

AST 211: Introduction to Astrophysics

This majors-level course is an introduction to the theory, principles, and application of modern astrophysics. Topics include the internal structure of the Sun and stars, orbital dynamics, theories of special and general relativity, and properties of stars and their evolution. The laboratory section is focused on the application of these topics to real-world examples and may include analysis of data from space telescopes, computational physics, and mathematical modeling of astronomical phenomena. Prerequisite: PHY 212. Three lecture hours and three laboratory hours per week. Instructional Support Fee applies. Gen. Ed. Competencies Met: Scientific Reasoning and Discovery.

Course Student Learning Outcomes

1. Students will demonstrate their knowledge of basic facts, principles, theories, and methods of a modern physics, astronomy and mathematics, as well as their relevance to modern culture and society. 2. Students will have a fundamental understanding and awareness of stellar parameters and how they determine the stellar classification system. 3. Students will have experience with the four ordinary differential equations describing stellar structure and their boundary conditions. 4. Students will have a description of basic stellar formation and evolution from the main sequence of the Hertzsprung-Russell diagram to a star's death. 5. Students will have an understanding of hydrostatic equilibrium, nuclear fusion, degeneracy pressure and the life of a star. 6. Students will have a basic understanding of cosmology with a focus on the the Big Bang Theory. 7. Students will have a basic understanding of the roles of relativity theory and quantum mechanics as to how they inform astrophysics.

Credits: 4

Program: Astronomy