Course Information Form (CIF)

Course Code: AST 101 (IAI P1 906L)

Course Title: The Solar System

Department: Natural Sciences
PCS Code: 1.1 - Baccalaureate/Transfer
CIP Code: 40.0201
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 3-2-4
Credit Hour Distribution:

Lecture: 3	Lab: 2	Clinical: 0	**Total: 4**

General Course Information

Catalog Description

Historical ideas concerning stars and planets; structure and motions of Earth, planets, and moons; physical nature of the Sun, planets, comets, asteroids, and meteors; origin and evolution of the Solar System. Includes an evening telescope observation.

General Course Objectives

To enable the student to learn to: Describe planet properties and compare Earth to other planets.
Apply the scientific method to evaluate new ideas.
Identify basic navigational markers, constellations, and asterisms in the night sky.
Identify and describe the basic instrumentation and techniques astronomers use to study astronomical objects.
Navigate the night sky in person.

Minimum Placement Levels

English	Reading	Math
Placement out of ENG 099	Placement out of CCS 098	None

Prerequisites

None

Methods of Evaluation

5-12 objective quizzes, 1 cumulative final exam, 13-14 laboratory exercises, 1 semester project (observations, quantitative analysis, project report), 1 observation report, and 1-2 sky quizzes. Online class replaces sky quizzes with class discussion board participation.

Instructional Materials and Additional Supplies

Astronomy, Second Edition. Published by OpenStax; last updated 2024 July 8; print edition also offered. 978-1-951693-50-3. On-campus students purchase a lab packet ($6).

Course Content

General Learning Outcomes (GLOs)

- Critical Thinking and Information Literacy: Students will demonstrate the ability to evaluate perspectives, evidence, and implications, and to locate, assess, and use information effectively.
- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Motions in the Sky	1. Identify basic motions of celestial objects. 2. Apply celestial navigation terminology. 3. Compare distance scales.	4	4	0
Science and the Scientific Method	1. Recognize steps of the scientific method. 2. Evaluate between scientific and pseudo-scientific viewpoints.	1	2	0
Seasons	1. Describe the cause of the seasons and illustrate the path of the Sun as seen from different latitudes.	1	2	0
Lunar Phases and Eclipses	1. Identify and describe the phases of the Moon and the relative positions of Earth, the Moon, and the Sun. 2. Identify terminology and illustrate the geometrical configuration of solar and lunar eclipses.	3	2	0
Geocentric and Heliocentric Models	1. Recall basic terminology, historical figures, and evidence for the geocentric and heliocentric models. 2. State Kepler's laws of orbital motion. 3. Interpret Newton's laws of motion and gravity and their relationship to our view of the Solar System.	4	2	0
Sky Drills and Sky Quizzes	1. Identify basic navigational markers, stars, constellations, and asterisms in the night sky.	5	0	0
Light Spectra	1. Describe the properties of the bands of the electromagnetic spectrum. 2. Identify types of spectra. 3. Describe the process by which emission/absorption lines are created. 4. Identify blackbody characteristics. 5. Explain how spectra are used to determine properties of astronomical objects.	4	2	0
Telescopes	1. Identify parts of and advantages/disadvantages of different telescope designs. 2. Identify telescope properties and calculate magnification for a telescope. 3. Evaluate the necessity for space-based telescopes and telescopes for non-visible wavelengths.	3	2	0
The Solar System and Extrasolar Planets	1. Identify the components and layout of the Solar System. 2. Compare and contrast Terrestrial and Jovian planets. 3. Describe Solar System formation theory. 4. Describe detection methods and results from the search for extrasolar planets.	3	4	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Earth and the Moon	1. List the bulk properties of Earth. 2. Describe processes which shape planetary surfaces and the composition of planetary atmospheres. 3. Explain the dynamo model for planetary magnetic fields. 4. Explain how tides are created and how they relate to the Moon. 5. Compare the compositions of Earth and the Moon. 6. Describe lunar maria formation. 7. Evaluate lunar formation scenarios.	4	4	0
Terrestrial Planets	1. Compare the bulk properties of the Terrestrial planets. 2. Predict the geological and atmospheric conditions of other Terrestrial planets. 3. Identify features unique to each planet.	4	2	0
Jovian Planets	1. Compare the interior structures and compositions of Jovian worlds. 2. Compare and contrast Jupiter/Saturn with Uranus/Neptune. 3. Identify the physical nature and origin of ring systems. 4. Contrast the atmospheric dynamics of Jovian planets with Earth.	3	0	0
Jovian Moons, Pluto, and Small Bodies of the Solar System	1. Describe the process that produces features of the major Jovian moons: Io, Europa, Ganymede, Callisto, Titan, Enceladus, and Triton. 2. Compare and contrast Pluto with the planets and the Jovian moons. 3. Explain the physical nature of asteroids, comets, and smaller objects.	3	2	0
The Sun	1. Identify and describe features on the visible Sun. 2. Sketch the solar interior structure. 3. Describe the role of hydrostatic equilibrium throughout the Solar System. 4. Explain how the Sun generates energy and the supporting evidence. 5. Describe the solar atmosphere and the effects of solar activity.	3	2	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	30	0