Astronomy (ASTRON)

ASTRON 1010: Introduction to Astronomy
Survey of methods of astronomy; description of the solar system, stellar astronomy, structure of the galaxy and the universe. Three hours of lecture and one hour of lab per week (scheduled by the instructor). Satisfies physical science laboratory requirement. Laboratory section: Survey of astronomical methods, instruments, observations and measurement techniques.

Credit Hours: 4
Recommended: MATH 1100 or MATH 1120 or equivalent

ASTRON 1020: Introduction to Laboratory Astronomy
Laboratory supplement to Astronomy 1010. Satisfies physical science laboratory requirement. Survey of astronomical methods, instruments, observations and measurement techniques.

Credit Hours: 2
Recommended: MATH 1100 or MATH 1120

ASTRON 3010: Introduction to Modern Astrophysics
(same as PHYSCS 3010). Elements of stellar, and galactic astrophysics. Interpretation of observations and physical conditions of various astronomical objects including stars, gaseous nubulea and, galaxies.

Credit Hours: 3
Prerequisites: PHYSCS 2760

ASTRON 4020: Astrophysical Techniques
(same as PHYSCS 4020; cross-leveled with ASTRON 7020, PHYSCS 7020). Elements of modern astronomical instruments, observations and analysis, with the emphasis in the optical regime. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: PHYSCS 2760

ASTRON 4180: Solar System Science
(same as PHYSCS 4180, GEOL 4180; cross-leveled with ASTRON 7180, PHYSCS 7180, GEOL 7180). Investigates physical states, interior structures and comparative geology of solar systems bodies: planets, moons, asteroids, comets, sun. Solar system formation and evolution.

Credit Hours: 3
Prerequisites: PHYSCS 2760 or PHYSCS 1220 or instructor's consent
Recommended: MATH 1700

ASTRON 4250: Stellar Astrophysics
(same as PHYSCS 4250). Basic astrophysics of stable and unusual stars, stellar systems. Investigates stellar dimensions, radiation, spectra, energy, evolution, populations; interstellar medium, stellar motions and aggregation.

Credit Hours: 3
Prerequisites: PHYSCS 3150 or instructor's consent

ASTRON 4350: Galactic Astronomy
(same as PHYSCS 4350). Observational properties of normal galaxies and clusters of galaxies, Seyfert and emission-line structure and dynamics of galaxies; interacting galaxies, quasi-steller objects. Introduction to cosmology.

Credit Hours: 3
Prerequisites: PHYSCS 3010 or instructor's consent
Recommended: PHYSCS 4140

ASTRON 4360: Extragalactic Astronomy
(same as PHYSCS 4360; cross-leveled with ASTRON 7360). This course introduces students to the most basic knowledge of extragalactic astronomy, starting from Milky Way and extending to the most distant universe. Topics covered will include galaxy morphology and classification, groups and clusters of galaxies, active galactic nuclei, and galaxy formation and evolution.

Credit Hours: 3
Prerequisites: PHYSCS 2760

ASTRON 4460: Interstellar Medium
(same as PHYSCS 4460). The course discusses observational properties and physical and chemical processes occurring in the interstellar medium. Topics include interstellar diffuse and molecular clouds, HII regions, dust grains, interstellar chemistry, star formation, supernova remnants, and interstellar shock waves.

Credit Hours: 3
Prerequisites: PHYSCS 2760 or PHYSCS 1220 or instructor's consent

ASTRON 4550: Cosmochemistry
(same as PHYSCS 4550; cross-leveled with ASTRON 7550, PHYSICS 7550). Cosmic dust, stardust, spectra, energy, interstellar medium, meteorites, astromineralogy.

Credit Hours: 3
Prerequisites: PHYSCS 2760 or PHYSCS 1220 or instructor's consent

ASTRON 4950: Undergraduate Research in Astronomy
Special studies in astronomy; covers subjects not included in courses regularly offered.

Credit Hour: 1-99
Prerequisites: instructor's consent

ASTRON 4960: Senior Thesis in Astronomy
Special studies for senior undergraduate students in astronomy. The course requires an oral or poster presentations, or faculty-guided writing of a senior thesis involving independent research. Departmental consent required for repetition. Enrollment limited to students who have completed 3 credit hours of ASTRON 4950 or PHYSCS 4950.

Credit Hours: 3
Prerequisites: instructor's consent

ASTRON 7020: Astrophysical Techniques
(same as PHYSCS 7020; cross-leveled with ASTRON 4020, PHYSCS 4020). Elements of modern astronomical instruments, observations and analysis, with the emphasis in the optical regime. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: PHYSCS 2760
ASTRON 7180: Solar System Science
(same as PHYSCS 7180, GEOL 7180; cross-leveled with ASTRON 4180, PHYSCS 4180, GEOL 4180). Investigates physical states, interior structures and comparative geology of solar systems bodies: planets, moons, asteroids, comets, sun. Solar system formation and evolution.

**Credit Hours:** 3
**Prerequisites:** PHYSCS 1220 or PHYSCS 2760 or instructor's consent

ASTRON 7360: Extragalactic Astronomy
(same as PHYSCS 7360; cross-leveled with ASTRON 4360, PHYSICS 4360). This course introduces students to the most basic knowledge of extragalactic astronomy, starting from Milky Way and extending to the most distant universe. Topics covered will include galaxy morphology and classification, groups and clusters of galaxies, active galactic nuclei, and galaxy formation and evolution.

**Credit Hours:** 3
**Prerequisites:** PHYSCS 2760

ASTRON 7550: Cosmochemistry
(same as PHYSCS 7550; cross-leveled with ASTRON 4550, PHYSCS 4550). Chemistry of cosmic dust and molecules.

**Credit Hours:** 3
**Prerequisites:** PHYSCS 2760 or PHYSCS 1220; instructor's consent

ASTRON 7750: Interstellar Medium
(same as PHYSCS 7750; cross-leveled with ASTRON 4750, PHYSCS 4750). The course discusses observational properties and physical and chemical processes occurring in the interstellar medium. Topics include interstellar diffuse and molecular clouds, HII regions, dust grains, interstellar chemistry, star formation, supernova remnants, and interstellar shock waves.

**Credit Hours:** 3
**Prerequisites:** PHYSCS 1220 or PHYSCS 2760

ASTRON 8301: Topics in Astronomy and Astrophysics
(same as PHYSCS 8301). Selected topics from solar system, stellar galactic and extragalactic astronomy and astrophysics. May be repeated to a maximum of 6 hours.

**Credit Hours:** 3
**Prerequisites:** instructor's consent

ASTRON 8310: College Science Teaching
(same as PHYSCS 8310, BIO_SC 8724 and LTC 8724). Study of learner characteristics, teaching strategies, and research findings related to teaching science at the post-secondary level.

**Credit Hours:** 3

ASTRON 8550: Stellar Structure and Evolution
(same as PHYSCS 8550). Reviews of atomic and molecular spectra. Investigates quantum radiation law, emission and absorption processes, radiation transfer theory, continuous and discrete line spectra of stars, stellar composition.

**Credit Hours:** 3