

SSHS Astronomy – Course Outline

Unit 1 - Essentials I – Scientific Process

1. Subject - Scientific processes, history, astrology, what astronomers do (Pt_1)
2. Tour of the Universe PPT
3. Lab – Tools for success, math skills (from lab manual), Take home questions
4. Lab – Scale Model Lab (my copy)
5. Video
 - a. YouTube clip “Distances in Space”
 - b. Journey to the Edge of the Universe (1:30)
6. Powerpoint – Ch02
7. Discussion – (End of Chapter “What do you think?” page 10) – 1,2,3
8. Assignment – Review Questions 1,2,3 (end of Essentials I, page 10)
9. Unit 1 Quiz

Unit 2 – Discovering the Night Sky

1. Subject – The night sky, seasons (Ch-01)
2. Powerpoint – Ch01
3. Stellarium, Night observations lab (Night sky app), two sessions (Fall, Winter)
4. Video: How the Universe Works – Big Bang
5. Lab – Phases of the moon (optional), Take home questions
6. Discussion – (End of Chapter – 55,56,57)
7. Assignment – Review Questions (page 38) – 1,4,5,6,7,8,10,11,12,13,14
8. Unit 2 Quiz including Constellation Quiz

Unit 3 – Gravitation and the Waltz of the Planets

1. Subject – Gravity, geocentric vs. heliocentric orbits, planetary orbits, Newton’s laws (Ch-02)
2. Powerpoint – Ch03
3. Youtube: Newton’s Law, Newton’s best idea ever
4. Lab – The Orbit of Mercury, Take home questions
5. Video – Into the Universe “The Story of Everything”
6. Discussion – (page 61) – 21,22,23,24 and “What did you know” page 60
7. Assignment – Review Questions (page 61) – 1,2,3,4,5,6,9
8. Unit 3 Quiz

Unit 4 – Light and Telescopes

1. Subject – The nature of light, the electromagnetic spectrum, the structure of atoms, telescopes (Ch-03, Ch-04)
2. Powerpoint – Ch04 and Ch05
3. Lab – Finding the speed of light with marshmallows
(<http://www.physics.umd.edu/icpe/newsletters/n34/marshmal.htm>) - Do this at home
4. Video – Nova: Hunting the Edge of Space (<http://video.pbs.org/video/1456686369/>) – Part 1
5. Video – Nova: Hunting the Edge of Space (<http://video.pbs.org/video/1463392610/>) – Part 2
6. Discussion – (Last page in chapter “What if humans could see infrared”), “What do you think?” (page 90 in Ch-03)
7. Discussion – “What did you know on Page 110 in Ch-04. Discussion questions 16 & 17 (Page 112)
8. Assignment – Students are to create drawings of every type of telescope, with all parts labeled
9. Assignment – Review Questions (page 111) - 1-9
10. Unit 4 Quiz

MIDTERM EXAM REVIEW

MIDTERM EXAM (Units 1 through 4)

Unit 5 - Essentials II – Essentials for Understanding the Solar System

1. Subject – Formation of the solar system and the planets (Pt_2)
2. Powerpoint – Ch08
3. YouTube Video – “Solar System Formation”
4. Bill Nye - AstroBiology
5. Video – “How the Universe Works”: Alien Solar Systems
6. Discussion – “What did you think” Page 129
7. Assignment – “What if” (Page 130) Questions 7-10
8. Planet group projects begin, handout
9. Unit 5 Quiz

Unit 6 – The Earth and Moon (should be November)

1. Subject – The Environments of the Earth, the Earth’s magnetic field, the formation of the Moon (Chap-05-1)
2. Powerpoint – Ch06 and Ch07
3. Lab – Density of the Earth, Take home questions
4. YouTube – Earth’s Magnetic Field
5. Moon app
6. National Geographic - Aurora
7. Video – Stephen Hawking – “Aliens”
8. Discussion – “What did you know” Page 155 Questions 1-6
9. Discussion – Discussion Questions Page 158 Questions 32-42
10. Assignment – Review Questions (Page 157) 1-21 excluding 5,6,11,16
11. Unit 6 Quiz

Unit 7 – The Other Terrestrial Planets

1. Subject – Mercury, Venus, and Mars (Chap-06),
2. Mars app
3. Powerpoint – Ch09
4. YouTube – Venus (aggMan UK)
5. Lab – Terrestrial Planet Lab (new)
6. Video – “How the Universe Works”: Extreme Planets
7. Discussion – “What did you know” Page 184-85 Questions 1-5
8. Discussion – Discussion Questions Page 187 Questions 31-30
9. Assignment – Review Questions (Page 186) - 1,2,7,8,9,11,13,20,22
10. Unit 7 Quiz

Unit 8 – The Outer Planets

1. Subject – Jupiter, Saturn, Uranus, Neptune, Pluto (Chap-07)
2. Powerpoint – Ch10
3. Lab – Jovian Planets
4. Video - “How the Universe Works”: Alien Moons
5. Discussion – “What did you know” Page 217 Questions 1-5
6. Discussion – Discussion Questions Page 220 Questions 32-40
7. Assignment – Review Questions (Page 291) - 6,9,10,14,15,17,21
8. Unit 8 Quiz

Unit 9 – Vagabonds of the Solar System

1. Subject – Meteors, Comets, Asteroids (Chap-08)
2. Powerpoint – Ch11
3. NGC – Killer Asteroid
4. Discussion – “What did you know” Page 244 Questions 1-5
5. Discussion – Discussion Questions Page 246 Questions 22-27
6. Assignment – Review Questions (Page 245) – 1,2,4,5,6,7,8
7. Unit 9 Quiz

Unit 10 – All about Stars

1. Basic properties of stars, our Sun, the formation of stars and planets, evolution of stars, white dwarfs, neutron stars, black holes
2. Powerpoint – Ch12 through Ch15
3. Lab – Need a new sun lab
4. Lab – An eclipsing extrasolar planet, Take home questions (optional)
5. Spacerip
6. Optional Activity – Make a sundial (from ck-12.org Physics book)
7. Video – “Stephen Hawking: Time Travel”
8. Video – “How the Universe Works”: Extreme Stars
9. Video – “How the Universe Works”: Black Holes
10. Unit 10 Quiz

Unit 11 – Galaxies and Cosmology

1. The Milky Way Galaxy, galaxies, Cosmology
2. Powerpoint – Ch16 through Ch18
3. Video – “How the Universe Works”: Alien Galaxies
4. Unit 11 Quiz

FINAL EXAM REVIEW

FINAL EXAM (Comprehensive)