



Astronomy 101

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COURSE TITLE: AST 101, Astronomy I

Prerequisite(s): MAT 102* with a minimum grade of "C."

COURSE DESCRIPTION:

This course is a descriptive survey of the universe with emphasis on basic physical concepts and the objects in the solar system. Related topics of current interest are included.

General Education Outcomes

Students who complete the general education core curriculum should be able to demonstrate

1. rationality, logic, and coherence, through critical thinking;
2. their ability to express themselves effectively in written and oral communication;
3. their ability to express themselves effectively in quantitative and qualitative terms;
4. their knowledge of the value and significance of diverse cultures;
5. the scientific method of inquiry;
6. their knowledge of global, political, social, economic, and historical perspectives; and
7. their ability to access, retrieve, synthesize, and evaluate information.

Course Outcomes

After completion of this course, students will

1. Complete the course successfully in order to continue on with this sequence and/or transfer to a university and continue on with the study of astronomy or related coursework.
2. Demonstrate knowledge of the vocabulary necessary in order to read and analyze articles in newspapers and magazines concerning astronomy.
3. Contrast and compare the planets and moons in our solar system with each other.
4. Describe comets, asteroids, and meteorites and theories of formation of our solar system and others.
5. Discuss and comment on life in our solar system and possibly elsewhere.

CREDITS/CONTACT HOURS: 4 credit hour

Textbook: Jeffrey O. Bennett, Megan Donahue, Nicholas Schneider, and Mark Voit, [Essential Cosmic Perspective Media Update](#), 6th edition, [Addison-Wesley](#). 2012



- Jeffrey O. Bennett, Megan Donahue, Nicholas Schneider, and Mark Voit, [Cosmic Perspective](#), 6th edition, [Addison-Wesley](#). 2011
- Eric Chaisson and Steve McMillan, [Astronomy Today](#), 6th edition, [Addison-Wesley](#). 2008
- Roger Freedman and William J. Kaufmann, [Universe](#), 8th edition, [W. H. Freeman](#), 2008
- Eric Chaisson and Steve McMillan, [Astronomy: A Beginner's Guide to the Universe](#), 5th edition, [Addison-Wesley](#). 2008
- John Fix, [Astronomy: Journey to the Cosmic Frontier](#), 5th edition, [McGraw-Hill](#), 2008

Recommended tools: Scientific, graphic calculator (TI series)
Star and Planet finder
Voyager: SkyGazer College Edition v3.7 CD-ROM, 4/E

Method of Instruction: The class will be taught by lecture and class participation in problem sessions and laboratories.

Grading System:

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

Methods of Evaluation for Student Performance:

- Weekly problems assigned as homework
- Written quizzes and tests (including a comprehensive final examination)
- In class exercise/practice and/or activities
- Term papers and oral presentation
- Lab reports for each lab

Grade Calculation Method:

There will be midterm and final tests given during the semester. A comprehensive examination will be available. The course grade percentage from midterm tests and final test is weighted by individual instructor.

Attendance Policy:

Students are responsible for punctual and regular attendance in all classes, laboratories, field trips, and other class activities. The college does not grant excused absences; therefore, students are urged to reserve their absences for emergencies. When illness or other emergencies occur, the student is responsible for notifying instructors and completing work missed.

Except in extenuating circumstances with approval by the division dean, instructors withdraw students from class when 80 percent attendance is not maintained. **Some courses have more restrictive attendance policies as indicated in course syllabus.** If a student exceeds the allowable attendance, the instructor will withdraw the student and award a grade of "W" or "WF" based upon the student's academic standing at the last date of attendance.

Students are tardy if not in class at the time the class is scheduled to begin. Tardy students are admitted to class at the discretion of the instructor. **Course syllabi reflect attendance policies related to tardiness.**

Withdrawal Policy: During the first 75% of the course, a student may initiate withdrawal and receive a grade of 'W'. A student cannot initiate withdrawal during the last 25% of the course. Extending circumstances require documentation and approval by the appropriate department head and academic dean.

Absences for Religious Holidays: Students who are absent from class in order to observe religious holidays are responsible for the content of any activities missed and for the completion of assignments occurring during the period of absence. Students who anticipate their observance of religious holidays will cause them to be absent from class and do not wish such absences to penalize their status in class should adhere to the following guidelines:

1. Observance of religious holidays resulting in three or fewer consecutive absences: Discuss the situation with the instructor and provide written notice at least one week prior to the absence(s). Develop (in writing) an instructor-approved plan which outlines the make up of activities and assignments.

Observances of religious holidays resulting in four or more consecutive absences: Discuss the situation with the instructor and provide the instructor with written notice within the first 10 days of the academic term. Develop an instructor-approved plan which outlines the make up of activities and assignments.

Classroom Conduct:

ACADEMIC DISHONESTY: Students are expected to uphold the integrity of the College's standard of conduct, specifically in regards to academic honesty. All forms of academic dishonesty including, but not limited to, cheating on assignments/tests, plagiarism, collusion, and falsification of information will call for disciplinary action. Disciplinary action imposed may include one or more of the following: written reprimand, loss of credit for assignment/test, termination from course, and probation, suspension, or expulsion from the College. For further explanation of this and other conduct codes, please refer to the Student Handbook.

CELLULAR PHONES AND PAGERS/BEEPERS: Cellular phones, pagers and beepers are not permitted to be turned on or used within the classroom. Use of these devices during classroom time will be considered a violation of the student code as it relates to "disruptive behavior."

Class/Lab Procedures:

The class is taught primarily by lecture. Questions from students are both expected and encouraged. Student participation is expected in problem sessions and laboratories. Problem sessions and laboratories are generally done in small groups.

Accommodations:

Students who need special accommodations in this class because of a documented disability should notify Student Disability Services by calling (864) 592-4818, toll-free 1-800-922-3679; via email through the SCC web site at www.sccsc.edu/resources/disabilities; or by visiting the office located in the East Building Room 30-B on the SCC Central campus. Contacting Student Disability Services early in the semester gives the College an opportunity to provide necessary support services and appropriate accommodations.

Course Outcomes & Objectives:

The overall objectives of this course are that the learner will:

- Gain an understanding of the nature of science and astronomy
- Gain an appreciation for the size, scale, and structure of the cosmos
- See that the universe is comprehensible through the scientific principles that can be understood by everyone
- Gain an increased interest in studying current events in astronomy as a life-long learning activity
- Be able to describe the characteristics of objects within the solar system including the sun, planets, moons, asteroids, and comets.

Upon satisfactory completion of this course, the student will be able to:

A. Observing the Universe Through the Sky Around Us

- Use celestial coordinates for positions of objects in the sky.
- Recognize constellations in the sky.
- Compare the motions of the Sun, Moon, planets, and stars in our sky.
- Explain how seasons on Earth are determined.
- Recognize the various phases of the moon.
- Explain the conditions necessary for a lunar eclipse and a solar eclipse.

B. History of Astronomy

- Give examples of ancient astronomical observatories.
- Contrast the geocentric and the heliocentric views of the universe.
- Summarize the contributions made to astronomy by Copernicus, Brahe, Kepler, Galileo, and Newton in the 16th, 17th, and 18th centuries.
- Describe Kepler's Three Laws of Planetary Motion.
- Identify the main characteristics of the elliptical motion of planets.
- Describe the effects of Galileo's telescopic observations on the existing view of the Universe.
- Describe the Law of Gravity

C. The Solar System

- Name the various types of celestial bodies in our solar system.
- Distinguish between terrestrial and Jovian planets.
- Identify the major spacecraft involved in the exploration of each planet.
- Explain the causes of tides on Earth.
- Compare the orbital properties and the physical properties of the Moon and Mercury.
- Differentiate between the formation processes of craters and of seas on the Moon.
- Explain the more acceptable theory of the origin of our moon.
- List the distinguishing features of each of the planets.
- Summarize the discoveries of the planets Uranus, Neptune, and Pluto.
- Compare the satellite systems of each planet.
- Describe the various types of asteroids in our solar system.
- Explain what a comet is, and compare its orbital motion to that of the planets.
- Differentiate between meteors, meteorites, and meteoroids.

Course Content Outline:

The following is an outline of the material covered during the course. The study of nearly every topic involves the critical evaluation of the pertinent theories and concepts as well as the critical evaluation of data in sample problems concerning each of the following topics.

Part 1: Developing Perspective

Chapter 1: Our Place in the Universe

Chapter 2: Discovering the Universe for

Yourself

Chapter 3: The Science of Astronomy

Part 2: Key Concepts for Astronomy

Chapter 4: Making Sense of the Universe:
Understanding Motion, Energy, and Gravity
Chapter 5: Light: The Cosmic Messenger
Part 3: Learning from Other Worlds
Chapter 6: Formation of Planetary Systems:
Our Solar System and Beyond

Chapter 7: Earth and the Terrestrial Worlds
Chapter 8: Jovian Planet System
Chapter 9: Asteroids, Comets, and Dwarf
Planets: Their Nature, Orbits, and Impacts