# ***STUDY GUIDE FOR FINAL\_\_\_\_* *\_\_\_\_\_\_\_\_\_\_\_\_\_ GEOL 303***

***NOTE: This is not an exhaustive list. This is only a rough guide, with broad topics. You should have much more in your notes taken from the recordings.***

***This study guide is subject to change.***

**Final: 60-70 questions (totally subject to change). Points possible: 150 points. Time limit TBD.**

*You will be asked to apply the knowledge that you’ve acquired in new ways. Exam will be mostly MC questions, with a fair number of matching and also TF, few fill-in. The final cannot be dropped.*

Review your notes for the *main ideas* of all the themes that we covered up to and including the third exam. Ex of main ideas would be: Physical concepts such as energy, density, convection, magnitude and RI, etc…What is plate tectonics?... Where and why do earthquakes and volcanoes occur on Earth?... What is the internal structure of the Earth?... where and how do natural disasters kill more people?... what are the most devastating and/or deadly natural disasters?... what’s the *only* natural disaster humans can control / possibly avoid?...

There will be very few events, if any, from previous sections.

**THE LAST PART OF THE SEMESTER - WEATHER AND SEVERE WEATHER**

*Includes chapters 11, 12, 13, 14, 15 in 7th Edition of Abbott. (This is chapters 9, 10, 11, 12, 13, 16 in 10h Ed)*

* What drives the weather? How is this section different from all the others?... Deaths related to weather in the USA and around the world… Who often dies… and by what?... In what way do we have natural disasters become also man-made disasters? (ex the 2013 Philippines typhoon, 2005 hurricane Katrina – why these?)…
* The Hydrologic Cycle – what is it? What circulates?...Water - where is it? How do you describe the heat capacity of Oceans? (ability to retain heat energy) 🡪 Why is it important for ocean waters? How do the oceans cool off?...What are the phase changes of evaporation and condensation?... How is heat energy absorbed and how is it released? What’s the troposphere and why is it relevant?...
* The Atmosphere – transfer of heat and water through weather – how? What are its salient characteristics? (Tº, P, density, water vapour…) – how do they all relate? What is the power for all weather? – the sun (uneven solar radiation); relate pressure to winds… Describe the convective cell (what happens at the surface, what happens at the troposphere? what happens at Eq, what happens at 30 deg?...– for the Hadley Cell), and the winds generated - what are these prevailing winds? How do they blow? … at what latitudes do we have the great deserts on Earth and why?... what’s the latitude of San Diego, and what does this mean in terms of climate?...
* The Coriolis Effect, what does it do to fast moving objects on Earth? In the *N- hemisphere*: everything veers right. Cyclones – low pressure centers (winds veering right, rotation c-c-wise), and Anticyclones – high pressure centers (winds veering right, rotation c-wise); What’s the relation of these geometries to hurricanes, tornadoes?... What and where are the Trades (Easterlies), the Westerlies? What is Coriolis effect at the Equator? At the Poles?...
* Wildfires in CA – what can cause them? How is air pressure a factor? Santa Ana winds in CA – what are they? When?...The great 2000s firestorms and the recent 2017-18 fires in CA – what is their relevance? Why California?…
* Climate Change – What are the greenhouse gases? Repercussions on Earth, coastal regions;…Temp and CO2 levels in past 150 years or so – how have they changed? However, what has been the trend in temp for the last 60 million years?... last 500 million years?...What were the CO2 levels in the past eras of geologic time? (CO2 related to Temp); What is happening to glaciers?... What is happening to sea level? In North America, where would be extensive flooding (what coasts), and why? … Where are the vast ice sheets today? What are their characteristics (thickness, etc)?... How do they tie in with the hydrologic cycle and to sea level? Where’s climate change being felt the most?... Who is affected the most?... What can the shutdown of the Atlantic Meridional circulation produce in future?...
* Severe Weather – Hurricanes – what are they? The *largest* storm systems, why?… Their overall characteristics; where do they form (at ~what lat.)?... How do they move?... The very busy 2017 hurricane season: where most of the impact?... What are the conditions that produce hurricanes? The Saffir-Simpson scale and of what is it a function?... The storm surge – what is it? Events – Galveston 1900 (why important?); Bangladesh 1970 – Why this country? What is the great killer from hurricanes? (think Philippines 2013 typhoon…) Sandy 2012 – all characteristics; how did this storm become powerful? regions affected? why the damage?... Katrina 2005 – all characteristics; deaths in New Orleans – why? where is New Orleans?... type of storm; widespread damage; what’s Katrina’s significance?... Human influence in creating a large disaster?...
* What is coastal sand erosion and who gets affected the most, and where? (east/south coasts of US)... Where are homes built? How do they mitigate (lessen) this hazard? How do people lose their houses sometimes?...
* Severe Weather – Thunderstorms – what are they? Where and when do they occur most often? What are the stages, what the most powerful stage? Convection, updrafts, downdrafts, heat released… What other severe weather do they produce?
* Severe Weather – Lightning – what is lightning? Where does it occur, and how does it form? Where, how do people die? Per year?... Effects of lightning?...
* Severe Weather – Tornadoes – what are they? Their characteristics; when do they form? What is the scale that measures tornadoes, and what is it a function of? (Enhanced Fujita)... The country that gets hit the most? Who dies most often? What and where are the conditions that produce tornadoes? - the supercell thunderstorm and wall cloud;… What is the damage? Events – outbreak of Spring 2011 in southeast USA, why important? Approximate death toll and its significance?...
* Severe Weather – Floods – what are they? Why are they so lethal? The 2 types of flooding, and where they occur mostly in the US; their main cause; Safe to drive thru flooded streets?... Events – Mississippi River 1993 – regional flood, main causes, the role of artificial levees; Big Thompson Canyon 1976 – flash flood (why deadly?); cause: factors in the development of the thunderstorm…

Flooding in San Diego – Where? Why? Which types? Should we be concerned? Why?...

Any YouTube film clips shown in lectures are equally important.

Thanks for being such a great class!