ASTRONOMY AND
ASTROPHYSICS (ASTR)

ASTR Courses

ASTR 101. Introduction to the Solar System. 4 units
2020-21 or later catalog: GE Area B1
2019-20 or earlier catalog: GE Area B3
Descriptive astronomical properties of the Earth, Moon, other planets
and their satellites. Comets, asteroids and other members of the Solar
System. Theories of the formation of the Solar System. Opportunities for
telescope observations. Intended for non-engineering and non-science
majors. Not open to students who have completed or are taking ASTR
301 or ASTR 302. 4 lectures. Fulfills GE Area B1 (GE Area B3 for students
on the 2019-20 or earlier catalogs).

ASTR 102. Introduction to Stars and Galaxies. 4 units
2020-21 or later catalog: GE Area B1
2019-20 or earlier catalog: GE Area B3
Descriptive astronomical properties of the Sun, stars, galaxies and
interstellar material. Expanding universe and cosmological models.
Opportunities for telescope observations. Not open to students who have
completed or are taking ASTR 112, ASTR 301, ASTR 302, or PHYS 132. 4
lectures. Fulfills GE Area B1 (GE Area B3 for students on the 2019-20 or
earlier catalogs).

ASTR 200. Special Problems for Undergraduates. 1-2 units
Prerequisite: Consent of department chair.
Individual investigation, research, studies, or surveys of selected
problems. Total credit limited to 4 units, with a maximum of 2 units per
quarter.

ASTR 270. Selected Topics. 1-4 units
Prerequisite: Open to undergraduate students and consent of instructor.
Directed group study of selected topics. The Class Schedule will list topic
selected. Total credit limited to 8 units. 1 to 4 lectures.

ASTR 301. Planetary Systems. 3 units
Prerequisite: PHYS 132 or PHYS 122 and MATH 141 or MATH 161.
Quantitative and descriptive properties of planetary systems, including
our solar system. Physics of planets and their formation, moons, comets,
and interplanetary media. Extrasolar planets and astrobiology. 3 lectures.

ASTR 302. Stars and Galaxies. 3 units
Prerequisite: PHYS 122 or PHYS 132; and MATH 141 or MATH 161.
Quantitative and descriptive properties of stars, galaxies and interstellar
material; including stellar structure and evolution, and structure and
evolution of galaxies. 3 lectures.

ASTR 324. Longitude, Navigation, and Timekeeping. 4 units
2020-21 or later: Upper-Div GE Area B
2019-20 catalog: GE Area B7
2017-19 or earlier catalog: GE Area F
Prerequisite: MATH 119; junior standing; completion of GE Area A with
grades of C- or better; and completion of GE Areas B1 through B4, with a
grade of C- or better in one course in GE Area B4 (GE Area B1 for students
on the 2019-20 or earlier catalogs).
The state of navigation prior to 1800 and the world wide problem of
determining longitude at sea. Emphasis on historical and modern-
day scientific solutions to the longitude problem and navigation
technology, time and timekeeping, celestial navigation, and awareness of
 technological solutions to societal problems. 4 lectures. Fulfills GE Upper-
Division B (GE Area B7 for students on the 2019-20 catalog; GE Area F
for students on earlier catalogs).

ASTR 326. Cosmology. 3 units
Prerequisite: PHYS 211 (may be taken concurrently).
Introduction to the basic ideas of modern observational cosmology from
the Big Bang to the ultimate fate of the universe. Topics include: special
and general relativity, curvature of space, dark matter, dark energy, cosmic
microwave background, type Ia supernovae. 3 lectures.

ASTR 400. Special Problems for Advanced Undergraduates. 1-2 units
Prerequisite: Consent of department chair.
Individual investigation, research, studies, or surveys of selected
problems. Total credit limited to 4 units, with a maximum of 2 units per
quarter.

ASTR 404. Research Experience for Advanced Undergraduates. 1-2 units
CR/NC
Prerequisite: Consent of department chair.
Individual investigations, research, studies, or surveys of selected
problems. Credit/No Credit grading only. Total credit limited to 4 units,
with a maximum of 2 units per quarter.

ASTR 444. Observational Astronomy. 4 units
Prerequisite: ASTR 302.
Introduction to observational astronomy. Coordinate systems,
telescopes and observational instruments (CCDs, filters, spectrographs),
onobservational methods and techniques, data reduction and analysis.
Laboratory activities include use of a telescope, CCD camera for data
acquisition, data reduction and analysis, and presentation of results. 3
lectures, 1 laboratory.

ASTR 470. Selected Advanced Topics. 1-4 units
Prerequisite: Consent of instructor.
Directed group study of selected topics for advanced students. The Class
Schedule will list topic selected. Total credit limited to 8 units. 1 to 4
lectures.

ASTR 471. Selected Advanced Laboratory. 1-2 units
Prerequisite: Consent of instructor.
Directed group laboratory study of selected topics for advanced students.
The Class Schedule will list topic selected. Total credit limited to 8 units.
1 to 2 laboratories.