



GREAT NECK PUBLIC SCHOOLS

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Course Profile: Astronomy

<u>Department</u>	Science		
<u>Course Name</u>	High School Astronomy		
<u>Course Length</u>	1 Year		
<u>High School Credits</u>	1 unit of credit		
<u>Description</u>	This course is an introduction to the composition and structure of the universe. Astronomy is the scientific study of the contents of the entire Universe. This course will provide the student with a study of the universe and the conditions, properties, and motions of bodies in space. The content includes, but is not limited to, historical astronomy, astronomical instruments, the celestial sphere, the solar system, telescope use, the earth as a system in space, the earth/moon system, the sun as a star, and stars.		
<u>Target/eligible students</u>	10, 11, 12 grade students. Prerequisite: Earth Science		
<u>State Learning Standards Link(s)</u>	New York State P-12 Science Learning Standards -HS. Space Systems -HS. History of the Earth -HS. Earth's Systems -HS Waves and Electromagnetic radiation		pg. 9 pg. 20 pg. 22
<u>Primary texts and materials</u>	"Astronomy Today" Chaisson/McMillan sixth edition, Earth and Space.com , NASA.com , Earth Sky News		
<u>Scope/Sequence</u>	Standards/themes	Key Ideas, Term and Concepts	
<u>Unit 1: Introduction to the Field of Astronomy</u>	ETS 1B ETS 1C ESS 1A ESS1C	Student's will differentiate between Astronomy and Astrology. Where are we located in the Galaxy/Universe, discuss the main arguments and evidence in support of the standard cosmological model, where is the Earth located in the Universe and evaluate a comparison of our standard calendar and time measurements in relation to the night time sky.	
<u>Unit 2: Earth in Space</u>	HS-ESS1-4 HS-ESS-6 HS-PS2-4 HS-PS4-1 HS-PS2A HS-PS3C	Evaluation of the effects of the relative positions of the Earth, Moon, and Sun on an observable phenomenon. Latitude and time of year affect Earth Dynamics. Keeping track of time using celestial bodies and the position of the Earth. What is light? Why is the sun so hot and how does the electromagnetic radiation from the Sun affects the Earth?	pgs. 1-38 62-78
<u>Unit 3: Beyond the Earth</u>	HS-ESS1-4 HS-PS1C HS-PS2A HS-PS3B HS-PS3C HS-PS4A HS-ESS1-5 HS-ESS1-6	How old is the Earth? Comparison of planets and similarities to Earth. Geocentric and Heliocentric models. Criteria used to determine celestial objects as planets. Asteroids, meteorites and comets in relation to Earth and the formation of. What is Apophis and the Keyhole?	pgs. 38-61 142-165 198-355 360-385

<u>Unit 4: History of Astronomy</u>	HS-ESS1-4, HS-ESS1-5, HS-ESS1-6 HS-PS2A HS-PS2B HSPS3B HS-PS4A	Ancient civilizations view and understanding of the stars. Observations, theories, laws that influenced scientific thinking and encouraged the development of technology. Who were some of the most influential astronomers?	
<u>Unit 5: Methods of Observational Astronomy</u>	SAST1 HS-Ps2A HS-PS4-5 HS-PS2-4 HS-ESS1-4 HS-PS4C HS-ESS2D HS-ETS1A HS-ETS1B HS-ETS1C	How can we best view celestial objects? History of the telescope. Which objects will give a clearer view, comparison of various telescopes, refractive, reflective and types of mirrors used. Technological advances in telescope use. Instruction and use of telescopes. The role of technology encourages scientific advancement. Simple rocket construction and launch. Rocket dynamics and how they assist in space expiration.	pgs. 84-139
<u>Unit 6: Motions of Celestial objects, laws and gravity</u>	HS-ESS1-4 HS-PS2-4 HS-PS2A, HS-PS2B HS-ESS1A HS-ESS1B HS-ETS1B HS-ETS1C	Distance to the sun and seasons. Kepler's 3 laws used to determine a planets orbit speed and distance, to explain planetary motions. Compare gravity to microgravity. Discussion of inverse square law. Newton, Ptolemy and gravity.	pgs. 51-59
<u>Unit 7: Life Cycle of Stars</u>	HS-ESS1-2 HS-ESS1-3 HS-PS1-1 HS-PS1-8 HS-PS1C HS-PS3D HS-PS4B HS-ESS1A HS-ETS1B	Creation of stars and the life cycle of a star. Familiarization with the HR (Hertzsprung Russell) Diagram. Measuring star properties, and significance in the solar system and the universe. Star color in relation to temperature and evolution. Relationship between solar mass, size and the length of a star's life.	pgs. 414-551
<u>Unit 8: Big Bang, black holes and neutron stars</u>	HS-ESS1-1 HS-ESS1-2 HS-ESS1-3 HS-PS3A HS-PS2B HS-PS3C HS-PS4A HSPS4B HS-ESS1A	What is the Big Bang and how did the Universe begin? Galaxies in the universe and the Milky Way. Shape of various Galaxies, what shape is the Milky Way? How does the red shift apply to the idea that the universe is expanding? Formation of black holes and neutron stars. Hubble's law and the relationship to the red shift. Dark matter and the material around it and its existence.	pgs. 578-775
<u>Additional Notes</u>			