

ASTRONOMY	
Texts:	<p><u>Astronomy Today</u> 6<sup>th</sup> edition by Chaisson and McMillan, Pearson Addison-Wesley, 2008.</p> <p><u>Earth Science</u> by Tarbuck and Lutgens, Pearson Prentice Hall, 2009.</p>
Supplemental Materials:	Handouts, articles, videos provided by instructor during the semester
Course Description:	<p>Astronomy is a one semester course (1/2 Unit) which seeks to help students improve their understanding and appreciation for the night sky and the universe in which we live. This course examines the early ideas of ancient astronomers to modern observational techniques. Course work will include study of the night sky, cycles of the moon, light behavior, telescopes and spectroscopy and the historical moments in our country's space program. Emphasis will be placed on the importance of our sun, touring our solar system and studying what is beyond our solar system by examining the properties of stars, stellar evolution and other galaxies.</p>
Methods of Evaluation:	Evaluation is based primarily by tests, labs, vocabulary quizzes, projects, class work, homework assignments and notebook checks.
Pace of Instruction:	<p>Unit 1-The Night Sky and Early Astronomy</p> <p>Unit 2-Cycles of the Moon (Tides and Eclipses)</p> <p>Unit 3-Light, Telescopes and Spectroscopy</p> <p>Unit 4-NASA's Journey to the Moon</p> <p>Unit 5-The Sun-Our Star</p> <p>Unit 6-Touring Our Solar System</p> <p>Unit 7-Beyond Our Solar System</p> <p>Exam-Cumulative Final Exam</p>
Unit Objectives:	<p>At the end of the course, the students should be able to:</p> <p><u>Unit 1-The Night Sky and Early Astronomy</u></p> <ul style="list-style-type: none"> <li>• Define astronomy, the universe and astrology.</li> <li>• Give examples of light pollution astronomers face.</li> <li>• Distinguish between the common names and asterisms of URSA MAJOR and URSA MINOR.</li> <li>• Explain the concept of the celestial sphere and how we use right ascension and declination to locate objects on the celestial sphere.</li> <li>• Describe how and why the Sun and the stars appear to change their positions from night to night and from month to month.</li> <li>• Explain why Earth's rotation axis shifts slowly with time and say how it affects Earth's seasons.</li> <li>• Understand how to use overhead view and horizon view star maps to locate objects in the observer's night sky.</li> </ul>

<p>Unit Objectives:</p>	<ul style="list-style-type: none"> <li>• Explain what a constellation is and how they are useful for mapping the sky.</li> <li>• Explain how the geocentric model of the solar system differs from the heliocentric model.</li> <li>• Describe the accomplishments of early astronomers, specifically Aristotle, Bayer, Eratosthenes, Hipparchus, Ptolemy, Copernicus, Brahe, Kepler, Galileo, Newton, and Messier.</li> <li>• State Kepler's three laws of planetary motion.</li> </ul> <p><u>Unit 2-Cycles of the Moon (Tides and Eclipses)</u></p> <ul style="list-style-type: none"> <li>• Explain what causes the phases of the moon and earthshine.</li> <li>• Identify what percentage of the moon is always lit.</li> <li>• Identify and label the moon phases.</li> <li>• Distinguish between a sidereal period and a synodic period.</li> <li>• Show how the relative motions of Earth, the Sun and the Moon lead to eclipses (total and lunar) and why they rarely occur.</li> <li>• Explain what causes the moon to appear red during a lunar eclipse.</li> <li>• List the layers of the sun that are only visible during a total solar eclipse.</li> <li>• Describe how the moon's position causes an annular eclipse.</li> <li>• Identify and describe constellations ORION and DRACO.</li> <li>• Explain the role the moon has on the tides on earth and why high and low tides change each day by 50 minutes.</li> <li>• Describe the geometric alignment of the earth, moon and sun for neap and spring tides.</li> <li>• Compare and contrast the three tidal patterns: diurnal, semidiurnal and mixed.</li> </ul> <p><u>Unit 3-Light, Telescopes and Spectroscopy</u></p> <ul style="list-style-type: none"> <li>• Describe the major regions of the electromagnetic spectrum and explain how Earth's atmosphere affects our ability to make astronomical observations at different lengths.</li> <li>• Explain what astronomers learn about celestial objects by analyzing their spectra.</li> <li>• Describe the characteristics of continuous, emission and absorption spectra and the conditions under which each is produced.</li> <li>• Compare and contrast refracting and reflecting telescopes.</li> <li>• Explain the advantages of reflecting telescopes for astronomical use and why very large telescopes are needed for most astronomical studies.</li> <li>• Discuss the advantages and disadvantages of radio astronomy compared with optical observations.</li> <li>• Explain how interferometry can enhance the usefulness of astronomical observations.</li> </ul>
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<p>Unit Objectives:</p>	<ul style="list-style-type: none"> <li>• Explain why some astronomical observations are best done from space.</li> <li>• Describe what the following telescopes study: Green Bank, Arecibo, Hubble, Chandra, Compton and James Webb.</li> <li>• Decide what telescope projects should be funded based on given information.</li> <li>• Identify and describe CONSTELLATIONS PISCES and ANDROMEDA.</li> </ul> <p><u>Unit 4-NASA’s Journey to the Moon</u></p> <ul style="list-style-type: none"> <li>• Summarize the leading theory of the formation of the moon.</li> <li>• List in the correct order the 4 main stages of planetary evolution.</li> <li>• Describe the processes that created the surface features of the moon.</li> <li>• Identify the topographical features on the near side vs. far side moon.</li> <li>• Explain how observations of cratering can be used to estimate the age of a celestial body’s surface.</li> <li>• Explain the relationship between the United States and the USSR in the 1950’s.</li> <li>• Know how Werner von Braun, Yuri Gagarin, Alan Shepard, Alexi Leonov, Ed White &amp; Harrison Schmitt contributed to modern space travel.</li> <li>• Know the goals and milestones of the Project Mercury, Project Gemini, Project Apollo, Skylab, Apollo-Soyuz and the ISS.</li> <li>• Describe the era of the Space Shuttle.</li> </ul> <p><u>Unit 5-The Sun-Our Star</u></p> <ul style="list-style-type: none"> <li>• Summarize the overall properties and internal structure of the Sun.</li> <li>• List and describe the outer layers of the Sun</li> <li>• Outline the process by which energy is produced in the Sun’s interior.</li> <li>• Discuss the nature and variability of the Sun’s magnetic field.</li> <li>• Describe the Sun’s sunspot cycle.</li> <li>• Describe the discoveries of Heinrich Schwabe, George Hale and E. Walter Maunder.</li> </ul> <p><u>Unit 6-Touring Our Solar System</u></p> <ul style="list-style-type: none"> <li>• Summarize the basic differences between the terrestrial planets and the Jovian planets.</li> <li>• Identify the distinguishing characteristics of each planet.</li> <li>• Explain why Pluto is no longer considered a planet.</li> <li>• Identify and describe the major non-planetary components of our solar system like asteroids, comets and meteoroids.</li> </ul>
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Unit Objectives:	<u>Unit 7-Beyond Our Solar System</u> <ul style="list-style-type: none"><li>• Explain how distance affects parallax.</li><li>• Explain what we can learn by studying star properties.</li><li>• Distinguish between luminosity and apparent brightness and explain how stellar luminosity is determined.</li><li>• Identify the factors which determine a star's apparent magnitude.</li><li>• Describe how a Hertzsprung-Russell diagram is constructed and used to identify stellar properties.</li><li>• Summarize the sequence of events leading to the formation of a star like our Sun.</li><li>• Describe the overall structure of the Milky Way Galaxy.</li><li>• Describe the basic properties of normal galaxies.</li></ul>
	Date Completed: 23 March 2012