

Astronomy and Astrophysics (ASTR)

ASTR 101 Current Topics in Astrophysics 1 Credit (2,0)

Survey seminar on contemporary astrophysics research; career topics; development of discipline standards; critical thinking, time management, study skills, internships, student organizations, university services.

Prerequisites: Open only to BSAA majors

Course Offered at: Daytona Beach

ASTR 180L Introductory Astronomy Laboratory 1 Credit (0,3)

Basic features of the night sky and how to observe them. Identifying important astronomical objects; visual investigation of astronomical objects; telescope designs and usage; astrophotography of bright objects; safely observing the Sun; gathering basic scientific information on astronomical objects. Assumes no prior Astronomy or Physics coursework.

Course Offered at: Prescott

ASTR 199 Special Topics in Astronomy and Astrophysics 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in astronomy & astrophysics.

Course Offered at: Daytona Beach, Prescott

ASTR 204 General Astronomy 3 Credits (3,0)

Focuses on celestial mechanics, light and spectra, telescopes, the solar system, and exoplanets. Geared towards Space Physics and Astronomy students.

Prerequisites: PHYS 161 or a corequisite of PHYS 227

Course Offered at: Prescott

ASTR 222 Intermediate Astronomy 3 Credits (3,0)

Explores the sun, stars, galaxies, and the universe, with emphasis on observational properties and introductory physics applications.

Prerequisites: ASTR 204

Corequisites: PHYS 228 or PHYS 250

Course Offered at: Prescott

ASTR 224 Astronomy 3 Credits (3,0)

Focuses on the physical universe, covering topics such as the solar system, stars, black holes, galaxies, quasars, cosmology, and exobiology.

Course Offered at: Daytona Beach, Worldwide

ASTR 224L Introductory General Astronomy Laboratory 1 Credit (0,1)

Hands-on laboratory supplement to Introductory Astronomy, with a focus on observational techniques and astronomy fundamentals.

Corequisites: ASTR 224

Course Offered at: Daytona Beach

ASTR 299 Special Topics in Astronomy and Astrophysics 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in astronomy and astrophysics.

Course Offered at: Daytona Beach, Prescott, Worldwide

ASTR 316 Introductory Astronomy and Astrophysics I 3 Credits (3,0)

Physics-based structure and evolution of the physical universe; Solar System; planets orbiting other stars; astrobiology; star formation, stellar evolution, nucleosynthesis; white dwarfs, neutron stars, black holes.

Corequisites: PHYS 227

Course Offered at: Daytona Beach

ASTR 317 Introductory Astronomy and Astrophysics II 3 Credits (3,0)

Covering galaxies, active galactic nuclei, cosmology, the Big Bang, and primordial nucleosynthesis.

Prerequisites: ASTR 316

Course Offered at: Daytona Beach

ASTR 318L Introductory Astrophysics Laboratory 1 Credit (0,1)

Weekly three-hour laboratory session supplementing Introductory Astronomy and Astrophysics sequence; preparation for Observational Astronomy course; observationally intensive experience for technical students passionate about astronomy.

Prerequisites: ASTR 316

Course Offered at: Daytona Beach

ASTR 332 Techniques of Observational Astronomy 3 Credits (2,3)

Covers astronomical observation techniques, including telescope operation, light detection, and data analysis of celestial objects.

Prerequisites: ASTR 222 and PHYS 232 and (PHYS 228 or PHYS 250)

Course Offered at: Prescott

ASTR 340 Astrophysics I 3 Credits (3,0)

Examines stellar structure, evolution, interstellar medium, galaxies, and cosmology. Emphasizes astrophysical processes common to astronomical systems.

Prerequisites: ASTR 222 and PHYS 303 and MATH 345

Course Offered at: Prescott

ASTR 341 High Energy Astrophysics 3 Credits (3,0)

Introduction to the subject of High Energy Astrophysics. Relativistic phenomena, X-ray emission, Gamma-Ray emission, jet flows, non-thermal particle acceleration, strong magnetic fields, ionized plasmas, compact objects, accretion flow, description of X-ray detectors, interaction with real data from X-ray telescopes.

Prerequisites: PHYS 303

Course Offered at: Prescott

ASTR 345 Astrophysics and Space Science Seminar 2 Credits (2,0)

Seminar-style course; lectures, readings, and writings on current topics in Astrophysics and Space Science.

Prerequisites: ASTR 317

Course Offered at: Daytona Beach

ASTR 399 Special Topics in Astronomy and Astrophysics 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in astronomy and astrophysics.

Course Offered at: Daytona Beach, Prescott

ASTR 401 Stellar Astrophysics 3 Credits (3,0)

Basic physical processes in stars; stellar structure and evolution.

Prerequisites: ASTR 317

Course Offered at: Daytona Beach

ASTR 402 Interstellar Medium and Galaxies 3 Credits (3,0)

Physical processes in the interstellar medium; interstellar dust and gas; protostar formation; Milky Way morphology, kinematics; Galactic Center; Hubble sequence; spiral and elliptical galaxies; galaxy interactions and formation.

Prerequisites: ASTR 401

Course Offered at: Daytona Beach

ASTR 403 Cosmology and the Structure of the Universe 3 Credits (3,0)

Current relativistic cosmological models; universe age and distance scales; hot big bang; primordial nucleosynthesis; inflation; baryonic and non-baryonic matter; galaxy formation; cosmic microwave background fluctuations. Emphasis on observations motivating, measuring, and testing the standard Lambda-CDM model.

Prerequisites: ASTR 401

Course Offered at: Daytona Beach

ASTR 408 Astrophysics II 3 Credits (3,0)

Radiative transfer in astrophysical environments; stellar atmospheres, stellar interiors, and gaseous nebulae. Emission and absorption processes. Interactions of radiation with matter.

Prerequisites: PHYS 303 and MATH 345 and (ASTR 222 or ASTR 401)

Course Offered at: Daytona Beach, Prescott

ASTR 420 Planetary Interiors, Surfaces, and Atmospheres 3 Credits (3,0)

Origin, evolution, composition, interiors, surfaces, atmospheres, magnetospheres of planets in our solar system; planetary meteorology; mineralogy; surface geology and morphology; magnetic fields. Experiments, spacecraft missions, observations, remote sensing techniques.

Prerequisites: PHYS 303 and (ASTR 316 or PHYS 330)

Course Offered at: Daytona Beach, Prescott

ASTR 422 Solar System Dynamics 3 Credits (3,0)

Dynamics of planetary systems; formation and dynamical evolution of the solar system; planetary dynamics, small bodies, satellites, rings; orbital perturbations, resonances, three-body problem; asteroid and comet properties.

Prerequisites: PHYS 303 and ASTR 316

Course Offered at: Daytona Beach

ASTR 425 Observational Astronomy 3 Credits (2,3)

Design and use of optical telescopes; fundamentals of astronomical optics; refracting and reflecting systems; optical filters, adaptive optics; telescope system calibration; digital observation techniques; analysis of astronomical images.

Prerequisites: Open only to BSAA majors, PHYS 303 and PHYS 303L and ASTR 317 and ASTR 318L

Course Offered at: Daytona Beach

ASTR 430L Astronomical Optics and Instrumentation Laboratory 3 Credits (0,3)

Optical methods in astronomy; advanced laboratory techniques; optics and design of astronomical instrumentation; telescopes, photometers, spectrometers, interferometers; hands-on experience in optical systems.

Prerequisites: ENGP 330 and ASTR 318L

Course Offered at: Daytona Beach

ASTR 490 Senior Thesis I 3 Credits (2,3)

First semester of a senior research project for Astronomy students, culminating in a research paper with faculty supervision.

Prerequisites: ASTR 340 or ASTR 408

Course Offered at: Prescott

ASTR 491 Senior Thesis II 3 Credits (1,6)

Completion of senior research project with final research paper following scientific publishing standards.

Prerequisites: ASTR 490

Course Offered at: Prescott

ASTR 492 Senior Astrophysics Project 3 Credits (3,0)

Optional capstone for senior Astronomy and Astrophysics students; senior research project in an area of interest overlapping with supervising faculty's research.

Prerequisites: ENGP 323 and Cumulative GPA or 3.5 or greater

Course Offered at: Daytona Beach

ASTR 499 Special Topics in Astronomy and Astrophysics 1-6 Credit (1-6,0)

Individual, independent, or directed studies of selected topics in astronomy and astrophysics.

Course Offered at: Daytona Beach, Prescott