

Final Exam Study Guide

This final exam will be a 110 minute closed book, closed-notes exam on Monday, December 8, 2008 at 8:30am. It is a comprehensive final and worth 210 points (21% of your grade). Just over half of the exam will cover material discussed in class since November 7, 2008 (stratospheric ozone depletion and climate change). The other half of the exam will cover material from the first two midterm exams.

This study guide covers material since November 7, 2008. Please refer to the study guides from the two midterms for the rest of the material.

- 1) Stratospheric ozone depletion
 - Know why ozone is “good up high, bad nearby”
 - Know that 90% of atmospheric ozone resides in the stratosphere.
 - Know what is meant by ozone column abundance.
 - Know what types of UV radiation stratospheric ozone effectively absorbs.
 - Be able to describe why there is more UV at noon, and less in the morning and afternoon.
 - Know what you need to form ozone, and why ozone is most abundant between ~20-30 km altitude.
 - Define “catalyst”. Be able to list at least 2 catalysts important for stratospheric ozone depletion.
 - Know the two main chlorine reservoirs in the stratosphere.
 - Be able to describe the steps that take place in forming the stratospheric ozone hole over Antarctica.
 - Be able to explain why the ozone hole occurs over the polar-regions, and why it is predominantly a concern over Antarctica, and less so over the Arctic.
 - Be able to describe the role that polar stratospheric clouds (PSCs) play in the formation of the ozone hole.
 - Know the three conditions required for the formation of the ozone hole.
 - Know what the Montreal Protocol is.

- 2) Climate Change
 - Know the difference between weather and climate.
 - Know what determines the temperature of the Earth (solar radiation, albedo, greenhouse effect/thermal emissivity)
 - Know what on earth has a high albedo
 - Know the difference between positive and negative feedbacks in the climate system, and be able to provide an example of each.
 - Be able to define the Greenhouse effect.
 - Know the major greenhouse gases in the atmosphere.
 - Be able to describe at least three lines of evidence that we are experiencing climate change.
 - Be able to discuss several implications of a warmer world.
 - Know what the Kyoto Protocol is.