SAN JUAN COLLEGE
Success Matters

ASTR 1135 Deep-Space Astronomy 3 CREDITS

SYLLABUS

CATALOG DESCRIPTION

Conceptual study of cosmology and relativity, emphasizing the Einsteinian perceptions of gravity, matter, energy, and space-time geometry. Also examines in detail anomalistic subjects such as black holes, wormholes, "white fountains," and obstacles to superluminal ("faster than light") travel.

Co-requisite: ASTR 1115

Semester Offered: Fall, Spring

Common Student Learning Outcomes

Upon successful completion of San Juan College programs and degrees, the student will demonstrate competency in…

BROAD AND SPECIALIZED LEARNING

Students will actively and independently acquire, apply, and adapt skills and knowledge with an awareness of global contexts.

CRITICAL THINKING

Students will think analytically and creatively to explore ideas, make connections, draw conclusions and solve problems.

CULTURAL AND CIVIC ENGAGEMENT

Students will act purposefully, reflectively, and ethically in diverse and complex environments.

EFFECTIVE COMMUNICATION

Students will exchange ideas and information with clarity in multiple contexts.

INFORMATION LITERACY

Students will be able to recognize when information is needed and have the ability to locate, evaluate, and use it effectively.

INTEGRATING TECHNOLOGIES

Students will demonstrate fluency in the application and use of technologies in multiple contexts.

Student work from this class may be randomly selected and used anonymously for assessment of course, program, and/or institutional learning outcomes. For more information, please refer to the Dean of the appropriate School.

Student Learning Outcomes

Upon successful completion of the course, the student will be able to…

1. Explain different theories of cosmology and postulate possible different scenarios for the future of the known universe.
2. Exhibit an understanding of the properties of a "nested universe," in which our universe is only one of many in a higher-dimensional "multiverse." (Examples: hyperspace, quantum universes, infinite progression, etc.)
3. Describe General Relativity's application to our current understanding of the force of gravity, and Special Relativity's implications for travel near the speed of light, and the effects of these on time.
4. Explain the importance of the relation of matter and energy, implied in $E=mc^2$, in nuclear fusion and in acceleration of masses and the energy required to maintain it.
5. Define different types of black holes and their general and specific properties.
6. Define properties of anomalistic objects such as quasars, "white fountains" (theoretical opposites to black holes), and wormholes by applying knowledge of relativity and cosmology.
7. Explain theoretical and experiential evidence for and against current astronomical anomalies. (Examples: wormholes, hyperspace, superluminal and subluminal space travel, contact with other life in the universe.)