

EESC V2100

Spring 2009 Syllabus

General Course Information:

EESC V2100.001 EARTH'S ENVIR SYSTEM: CLIMATE SYSTEM

MW 11:00A-12:15P

INTERNATIONA 407

LABS: T 4-7P

SCHERMERHORN 555 & 558

Instructor Information:

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Course Objectives

This class provides the fundamentals needed for understanding the Earth's climate and its variability. The emphasis is on physical explanations rather than mathematical derivations of the laws that govern the climate system. The class moves from an exploration of the ocean and atmosphere separately to an integrated understanding of climate. The lab component serves to demonstrate concepts learned in lectures through the use of climatological datasets and hands-on experiments.

Method of Instruction:

There are lectures on Mondays and Wednesdays from 11am to 12:15pm, as well as a mandatory lab on Tuesdays, 4-7pm.

Method of Evaluation:

Grading is 30% midterm, 30% final, 30% labs (with the lowest lab dropped), and 10% homework (graded P/F).

Required Texts:

The Earth System, Second Edition (Paperback) by Lee R. Kump, James F. Kasting, Robert G. Crane

Paperback: 432 pages

Publisher: Prentice Hall; 2 edition (August 6, 2003)

ISBN-10: 0131420593

ISBN-13: 978-0131420595

LECTURE SCHEDULE:

Jan-21-09	Session 1	Introduction & pre-test (All)
Jan-26-09	Session 2	Solar Radiation & the Earth's Energy Balance (Ting)
Jan-27-09	Session 3	The Earth's Radiation Budget, Part I: Clear Sky (LAB 1)
Jan-28-09	Session 4	Understanding the Greenhouse Effect (Ting)
Feb-02-09	Session 5	Atmospheric Convection (Ting)
Feb-03-09	Session 6	The Earth's Radiation Budget, Part II: Cloud Forcing (LAB 2)
Feb-04-09	Session 7	Moisture & Clouds (Ting)
Feb-09-09	Session 8	Greenhouse Gases (Schlosser)
Feb-10-09	Session 9	Modern Atmospheric CO ₂ Record (LAB 3)
Feb-11-09	Session 10	Carbon Management (Schlosser)
Feb-16-09	Session 11	Atmospheric Forces, Balances, and Winds (Ting)
Feb-17-09	Session 12	Surface Energy and Water Balance (LAB 4)
Feb-18-09	Session 13	Weather Systems & Weather Forecasting (Ting)
Feb-23-09	Session 14	General Circulation & Climate Zones (Ting)

Feb-24-09	Session 15	Climatological Structure of the Atmosphere (LAB 5)
Feb-25-09	Session 16	Tropical Cyclones and Hurricane (Ting)
Mar-02-09	Session 17	Ocean Circulation (Schlosser)
Mar-03-09	Session 18	Ocean Circulation Simulation (LAB 6 - tank)
Mar-04-09	Session 19	The Gulf Stream and Ocean Stratification (Schlosser)
Mar-09-09	Session 20	Ocean-Atmosphere Coupling (Schlosser)
Mar-10-09	Session 21	Review for Midterm
Mar-11-09	Session 22	Midterm Exam
Mar-23-09	Session 23	ENSO; Ocean-Atmosphere Interactions (Schlosser)
Mar-24-09	Session 24	Agricultural Consequences of ENSO (LAB 7)
Mar-25-09	Session 25	ENSO Impacts; Other Climate Variations/Oscillations: NAO, NAM, SAM, PDO
Mar-30-09	Session 26	Ocean Chemistry and Cycling (Schlosser)
Mar-31-09	Session 27	Ocean Nutrients and Upwelling (Lab 8)
Apr-01-09	Session 28	Ocean Productivity and Nutrients (Schlosser)
Apr-06-09	Session 29	Climate Changes: Present, Past, and Future (Winckler)
Apr-07-09	Session 30	Global Temperature (LAB 9)
Apr-08-09	Session 31	Uncertainties, Emissions, Mitigation (Winckler)
Apr-13-09	Session 32	Climate Archives: The Record (Winckler)
Apr-14-09	Session 33	Vostok Ice Core (LAB 10)
Apr-15-09	Session 34	The Arctic and Climate Change (Winckler)
Apr-20-09	Session 35	Climate and Life (Winckler)
Apr-21-09	Session 36	EdGCM -- Paleo (Lab 11)
Apr-22-09	Session 37	Projections, Impacts, and Adaptations (Winckler): Mitigation HW due
Apr-27-09	Session 38	Mitigation: Option Evaluation (Winckler)
Apr-28-09	Session 39	EdGCM -- Future Projections (LAB 12)
Apr-29-09	Session 40	Review of The Integrated Climate System & post test (Schlosser)
May-04-09	Session 41	Exam review: Final Projections and Impacts Homework due
May-11-09	Session 42	Final Exam