

Earth System Science 200a: Earth System Climatology (Fall 2008)
(<http://www.ess.uci.edu/~yu/ess200a.html>)

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Tuesdays & Thursdays 9:00-10:20, CH1103

COURSE DESCRIPTION

This course offers an overview of Earth's climate system by describing the major climatological features in the atmosphere and oceans and by explaining the physical principals behind them. The course begins with an introduction of the global energy balance that drives motions in the atmosphere and oceans, then describes the basic structures and general circulations of the atmosphere and oceans, and finally look into major climate change and variation phenomena.

TEXTBOOKS

"*The Earth System*", Kump, Kasting & Crane, Prentice Hall.
"*Understanding Weather and Climate*", by Aguado and Burt, Prentice Hall.
"*Regional Oceanography: An Introduction*", Tomczak & Godfrey, online.
"*Global Physical Climatology*", Hartmann, Academic Press, 1994.
"*Atmosphere, Ocean, and Climate Dynamics*", Marshall and Plumb, Academic Press.

GRADES: Homework (40%); midterm (60%)

HOMEWORKS: Issue and due every Thursday

SYLLABUS

Week 1	9/25, 9/30 & 10/2	Overview & Global Energy Balance Atmosphere Composition; Planetary Energy Balance Greenhouse Effect; Role of Cloud
Week 2	10/7 & 10/9	Atmospheric General Circulation General Circulation in the Troposphere and Stratosphere Jetstreams; Walker Circulation Monsoon, Sea-land Breeze, Santa Ana Wind
Week 3	10/14 & 10/16	Oceanic General Circulation Ocean Structure; Mixed layer, Ekman Layer, and Thermocline Water Mass Formation, Ekman Pumping, and Subduction Surface Ocean Circulation: Wind-Driven Deep Ocean Circulation: Density-Driven Pacific Ocean, Atlantic Ocean, and Indian Ocean Cryosphere
Week 4	10/21 & 10/23	Climate Variability Feedback and Sensitivity El Niño Southern Oscillation Arctic Oscillation; North Atlantic Oscillation; Ozone Hole
Week 5	10/28 & 10/30	Past and Future Climate Changes Tectonic-Scale, Orbital-Scale Climate Changes Future Climate Projection
<u>Midterm</u>	11/7 (Friday)	