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## Geol 250 – Exam Two

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The exam will use a pyramid testing technique and will consist of two parts: an individual exam and a group discussion exam. The individual exam will consist of 25 two-point questions and 5 five-point questions (total=75 points). The group discussion exam will consist of 25 one-point questions taken from the individual test (total=25 points). A discussion group may not contain more than 4 students. If you finish your individual exam before other students, please sit quietly and wait for the second part of the exam; do NOT take out any other material or communicate with other students.

No notes, electronic devices or any other material may be taken out during the class meeting during which the exam is administered. If your cell phone or other electronic device goes off (i.e., makes noise) during any part of the exam, your exam will be collected and you will be asked to leave. If you are observed handling anything other than a writing utensil and your exam papers (e.g., electronic devices, folders, bags, etc.), your exam will be confiscated and you will be asked to leave. You may not communicate in any way with other students during the individual exam time. Further actions are at the discretion of the professor.

### Topics Covered:

There will be three metric conversion questions. Please see the example test questions document for examples.

One of the five point questions on this exam will be: Briefly explain how the “Greenhouse Effect” keeps the Earth’s troposphere warmer than it would be if there were no “Greenhouse gases.”

**Earth’s Atmosphere:** composition of dry air, nitrogen, oxygen, argon, carbon dioxide, ozone; water vapor, aerosols; atmospheric heating: solar radiation, reflected, refracted and scattered radiation; solar energy budget, absorbed versus reflected and/or scattered radiation; temperature structure of the atmosphere, thermosphere, mesosphere, stratosphere, troposphere (main source of heat for the troposphere, general structure of the troposphere); greenhouse effect, short wavelength and long wavelength radiation and the greenhouse effect, carbon dioxide gas in the atmosphere, the carbon cycle, non-atmospheric carbon and the greenhouse effect, carbon dioxide emissions from fossil fuels and enhanced global warming.

**Weather I:** phases of water (solid, liquid, gas), phase changes, latent heat, evaporation, sublimation, deposition, freezing, condensation, melting; humidity, “absolute” humidity, relative humidity, saturation, dew point temperature; clouds, conditions favoring cloud formation (warm moist air, low pressure, aerosols); adiabatic cooling, orographic lifting, frontal wedging, local convection, stable versus unstable air; atmospheric pressure, air flow, low pressure systems (cyclones), high pressure systems (anti-cyclones), rotation within air masses; fronts, warm fronts, cold fronts, weather associated with cold fronts and warm fronts.

**Weather II:** predicting severe weather, unstable air, thunderstorms: lightning, thunder, hail, tornadoes, single cells, squall lines, supercells, lightning hazards, tornado hazards; tropical cyclones versus mid-latitude cyclones, tropical depressions, tropical storms, hurricanes, hurricane eye, eye wall, rain bands, conditions needed to form and maintain a hurricane.

**Hydrology:** the water cycle, evaporation (energy provided by solar heating), precipitation (energy provided by force of gravity), transpiration, runoff; water reserves, freshwater reserves (ice, surface water, groundwater), salt water versus freshwater; streams, drainage basins, sediment transport, suspended load, dissolved load, bed load; braided streams, meandering streams, point bars, cutbanks, meanders, oxbow lakes; flooding, flood plain, natural levee, stream budget, flood recurrence interval, stream discharge.