

Astronomy Course Syllabus

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

Authors: Chaisson/McMillian

| Day | Time | Content | Activities |
|-------------------|-------------|---|--|
| 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 | Field Trip: National Air and Space Museum, Washington, D.C. 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 | | Final Exam |

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| Day 14 – Thursday | Morning | Field Trip: Maryland Science Center and Davis Planetarium | |
| | 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 | |