



VIRGINIA BEACH CITY PUBLIC SCHOOLS CHARTING THE COURSE

Department of Teaching & Learning Parent/Student Course Information

Astronomy (SC 4260) Online (SCO 260) One credit, one year Grades 10-12

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION

The Astronomy course is an in-depth study of the solar system, its sun and stars, the structure of the universe and the dynamic nature of the cosmos. The course includes investigations of the physical world, studies of new astronomical discoveries, hypotheses and conclusions regarding new and evolving ideas and key scientific principles of a vast universe. By emphasizing conceptual learning, investigation of historical and new discoveries and by utilizing technology, the student will gain powerful tools to assist in unlocking the secrets of the universe.

COURSE GOALS

- Apply knowledge of mathematics and science to the study of astronomy
- Analyze past, current and future manned space programs
- Use experimental design to develop and implement an investigation related to concepts in astronomy
- Integrate the use of technology in the process of problem solving
- Visit and discuss space exploration at local planetariums and museums
- Work in collaborative groups and use real-world management skills for decision-making and problem solving

PREREQUISITE

Earth Science or Environmental Science
Geometry

OPTIONS FOR NEXT COURSE

Physics (Geometry prerequisite)
Chemistry (Algebra II prerequisite or co-requisite)
Oceanography (Earth Science prerequisite)
Advanced Placement Environmental Science (Biology and Chemistry prerequisites)
Advanced Placement Biology (Biology and Chemistry prerequisites)
Advanced Placement Chemistry (Chemistry prerequisite)
Advanced Placement Physics 1 (Algebra II/Trigonometry corequisite)
Advanced Placement Physics C: Mechanics (Calculus corequisite)

MATERIALS

The teacher will use Gale in Context, an online resource database, as well as supplementary materials to teach, extend and enrich the students' understanding of course topics. These materials may be drawn from daily newspapers, periodicals, television and other visual media, primary source documents, simulations, computer programs and other online educational resources.

MINIMUM REQUIREMENTS

- Demonstrate knowledge and understanding of all core objectives through laboratory investigations, oral and written quizzes, tests, research and reports
- Participate in the core laboratory experiences and adhere to all safety procedures
- Prepare written reports for core laboratory experiences
- Read and share current literature on relevant topics
- Participate in student-centered investigations that combine scientific processes and knowledge with scientific reasoning and critical thinking
- Investigate, design and present a final research project that demonstrates the feasibility of living in space

The Knowledge, Skills and Attitudes that Comprise the Astronomy Course are summarized as follows from the prescribed curriculum:

- Demonstrate safe practices in the classroom, laboratory and field
- Identify the components of a laboratory activity
- Utilize different techniques to interpret and organize data
- Analyze the motions of the Earth around the Sun to the causation of days, years and seasons
- Explain the effects of the motions of the Earth/Moon/Sun system
- Identify the different components of the celestial sphere
- Identify the constellations and reasons for studying astronomy
- Investigate the historical contributions of individuals to the development of astronomy
- Explain the nature of light
- Relate the types of instruments which collect electromagnetic radiation
- Analyze the spectral emissions
- Explain the sun's basic properties
- Recognize how distance to stars is measured
- Compare apparent magnitude and absolute magnitude
- Relate the luminosity, temperature and mass of stars to determine the luminosity classification
- Recognize binary stars and their behaviors
- Explain the formation of stars
- Relate stellar evolution to the classification of stars
- Describe the death of stars
- Determine how neutron stars and black holes are formed
- Identify basic characteristics and properties of the Milky Way galaxy
- Explain the origin and morphology of the Milky Way galaxy
- Explain galaxies of the universe
- Describe peculiar galaxies and quasars
- Evaluate the principles of cosmology
- Describe the origin of the solar system
- Compare and contrast the Terrestrial and Jovian planets
- Appraise the moon as Earth's satellite
- Compare meteorites, asteroids, comets and Trans-Neptunian objects
- Recognize the principles that govern rocketry
- Summarize the history of space exploration
- Identify the major contributions of the space program
- Identify the major spin-offs from space exploration
- Justify continued exploration in space

CORE AREAS FOR LABORATORY EXPERIENCES

- Safety
- Laboratory procedures
- Use of instrumentation
- Data collection
- Charts/graphs/tables interpretation
- Building a telescope
- Scale model of sun, Earth and planets
- Determining the sun's altitude using a sundial
- The night sky
- Newton's Laws
- Spectrograph
- Using a telescope
- Distance by parallax
- Classification of galaxies
- Geology of the moon and planets
- Creating a model of a solar system

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Produced by the Department of Teaching and Learning.
For further information, please call (757) 263-1070.

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The School Division is committed to providing educational environments that are free of discrimination, harassment, and bullying. Students, staff, parents/guardians who have concerns about discrimination, harassment, or bullying should contact the school administration at their school. Promptly reporting concerns will allow the school to take appropriate actions to investigate and resolve issues. School Board Policy 5-7 addresses non-discrimination and anti-harassment, Policy 5-44 addresses sexual harassment and discrimination based on sex or gender. Policy 5-36 and its supporting regulations address other forms of harassment.

Alternative formats of this publication which may include taped, Braille, or large print materials are available upon request for individuals with disabilities. Call or write the Department of Teaching and Learning, Virginia Beach City Public Schools, 2512 George Mason Drive, P.O. Box 6038, Virginia Beach, VA 23456-0038. Telephone 263-1070 (voice); fax 263-1424; 263-1240 (TDD) or email him at Keith.Goodman@vbschools.com.

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