

Review for First Hazards Test

Exam will cover Chapters 1-4 in the textbook.

Be sure you know all of the key terms, including:

- 1) hazard, disaster, catastrophe, cyclic event, land use planning, mitigation, precursor event, recurrence intervals.
- 2) lithosphere, asthenosphere, convergent/divergent/transform plate boundaries, plates, isostasy, hotspot volcanoes, plumes, mid-oceanic ridge, plate tectonics, rift zones, seafloor spreading, subduction zones, trenches
- 3) acceleration, amplitude/frequency/period/wavelength, blind thrust, body waves, creep, elastic rebound theory (stick-slip), epicenter/hypocenter/focus, fault, liquefaction, Mercalli Intensity Scale, Richter Magnitude scale, moment magnitude, three fault types, three seismic wave types, seismograms, seismographs, stress/strain, surface rupture length, displacement
- 4) base isolation, foreshocks, migrating earthquakes, paleoseismology, recurrence interval, retrofitting, seismic gaps

Chapter 1 key topics:

Understand the difference between cyclic and recurring events

Understand probabilities, and the coinflip/roulette analogy

Know why logarithmic plots are used

$M \sim 1/f$

Understand the relationships between various events, as in Fig. 1-7

Various ways of mitigating events:

- Land use planning
- Insurance
- Government oversight
- Public education

Read the "Living with Nature" section on p. 10

Questions for review (p. 11): 2, 3, 4, 5, 6, 9

Chapter 2 key topics:

Know the basic evidence supporting plate tectonic theory

Earth structure: Core-Asthenosphere-Lithosphere.

The Crust and Mantle are a different classification based on composition:

The Lithosphere contains both crust and mantle

The Asthenosphere is all mantle

Density is key for understanding why the ocean is shallower in some parts and why the continents are higher than the oceans

Three types of plate boundaries and examples of each

What hazards are found at each of the plate boundary types?

Hotspot volcanoes are not found at plate boundaries. They are related to plumes in the mantle: Hawaii and Yellowstone are two good examples.

Questions for review (p. 31): 1, 2, 4, 5, 6, 7, 8, 9

Chapter 3 key topics:

Know the three main fault types and which way the rocks are moving along faults

Know the elastic rebound theory: Stress/strain

Offset along faults is displacement

Surface rupture length

Relationship between fault type and tectonic plate boundary

What are intraplate earthquakes?

Know the three types of seismic waves

Ground shaking is recorded on a seismogram generated by a seismograph

How do you find the location of an earthquake using seismic waves?

Earthquake size is measured by intensity (Mercalli scale) or amount of shaking (Richter) or energy released (Moment Magnitude scale).

Ground acceleration as a % of g

Shaking is related to the geology: Loose soil shakes more than solid bedrock

$M \sim 1/f$ for earthquakes: How many magnitude 7 quakes annually?

Secondary effects: liquefaction, surface rupture, landslides

Questions for review (p. 60): 1, 2, 3, 4, 5, 6, 8, 9, 11, 12

Chapter 4 key topics:

Predicting quakes using precursors

What precursors are there?

Probability of an earthquake along a specific fault

Paleoseismology is used to determine recurrence intervals

Migration of earthquakes along a fault: Turkey example

What are seismic gaps?

How can we minimize structural damage in an earthquake?

Read through the various case in point studies and learn from the past

Questions for review (p. 96): 1, 2, 3, 5, 6, 7, 9, 10

SAMPLE EXAM QUESTIONS

Part 1: Definitions. Define each of the following terms (2 pts. each)

Lithosphere

Disaster

Hazard

normal fault

Part 2: Short Answer.

Explain the differences between a cyclic event and a recurring event. Give real-world examples of both.