GEOL 1312 -- Principles of Earth Science II
Study Guide
Midterm Exam 2

The midterm exam will be comprehensive and multiple-choice. This review sheet is a guideline only – there may be a few questions on the exam not specifically addressed here but covered in class, the assigned reading, or the homework.

Things to help you study:

Class notes
Homework assignments
Assigned reading
Animations posted on the web
This Study Guide
Practice Exam

General Astronomy Topics

- Where are we in the universe?
- Historical Astronomers: Ptolemy, Copernicus, Galileo, Kepler
- Electromagnetic waves (light): how do we use light to look at universe?
- Optical vs. radio telescopes

Solar System

- Basics about the planets: names, size, inner (rocky) vs. outer (gas) planets
- Standard model – what is it?
- How do the planets relate to one another? What do they have in common?

Celestial Motions

- Seasons – what causes them? Why does the northern hemisphere experience different seasons at different times of the year compared to the southern hemisphere?
- Eclipses – solar, lunar

The Moon

- Exploration: important missions
- Lunar samples: what can they tell us?
- Rotation and orbit periods, how are they linked?
- Why do we see the same side of the Moon?
- Geography – highlands, maria, near side/far side differences
- Craters - formation, characteristics, how do we use them to establish relative ages of regions?
- Formation and evolution of the Moon

Mercury

- Exploration: Mariner 10, Messenger
- Magnetic field observations and possible origin of magnetic field

Venus

- Exploration: Magellan, when, types of data set (radar, topography, etc.)
- Rotation, orbit (day vs. year)
- Atmosphere (composition) and surface conditions (temperature, pressure)
- Earth and Venus - similarities and differences in basic properties, processes
- Venus surface features: volcanoes, craters
- Craters: implications for surface age

Mars

- Exploration: Pathfinder, MERs
- General geography (names of major features), north vs. south hemisphere differences
- Moons
- Olympus Mons, Tharsis, Valles Marineris – what are they?
- Evidence for past water

Jupiter

- Exploration: Galileo, Voyager, etc.
- Internal structure, molecular vs. metallic hydrogen
- Magnetic field: source, size
- Great Red Spot
- Atmospheric features (clouds, belts)
- Rings

Jovian (Galilean) Satellites

- Tidal heating: what is it, which moons are most impacted by it?
- Magnetic field (which ones?)
- Volcanism (which one?)
- Possibility for life (which one?)
- Surface ages (which ones are "old", which are "young"?)
- Important characteristics of each

Saturn

- Composition (like which other planet?)
- Low density
- Rings – names, overall composition, characteristics
- Moons – are they all the same?
- Titan – why are we interested in it? (what is special about it?)
- Cassini-Huygens Mission (flybys + surface probe)

Neptune, Uranus, Pluto

- Compositions, density, reason for color
- Discovery of each
- Rings: how many, characteristics
- Uranus's odd rotation
- Neptune's active atmosphere: white spot, clouds
- Magnetic fields?
- Pluto: pros & cons for 'planet' status