

**Astronomy**  
**CTY Course Syllabus**

Text: *Astronomy: A Beginner's Guide to the Universe*

Authors: Chaisson/McMillian

<b>Day</b>	<b>Time</b>	<b>Content</b>	<b>Activities</b>
Day 1 – Monday	Morning	The Motions of the Planets, The Birth of Modern Astronomy	Go over syllabus, Ice-Breaker Activities, Take Pre-Test
	Afternoon		Lab: Mathematical Tools
	Evening		Read Ch. 5 & E.5, Motions of the Stars Workbook Activity
Day 2 – Tuesday	Morning	Properties of the Earth and Moon (including tides, atmospheres, interiors, surfaces, magnetospheres), History of Earth-Moon System, The Motions of the Moon	Moon Slide Show, Survivor on the Moon
	Afternoon		Lab: The Moon and its Phases
	Evening		Read 1.3, 1.4, 8.1, Observing Moon from Telescope
Day 3 – Wednesday	Morning	Kepler's Laws of Planetary Motion, Newton's Laws, The Galilean Moons of Jupiter	Jupiter Slide Show, Derivation of Kepler's Third Law, Kepler's Laws and Newton's Laws Worksheets
	Afternoon		Lab: The Moons of Jupiter
	Evening		Read Chapter 2, Observing Jupiter and Galilean Moons

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Day 4 – Thursday	Morning  Afternoon  Evening	Electromagnetic Spectrum, Thermal Radiation (Blackbody Radiation, Wein's Law, Stefan's Law), Spectroscopy, Formation of Spectral Lines	Speed of Light Math Problems, Blackbody Worksheet, Color Analyzer Activity  Lab: Spectroscopy  Read Chapter 4, Planetary Formation Presentation
Day 5 – Friday	Morning  Afternoon  Evening	Inventory of the Solar System, Solar System Debris (Asteroids, Comets, Meteoroids), Formation of the Solar System, Exoplanets	Solar System Slide Show, Assign Planets, Cookin' Up a Comet Demonstration  Research Planets & Make Posters  Finish Up Posters, Prepare Present.'s, Read 8.4 – 8.6
Sunday, Study Hall	Evening		
Day 6 – Monday	Morning  Afternoon  Evening	Planetary Rings and their Formation, Roche Limit, Is Pluto a Planet?	Derivation of the Roche Limit, Make a Grapefruit Saturn, Open Discussion: Why isn't Pluto a Planet?  Presentation of Planet Posters  Read Ch. 9 & E.4, Astronomical Lecture

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Day 7 – Tuesday	Morning  Afternoon  Evening	<b>Field Trip: National Air and Space Museum, Washington, D.C.</b>  Depart: 9:00 am  Return: 8:30 pm	
Day 8 – Wednesday	Morning  Afternoon  Evening	Properties of the Sun (Interior, Atmosphere, Sunspots, Nuclear Fusion), Stellar Parallax	Discussion of Hydrogen Fusion, Sun Spotter Activity  Lab: Stellar Parallax  Read Chapter 10, Flux and Luminosity Math Problems
Day 9 – Thursday	Morning  Afternoon  Evening	Star Measurements (Stellar Parallax, Luminosity, Apparent Brightness, Stellar Sizes and Temperatures)	Calculating Apparent and Absolute Magnitudes  Lab: Inverse-Square Law of Light  Read Chapter 11, Stellar Nebula Volume/Mass/Density Math Problems

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Day 10 – Friday	Morning	Hertzsprung-Russell Diagram, Different Types of Stars (Main Sequence, White Dwarfs, Red Giants, etc.), Spectroscopic Parallax and the Cosmic Distance Scale, Determining Stellar Masses, Interstellar Matter, Star Formation	Plot Several Stars to Make a Massive H-R Diagram on Black Board, Fill in Stellar Evolution Chart
Sunday, Study Hall	Afternoon		Lab: The H-R Diagram
	Evening		Read Ch. 14 & 13.5, Galaxy Distance Math Problems
Day 11 – Monday	Morning	Milky Way Galaxy, Variable Stars, Galactic Structure, Formation of the Milky Way, Dark Matter, Center of Milky Way (Black Holes)	Special Relativity Readings from <i>How to Build a Time Machine</i> , Dark Matter Essay, Calculate Escape Velocity of Black Hole
	Afternoon		Lab: The Milky Way Galaxy
	Evening		Read Chapter 17 Review Math Prob.'s
Day 12 – Tuesday	Morning	Cosmology, Redshift, Fate of the Universe, Inflation	Tour of Space Telescope Institute, Final Exam Review
	Afternoon		Lab: The Distance Ladder
	Evening		Read Chapter 18 Discussion about Fate of the Universe
Day 13 Wednesday	Morning	Life in the Universe, Astrobiology	FUSE Tour, Magnetars Essay, Final Exam Review
	Afternoon		Lab: Search for Extraterrestrial Life
	Evening		<b>Final Exam</b>

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Day 14 – Thursday	Morning	<b>Field Trip: Maryland Science Center and Davis Planetarium</b>	
	Afternoon	Depart: 9:00 am, Return: 3:00 pm	
	Evening	Farewell Activities	
Day 15 – Friday	Morning	Wrap-Up, Review Final Exam, Movie	
	Afternoon	Depart for Home	