ASTRONOMY (ASTR)

ASTR 0--. ASTR LOWER DIVISION. (1-10 Credits)
Lower Level Coursework in Astronomy
Level: Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Transfer
Schedule type(s): Lecture
Area(s) of Inquiry: None

ASTR 001. DESCRIPTIVE ASTRONOMY. (3 Credits)
A one semester course, primarily for non-majors, focusing on the highlights of results obtained from a study of the universe, including the solar system, stellar evolution, galaxies, black holes and cosmology. Emphasis on physical principles, the deductive process and the impact of the developing knowledge on society. Three hours lecture per week. No prereq.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: Physical Science, Scientific Literacy

ASTR 01L. DESCRIPTIVE ASTRONOMY LAB. (1 Credit)
Optional laboratory program that complements ASTR 1. Rooftop night observations, laboratory bench experiments and observations at the Drake Municipal Observatory. Formal reports including numerical computations required. Three hours one evening per week.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): ASTR 001 (may be taken concurrently)
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lab, Web Instructed
Area(s) of Inquiry: Physical Science, Scientific Literacy

ASTR 1--. ASTR UPPER DIVISION. (1-10 Credits)
Upper Level Coursework in Astronomy
Level: Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Transfer
Schedule type(s): Lecture, Web Instructed
Area(s) of Inquiry: None

ASTR 003. CONTEMPORARY TOPICS SEMINAR. (1 Credit)
A seminar course introducing students to contemporary developments and problems in Physics and Astronomy presented by the faculty. The purpose of the course is to share the fascination and excitement of Physids and Astronomy, learn what to anticipate in their studies of these fields and become informed on the professional opportunities. The course also serves as an introduction to scientific presentation and writing.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ASTR 041. ASTRONOMICAL TECHNIQUES. (3 Credits)
This course is an introduction to the basic tools and analytical concepts used in modern astronomical research. A project-based course, students will be involved in astronomical observation, data reduction and analysis. Emphasis will be placed on observational techniques using modern digital detectors, specifically CCDs. The class is primarily but not exclusively designed for astronomy majors. A strong background in trigonometry and analytical geometry will be assumed.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): ASTR 001 and MATH 050
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ASTR 051. GENERAL ASTRONOMY. (3 Credits)
A survey of the solar system, planetary motions, binary stars, the sun as a star, evolution of stars, and stellar structure. Emphasis on mathematical descriptions and model development. Three hours lecture per week.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): ASTR 001 and PHY 001 (may be taken concurrently) and MATH 050
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ASTR 071. PROBLEMS IN POSITIONAL ASTRONOMY. (2 Credits)
The celestial sphere in relation to the earth. Latitude, longitude, time, positions, and motions of celestial bodies. Occasional observations at the Drake Municipal Observatory. Prereq. or coreq.: Plane trigonometry and consent of instructor.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ASTR 150. SELECTED TOPICS. (1-3 Credits)
Study of a selected field in astronomy, according to student's interests, such as practical astronomy, astrophysics, binary stars, celestial mechanics, etc.
Level: Graduate, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ASTR 151. SELECTED TOPICS. (1-3 Credits)
Study of a selected field in astronomy, according to student's interests, such as practical astronomy, astrophysics, binary stars, celestial mechanics, etc.
Level: Graduate, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ASTR 180. INDEPENDENT STUDY. (1-3 Credits)
Directed individual study or projects in special topics, according to student's interests. A maximum of six hours may be taken by any one student in these courses. Requires consent of instructor.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Lecture, Web Instructed
Area(s) of Inquiry: None

ASTR 182. INDEPENDENT STUDY. (1-3 Credits)
Directed individual study or projects in special topics, according to student's interests. A maximum of six hours may be taken by any one student in these courses. Requires consent of instructor.
Level: Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): None
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Lecture, Web Instructed
Area(s) of Inquiry: None

ASTR 185. INTRODUCTION TO ASTROPHYSICS I. (3 Credits)
An advanced course that discusses the physics of stars and stellar evolution. Topics include star formation, review of stellar evolution and nucleosynthesis, matter and radiation in stars, heat transfer in stars, fusion reactions, stellar structure models (analytical and numerical), white dwarfs, neutron stars and black holes. Three hours of lecture per week.
Level: Graduate, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): PHY 050
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None

ASTR 195. INTRODUCTION TO ASTROPHYSICS II. (3 Credits)
An advanced course that reviews the Milky Way, the nature of galaxies, galactic dynamics (including potential theory, stellar orbits, disk dynamics and spiral structure), galactic evolution, active galaxies, structure of the universe, cosmological models and the early universe. Three hours of lecture per week.
Level: Graduate, Non Degree Coursework, Professional Health Care, Undergraduate
Prerequisite(s): PHY 050
Corequisite(s): None
Restrictions: None
Primary grade mode: Standard Letter
Schedule type(s): Independent Study, Lecture, Web Instructed
Area(s) of Inquiry: None