11/16	Mars
24	11/18	Test 3
25	11/23	Venus
26	11/25	Earth
27	11/30	Eclipses
28	12/2	Jupiter and Saturn
29	12/7	Uranus and Neptune
30	12/9	Moon Phases
31	12/14	Ice moons of the outer solar system
32	12/16	Test 4