Outline of Course Material (Keyed to the Textbook)

Chapter 1 Observing the Sky: The Birth of Astronomy
1-1 The Sky Above: Read carefully and know all boldface terms. How does the sky change if you are at the north or south pole? How does it change if you are at the equator? Describe the motion of the sun over the course of a year. What is the connection between the zodiac and the ecliptic?
1-2 Ancient Astronomy: Hipparchus, Eratosthenes, and Ptolemy are the most important people mentioned here. Read carefully and know the boldface terms. What are the main effects of the Earth's precession? How long does it take to complete a cycle of the precession? What is retrograde motion? Where are the planets involved when the retrograde motion is going on? Why did Ptolemy need epicycles?
1-3 Astrology and Astronomy: Omit
1-4 The Birth of Modern Astronomy: Read for information. The two main things here are Copernicus and the heliocentric system and Galileo's observations of the phases of Venus. Sketch the position of Venus in its orbit and the phases at these points as seen from Earth. Why is Venus never far from the Sun?

Chapter 3 Earth, Moon, and Sky
3-1 Earth and Sky: Read for information.
3-2 The Seasons: Read carefully and know all italicized terms. Figures 3.4 and 3.6 show the effect of the revolution of the Earth around the Sun on the apparent daily path of the Sun. Can you draw and explain figures 3.4 and 3.6 if asked? What is the connection between the celestial equator and the ecliptic on the solstices and the equinoxes? Why do we see the Summer constellations in Summer and not in Winter? Why is July hot in the Northern Hemisphere?
3-3 Keeping Time: The main point here is the difference between the sidereal and solar day. The apparent solar, mean solar, and standard time discussions are worth reading. Why is an hour of time equivalent to 15 degrees? Why is the sidereal day 4 minutes shorter than the solar day? Can you draw and explain figure 3.9?
3-4 The Calendar: Omit
3-5 The Phases and Motion of the Moon: Understand the cycle of the phases. When does each phase occur in the cycle? Where is the Moon in the sky at that phase. How long is it between different phases? How fast in degrees a day does the Moon move in its orbit? Why is there a difference between the synodic and sidereal months. Can you explain the difference?
3-6 Ocean Tides and the Moon: Omit
3-7 Eclipses of the Sun and Moon: Read carefully and know all boldface terms. What are the phases of the Moon at a solar and a lunar eclipse? What don't we have a solar eclipse at each new moon? How does the tilt of the Moon's orbit affect the possibility of eclipses?
Chapter 2 **Orbits and Gravity**

2-1 Read carefully and know the boldface terms. Be especially careful and know Kepler's Laws. Try doing problems 18 through 20 at the end of the chapter.

2-2 Newton's Great Synthesis: Read for information but not relevant immediately.

2-3 Universal Gravity: Read for definition of the force law and the definition of the acceleration of gravity. What does the inverse square law predict for the acceleration of gravity at the surface of the Earth? For a point at twice this distance from the center of the Earth? At the Moon's orbit?

2-4 Orbits in the Solar System: Read for information

2-5 Motions of Satellites and Spacecraft: Read for information

2-6 Gravitation with More Than Two Bodies: Omit

Chapter 4 **Light**

4-1 The Nature of Light: Read carefully and know the boldface terms. What are the properties of a wave. Given the frequency can you find the wavelength of a light wave. Vice Versa? What is a photon? What is its energy proportional to?

4-2 The Electromagnetic Spectrum: Read carefully and know the boldface terms. Know the radiation laws for a blackbody and both Wien's Law and the Stefan-Boltzmann Law. Do problems 20, 21, and 22 at the end of the chapter.

4-3 Spectroscopy in Astronomy: Read carefully and know the boldface terms. The italicized terms are important too.

4-4 The Structure of the Atom: The Atomic Nucleus and The Bohr Atom are the relevant subsections. Skip Rutherford. Where is the nucleus in an atom? Where are the electrons in an atom? What is the difference between two isotopes of the same element? What defines atomic number?

4-5 The Formation of Spectral Lines: The main thing here is the connection between energy levels and the absorption and emission process. Figure 4.18 should be studied. How is an excited state different from a ground state? When will an atom absorb a photon? When will an atom emit a photon? Why are emission and absorption inverse processes from one another?

------------------------------------------------------------------Test #1--------

Comments and study tips:

Read over the sections outlined above and make your own outline of the material. Try drawing the diagrams in the book until you understand each part. It is tempting to look at a diagram or read over a section without making notes, but it is too easy to get it confused when you need it on the test. Do the ground work before the test, not during the test. Good Luck!