

## **UNDERGRADUATE ASTRONOMY COURSES (2016-2017 catalog)**

### **ASTR1010 Survey Of Astronomy [3 credit hours]**

Not for major credit; not open to science majors; no credit after 2010, 2020. General astronomy, including appearance of the sky and nature and evolution of the Earth, Moon, solar system, stars, galaxies and the Universe.

### **ASTR2010 Solar System Astronomy [3 credit hours]**

A quantitative introduction to the contents, origin and evolution of the solar system, as revealed by recent advances in space exploration. High school mathematics at the level of graphs, algebra and elementary logarithms is required.

### **ASTR2020 Stars, Galaxies, And The Universe [3 credit hours]**

A quantitative introduction to the nature and evolution of stars, galaxies and the universe, as revealed by observation and physical theory. High school mathematics at the level of graphs, algebra and elementary logarithms is required.

### **ASTR2050 Elementary Astronomy Laboratory [1 credit hour]**

Laboratory exercises and observational measurements in elementary astronomy. Two hours laboratory per week. (not for major credit)

### **ASTR2310 Mars [3 credit hours]**

The history of observations of Mars, information gathered during the space program, potential for human exploration and colonization and related contemporary science fiction. High school algebra and graphs will be used.

Prerequisites: ASTR 1010 FOR LEVEL UG WITH MIN. GRADE OF D- OR ASTR 2010 FOR LEVEL UG WITH MIN. GRADE OF D-

### **ASTR2320 Life In The Universe [3 credit hours]**

The astronomical factors involved in the emergence of life in the universe, the search for extraterrestrial intelligence and the likelihood of advanced civilizations in the Galaxy. May be offered as writing intensive.

Prerequisites: ASTR 1010 FOR LEVEL UG WITH MIN. GRADE OF D- OR (ASTR 2010 FOR LEVEL UG WITH MIN. GRADE OF D- AND ASTR 2020 FOR LEVEL UG WITH MIN. GRADE OF D-)

### **ASTR2330 Black Holes, General Relativity And The Big Bang Theory [3 credit hours]**

Descriptive discussion of the theory of general relativity, the final states of stellar evolution, black holes and history of the universe from the big bang through the formation of the solar system. May be offered as writing intensive.

Prerequisites: ASTR 1010 FOR LEVEL UG WITH MIN. GRADE OF D- OR ASTR 2020 FOR LEVEL UG WITH MIN. GRADE OF D-

### **ASTR2340 New Frontiers In Astronomy [3 credit hours]**

Descriptive treatment of recent developments in astronomy from spacecraft, such as the Hubble Space Telescope, or from the newest, very large ground based telescopes. May be offered as a writing intensive.

Prerequisites: ASTR 1010 FOR LEVEL UG WITH MIN. GRADE OF D- OR ASTR 2010 FOR LEVEL UG WITH MIN. GRADE OF D- OR ASTR 2020 FOR LEVEL UG WITH MIN. GRADE OF D-

**ASTR3880 Foundations of Astronomy** [4 credit hours]

Positional Astronomy and Time; Telescopes and Optics; Detection and Characterization of Light (Imaging, Photometry and Spectroscopy); Data Reduction and Measurements; Fundamental Techniques of Astronomy (Parallax, Magnitudes, Interstellar Extinction, Doppler Shift and Spectral Line Widths, Stellar Classification, Color-Magnitude and Color-Color Diagrams, Lightcurves, and Redshifts); Measuring Properties of Stars, Star Clusters, Galaxies, and the Universe.

Prerequisites: ASTR 2020 FOR LEVEL UG WITH MIN. GRADE OF D- AND PHYS 3310 FOR LEVEL UG WITH MIN. GRADE OF D- AND MATH 3610 FOR LEVEL UG WITH MIN. GRADE OF D-

**ASTR4800 Astronomy In The Planetarium** [3 credit hours]

Theory and practice of astronomical outreach programming. Sky and calendar, mythology, constellations, astrophysics, buying and using small telescopes, operating and maintaining planetarium projectors, sky simulation software, projects and program production.

Prerequisites: ASTR 1010 FOR LEVEL UG WITH MIN. GRADE OF D- OR ASTR 2010 FOR LEVEL UG WITH MIN. GRADE OF D- OR ASTR 2020 FOR LEVEL UG WITH MIN. GRADE OF D-

**ASTR4810 Astrophysics I** [3 credit hours]

Spherical coordinate systems, astronomical time, celestial mechanics, the solar system and planetary physics, photometry, radiative transfer, stellar spectra and classification, binary stars and stellar masses.

Prerequisites: ASTR 3880 FOR LEVEL UG WITH MIN. GRADE OF D-

**ASTR4820 Astrophysics II** [3 credit hours]

Stellar structure and evolution, close binaries, origin of the elements, the sun, variable stars, star clusters, the interstellar medium, the Milky Way Galaxy, stellar statistics, galaxy structure and evolution, cosmology.

**ASTR4880 Astrophysical Measurements** [3 credit hours]

Astronomical, optical and electronic principles of operation of a modern astronomical observatory. Observing with the 1 meter telescope of Ritter Observatory, introduction to reduction, analysis and interpretation of astrophysical data. Six hours laboratory per week. May be offered as writing intensive.

Prerequisites: ASTR 3880 FOR LEVEL UG WITH MIN. GRADE OF D-