ASTRONOMY AND ASTROPHYSICS

Not all courses are offered every semester. Refer to the schedule of courses for each term's specific offerings.
More Info (https://one.uf.edu/soc/)

Unless otherwise indicated in the course description, all courses at the University of Florida are taught in English, with the exception of specific foreign language courses.

Department Information

The Department of Astronomy is home to a vibrant community actively engaged in research, education, and outreach. The department's faculty are involved in a wide range of research programs (https://www.astro.ufl.edu/research/) using world-class resources including an in-house design-through-fabrication instrumentation program (https://www.astro.ufl.edu/instrumentation/past-current-projects/), partner level access to the Gran Telescope Canarias (https://www.astro.ufl.edu/research/telescopes/), the HiPerGator-2 (https://www.astro.ufl.edu/research/computing/) supercomputer, and more.
More Info (https://www.astro.ufl.edu/)

CONTACT

Email (psell@ufl.edu) | 352.294.1870 (tel) | 352.392.5089 (fax)

P.O. BOX 112055
211 BRYANT SPACE SCIENCE CENTER
GAINESVILLE FL 32611-2055
Map (http://campusmap.ufl.edu/#/index/0038)

Curriculum

- Astrobiology and Planetary Science Minor
- Astronomy Minor

Courses

AST 1002 Discovering the Universe 3 Credits
Grading Scheme: Letter Grade
This course provides a comprehensive look at modern astronomy, emphasizing the use of the scientific method and the application of physical laws to understand the universe including earth and its environment. Throughout this course, students will develop the ability to discern scientific knowledge from non-scientific information by using critical thinking.
Attributes: General Education - Physical Science

AST 1022L Astronomy Laboratory 1 Credit
Grading Scheme: Letter Grade
Introduces experimental work in astronomy including scheduled laboratory exercises during the day in the teaching lab and evening observational astronomy at the on campus teaching observatory. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: General Education - Physical Science

AST 2000 Cosmology 3 Credits
Grading Scheme: Letter Grade
Overview of cosmology, the study of the large-scale structure and history of the universe, in four components: ideas about the universe as a whole predating the twentieth century; ideas from twentieth century physics that impact modern cosmology; stars, black holes, galaxies and quasars as probes of the universe; and the Hot Big Bang Model.

AST 2003 Introduction to the Solar System 3 Credits
Grading Scheme: Letter Grade
Survey of the solar system: sun, planets, satellites, asteroids, meteorites and comets. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: simple algebra.
Attributes: General Education - Physical Science

AST 2005 Are We Alone? Searching for ET Life 3 Credits
Grading Scheme: Letter Grade
Covers nature and limits of life, distribution of habitable environments in the Universe, search and probability of finding extraterrestrial life. Explores societal and personal impact of astrobiology by examining international policies and science fiction
Attributes: Quest 2

AST 2023 Astrophotography: Art & Science 3 Credits
Grading Scheme: Letter Grade
Overview of Astrophotography. Basic telescope, camera and image processing techniques. Impact of light pollution and artificial satellites on the night sky. Technological, environmental, and societal impact of Astrophotography. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: Quest 2, General Education - Physical Science

AST 2031 Knowledge and the Universe 3 Credits
Grading Scheme: Letter Grade
Describes and evaluates the Bayesian inference model in various astronomical contexts and with regard to pressing societal issues. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: Quest 2, General Education - Physical Science

AST 2032 Nature of Time 3 Credits
Grading Scheme: Letter Grade
This course will thoroughly investigate some of the most interesting topics in contemporary physics— the arrow of time, irreversibility, quantum mechanics, cosmology—through the lens of big questions. This class is accessible to non-physics majors—indeed, to those with minimal technical background at all—and will focus on the concepts, exploring the key ideas with almost no math. At the same time, we will mix in ideas from philosophy, history, and art that also bear on these questions. This will make the course relevant and exciting both for those who feel a strong affinity with the arts and humanities as well as for those for whom science resonates more. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: Quest 2, General Education - International, General Education - Physical Science, Satisfies 2000 Words of Writing Requirement

AST 2034 Stars and the Nuclear Arms Race 3 Credits
Grading Scheme: Letter Grade
Introduces astronomical events identified as the sites of formation of the heaviest elements in the universe, especially uranium, and their connections to nuclear weapons that have shaped global politics and local environmental policy over the last few generations. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: Quest 2, General Education - Physical Science

AST 2037 Life in the Universe 3 Credits
Grading Scheme: Letter Grade
Considers the origin of life on earth and the possibility of its existence elsewhere. A multidisciplinary approach is followed. Conditions for life to form, and the likelihood that such conditions may exist elsewhere in the universe, are discussed. Also considered are schemes proposed for the search for extraterrestrial intelligence (SETI). This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: General Education - Physical Science

AST 2730 Introduction to Python for Physical Sciences 4 Credits
Grading Scheme: Letter Grade
Learn syntax, capabilities, and foundations of Python and basic numerical methods to address physical problems with a computational approach. Covers basics of dataset manipulation, algorithm development, and plotting.
Attributes: Artificial Intelligence

AST 3018 Astronomy and Astrophysics 1 3 Credits
Grading Scheme: Letter Grade
First part of a two part sequence. Survey of astronomy and astrophysics for physical science, engineering, or mathematics majors. Covers gravitation, orbits and tides; the Moon's phases and eclipses; light and spectra; the solar system; and a few historical milestones.
Prerequisite: (PHY 2048 or PHY 2060) and (MAC 2311 or MAC 3472).
Corequisite: PHY 2049.

AST 3019 Astronomy and Astrophysics 2 3 Credits
Grading Scheme: Letter Grade
Second part of a two part sequence. Survey of astronomy and astrophysics for physical science, engineering or mathematics majors. Covers compact objects; the Solar System; exoplanets; the Milky Way and galaxies; cosmology and relativity.
Prerequisite: (PHY 2048 or PHY 2060) and (MAC 2311 or MAC 3472).
Corequisite: PHY 2049.

AST 3043 History of Astronomy through Newton 3 Credits
Grading Scheme: Letter Grade
Astronomy from its beginnings through Newton. Emphasizes the works of Ptolemy, Copernicus, Kepler, Galileo, and Newton.
Prerequisite: (MAC 1105 or MAC 1114) or higher.
Attributes: General Education - International

AST 3722C Techniques of Observational Astronomy 1 3 Credits
Grading Scheme: Letter Grade
First part of the AST 3722C-4723C sequence. The fundamental principles and techniques used in planning, making, reducing and analyzing modern astronomical observations. Includes classroom lectures and discussion, indoor laboratory work, data analysis and outdoor night observations. Introduces numerical treatment of observations, CCD imaging, digital imaging processing and astronomical spectroscopy.
Corequisite: AST 3018.

AST 3902 Experiential Learning in Astronomy 0-3 Credits
Grading Scheme: Letter Grade
Offers credit for experiential learning engagement and reflection related to the discipline of Astronomy.
Prerequisite: Sophomore standing or above.
Attributes: Quest 3

AST 4111 Exoplanets 3 Credits
Grading Scheme: Letter Grade
Fundamentals of planets orbiting stars other than the sun. Topics in both theory and observation, including orbital mechanics, tides, Atmospheres, detection methods, and demographics. Appropriate for upper-level students in the natural sciences.
Prerequisite: AST3018 or PHY2048 or PHY2049 or CHM2045 or CHM2046 or BSC2010 or BSC2011.

AST 4170 Life Across the Cosmos: Astrobiology for Physical Sciences 3 Credits
Grading Scheme: Letter Grade
Explores the possible existence of extraterrestrial life in the context of the formation and evolution of the universe, galaxies, stars, and planets. Considers essential concepts in physics, chemistry, biology, and geology that bear directly on this narrative, such as the nature of habitability, the origin of life, its adaptation to extreme environments, and proposed biosignatures on alien worlds. Incorporates quantitative analyses supporting key conclusions.
Prerequisite: (MAC2311 or higher-level MAC course) & (PHY2020 or higher PHY course).

AST 4211 Essentials of Astrophysics 3 Credits
Grading Scheme: Letter Grade
Foundation and background on topics in astrophysics, including broadening mechanisms of spectral lines, equations of state of gases, thermodynamics, radiation sources, radiative transport, kinetic theory of gases and stellar structure.
Prerequisite: AST 3018, AST 3019 and a working knowledge of calculus.

AST 4300 Galactic Astronomy 3 Credits
Grading Scheme: Letter Grade
Intensive introduction to the fundamental properties of the Milky Way and its system of satellite galaxies. Course is intended for astronomy majors and natural science students. Topics include the ages, chemical abundances and kinematics of field stars and star clusters, the properties of the interstellar medium and its role in star formation, the dark matter content and models of the Milky Way's physical structure.
Prerequisite: AST 3018, AST 3019 and a working knowledge of calculus.

AST 4402 Galaxies and Cosmology 3 Credits
Grading Scheme: Letter Grade
An investigation into the properties of galaxies and their distribution in space. Some cosmological implications of this distribution are discussed. Intended for astronomy majors and advanced students of other mathematical sciences.
Prerequisite: AST 3018, AST 3019 and a working knowledge of calculus.

AST 4723C Techniques of Observational Astronomy 2 3 Credits
Grading Scheme: Letter Grade
Second part of a sequence. The fundamental principles and techniques used in planning, making, reducing, and analyzing modern astronomical observations. Includes classroom lectures and discussion, indoor laboratory work, data analysis, and outdoor night observations. Introduces numerical treatment of observations, CCD imaging, digital imaging processing, and astronomical spectroscopy.
Prerequisite: AST 3722C.

AST 4905 Individual Work 1-3 Credits
Grading Scheme: Letter Grade
Assigned reading or research for qualified undergraduates.
Prerequisite: AST 3018 and AST 3019, or two years of college physics and instructor permission.

AST 4911 Undergraduate Research in Astronomy 0-3 Credits
Grading Scheme: Letter Grade
Provides firsthand, supervised research in Astronomy. Projects may involve inquiry, design, investigation, scholarship, discovery or application in Astronomy.

AST 4930 Special Topics 1-3 Credits
Grading Scheme: Letter Grade
Lecture, seminar or laboratory sessions covering selected topics of current interest in astronomy.
Prerequisite: instructor permission.

PHZ 3152 Advanced Computational Techniques 3 Credits
Grading Scheme: Letter Grade
Advanced Computational Techniques in Astronomy and Physics. Advanced techniques in computational methods in the natural sciences and numerical analysis. Includes version controlling and programming in distributed environments; grid construction and convergence techniques; numerical differentiation; linear algebra; root finding; differential equations; Monte Carlo simulations; open source project development.
Prerequisite: MAC 2312 or equivalent.
Attributes: Artificial Intelligence