I. Introduction and Historical Background
   What is astronomy
   Ancient astronomy
   Geocentric model – Ptolemy
   Heliocentric model – Copernicus
   Tycho Brahe
   Kepler – Kepler’s 3 Laws
   Galileo – observations vs. geocentric model
   Newton – law of gravity, laws of motion
   Orbital motion – why?

II. The Night Sky
    The Earth in space – rotation on axis
    revolution about sun
    tilt of axis and origin of seasons
    Celestial Sphere
    ecliptic
    celestial equator
    celestial poles
    solstices, equinoxes
    Precession
    Solar vs. sidereal time
    orbit of moon, phases
    eclipses of Sun & Moon – Why?

III. Electromagnetic radiation, optics, and telescopes
     EM spectrum
     wavelength, frequency, velocity of light
     inverse square law
     Doppler effect
     Optics – formation of an image
     refraction & reflection

     Telescopes – optical and radio
     atmospheric windows

IV. Solar System
    membership
    formation
    extrasolar planets
    Terrestrial planets
Earth – plate tectonics
Moon – surface, ages, origin

atmospheres – origin, greenhouse effect

Mercury, Venus, Mars – surface condition
evidence for water

giant planets and their satellites
   Jupiter – atmosphere, composition
      4 Galilean satellites/terrestrial
   Saturn – rings, Roche limit, Titan
   Uranus & Neptune – atmosphere

Pluto & trans-Neptunian objects/Kuiper Belt – dwarf planets
   No longer a major planet – why?

V. Interplanetary material
   Asteroids – asteroid belt
   Comets – composition, orbits, tail & nucleus
      Halley’s comet
   Meteors & meteor showers

Role of impacts – K-T event
   Tunguska
   Comet Shoemaker – Levy 9