ATS 606 Introduction to Climate - Spring 2017

**Instructor:**
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**TA:**
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**Department programming TA:**
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**Office Hours:**
Rick: Tuesday 2-4 pm
Steven: Tuesday 3-4 pm
Dave: Monday 11-12:30 pm

**Web:**
Class materials are available via: www.atmos.colostate.edu/~davet/AT606

**Class Schedule:**
Monday/Wednesday 10:00-10:50 ATS 101

**Student Learning Goals and Objectives:**
The successful student will gain a broad graduate level process-oriented understanding of the Earth's climate system. The material will provide a strong foundation for further specialized study on the climate system.

**Text:**

**Format:**
The format of the class is lecture/discussion. The preponderance of the course will focus on the fundamentals of climate dynamics. The latter part of the course will focus on current themes or problems in climate research.

**Grading:** The course requirements and grading will be approximately as follows:
*Homework*: 20%
*Exam on first half of course*: 25%
*Exam on second half of course*: 25%
*Term Project*: 25%
*Class Participation*: 5%
Course Outline (subject to change):

- **Weeks 1-3**
  The Sun.
  Radiative transfer.
  Radiative-convective equilibrium
  Gradients in heating.
  Global-mean energy budget.

- **Weeks 4-5**
  Role of clouds in atmospheric energy.
  Surface heat fluxes.
  Surface energy balance models.
  The hydrologic cycle.

- **Weeks 6-8**
  Overview of the atmospheric general circulation.

**Exam 1.**

- **Weeks 9-11**
  The ocean in climate.
  The ocean mixed-layer, stability, and the thermocline.
  The wind-driven circulation.
  The thermohaline circulation.
  Ocean-atmosphere coupling.

- **Week 12**
  Paleoclimate

- **Week 13**
  Natural climate forcing and change.

- **Week 14**
  Climate sensitivity and feedbacks.

- **Week 15**
  Anthropogenic climate change.

- **Finals week**

**Exam 2**