**Discussion 0**

1. (4 pts) Introduce yourself to the class. Please share your name, year in school, hometown, major, and expectations for this course.
2. (5 pts) After watching the video, how has your understanding of geography as a discipline changed? Share your thoughts on the content.
3. (6 pts) After viewing the *Geospatial Revolution* video, identify five real-world applications of geospatial technology. For each one, describe how it works in 2–3 sentences.

**Discussion 1**

1. (3 pts) Define geography and physical geography. Then explain what spatial analysis means.
2. (2 pts) Briefly summarize the scientific method.
3. (4 pts) What is the difference between an open and a closed system? Provide an example of an open system.
4. (2 pts) What and where is the Prime Meridian?
5. (1 pt) What is meant by map scale?
6. (3 pts) List the three main geoscience tools introduced in this lesson.

**Discussion 2**

1. (4 pts) Describe Earth’s rotation and revolution. How are they different?
2. (4 pts) As you move away from the equator, how does the amount of insolation received by Earth's surface change? What role does this play in causing the seasons?
3. (5 pts) List the five key reasons Earth experiences seasons.
4. (2 pts) If Earth were flat and perpendicular to incoming solar radiation, how would solar energy be distributed across latitudes at the top of the atmosphere?

**Discussion 3**

1. (3 pts) Why does air pressure decrease with increasing altitude?
2. (3 pts) How does temperature change in the troposphere, and at what rate?
3. (2 pts) What is the main function of the ionosphere?
4. (5 pts) Why is ozone in the stratosphere important? Explain how chlorofluorocarbons (CFCs) contribute to ozone depletion.
5. (2 pts) Think critically: If you could survive without a spacesuit, would you feel hot or cold in the thermosphere? Explain your reasoning.

**Discussion 4**

1. (3 pts) What causes the blue color of the lower atmosphere?
2. (6 pts) How is the atmosphere’s greenhouse effect similar to and different from an actual greenhouse?
3. (6 pts) How do temperatures in cities compare to those in surrounding rural areas? List three reasons for this difference.

**Discussion 5**

1. (2 pts) As summer temperatures rise in deserts of the U.S. Southwest, how does barometric pressure change over the land?
2. (3 pts) How does the spacing of isobars on a weather map relate to wind speed?
3. (5 pts) At what latitude is the Intertropical Convergence Zone (ITCZ) located? Does it stay in the same place year-round? Explain your answer.
4. (5 pts) What causes the difference in precipitation between dry and rainy seasons?

**Discussion 6**

1. (4 pts) How does the daily pattern of relative humidity compare to the daily pattern of air temperature?
2. (3 pts) An unsaturated air parcel at 25°C (77°F) rises from sea level. If it cools at the dry adiabatic rate (DAR), what is its temperature at 1500 m (4921 ft)? Show your work.
3. (4 pts) Describe the behavior of stable and unstable air parcels when lifted vertically in the atmosphere.
4. (4 pts) Is cloud cover generally greater over oceans or land? What factors influence this pattern?

**Discussion 7**

1. (6 pts) What happens to air as it moves over a mountain range? Describe the resulting precipitation patterns on both windward and leeward sides.
2. (6 pts) In your own words, summarize the life cycle of a midlatitude cyclone.
3. (3 pts) What fuels the “engine” of a midlatitude cyclone, and how is this heat released?

**Discussion 8**

1. (6 pts) What is potential evapotranspiration? How is this potential rate estimated?
2. (5 pts) How does groundwater become polluted? Can contaminated groundwater be cleaned up easily?
3. (4 pts) When does groundwater use become groundwater mining?

**Discussion 9**

1. (3 pts) Which of the major climate types covers the largest land area on Earth?
2. (5 pts) Why are dry climates found in Northern Africa?
3. (7 pts) Compare precipitation patterns in humid subtropical (hot-summer) and Mediterranean (dry-summer) climates.

**Discussion 10**

1. (2 pts) What evidence supports the theory of continental drift?
2. (5 pts) What is plate tectonics? Name the three types of tectonic plate boundaries and briefly describe each.
3. (4 pts) Identify four tectonic settings where volcanic activity is common.
4. (2 pts) What is a subduction zone and how does it form?
5. (2 pts) What causes an earthquake?

**Discussion 11**

1. (8 pts) Compare alpine glaciers, ice sheets, ice caps, and ice fields. Which types are found in mountains, and which ones cover Greenland and Antarctica?
2. (4 pts) What is glacial mass balance? Identify its basic inputs and outputs.
3. (3 pts) Compare the accumulation and ablation zones of a glacier. How are they alike? How do they differ?

**Discussion 12**

1. (6 pts) What is a biome? On what basis are biomes classified?
2. (4 pts) In which biome are the world’s tallest trees found? Which biome is dominated by short plants, lichens, and mosses?
3. (5 pts) What kind of vegetation is typical of Mediterranean dry-summer climates? What adaptations help these plants survive?