# SYLLABUS Fall 2014
## Physical Basis of Global Warming  SIO 117
Instructor: Ralph Keeling (rkeeling@ucsd.edu, 534-7582)

Lecture: MWF 3:00-3:50 p.m. HSS 1305  
Discussion (not every week, TBD): Wed. 4:00-4:50 HSS 1305

Course Prerequisites: Math 20D and Phys. 2C or consent of instructor

Relevant Texts:  
- David Archer, Global Warming, Understanding the Forecast, Blackwell, 2007 - Available online through UCSD Library  
- David Neelin, Climate Change and Climate Modeling, Cambridge University Press 2011- Available line through UCSD Library

Course material downloads, including lecture notes and problem sets: ted.ucsd.edu  
Problem Sets will be given out roughly weekly, typically due on Friday.

| Reading | Oct 3 | 1. Introduction  
|---------|------|-----------------| (Neelin, 1.1-1.4,1.6)  
|         | Oct 6 | 2. Elements of climate system  
|         |      | Archer 1, Neelin 2.1, 2.4, 2.5.1, 2.6  
|         | Oct 8 | 3. Planetary energy balance  
|         |      | Archer 2, 3 (Neelin 2.2-2.3)  
|         | Oct 10 | 5. Radiative transfer  
|         |      | Archer 5 (Neelin, 2.3)  
|         | Oct 13 | 9. Physical processes 1  
|         |      | Archer 6, Neelin 3.1, 3.2, 3.3, 3.4.4  
|         | Oct 27 | 10. Physical processes 2  
|         |      | Neelin 5.1, 5.4-5.6  
|         | Oct 19 | 12. Refinements to layer model  
|         |      | Neelin 6.1-6.2  
|         | Nov 3 | 13. Climate sensitivity and radiative forcing  
|         |      | Neelin 6.1-6.2  
|         | Nov 17 | 14. Climate feedbacks  
|         |      | Archer 7, Neelin 6.3-6.7  
|         | Nov 19 | 15. Transient climate response  
|         |      | Neelin 6.8  
|         | Nov 26 | 16. Greenhouse gas controls  
|         |      | Archer 8  
|         | Nov 27 | THANKSGIVING HOLIDAY  
|         | Dec 1 | 16. Greenhouse gas controls - continued  
|         | Dec 3 | 17. The carbon cycle and CO₂  
|         |      | Archer 9, 10 (Neelin 2.8)  
|         | Dec 5 | 18. Observed climate changes  
|         |      | Archer 11 (Neelin 7.6)  
|         | Dec 8 | 19. Model projections and consequences  
|         |      | Archer 12 (Neelin 7.7)  
|         | Dec 12 | 19. -continued  
|         | Dec 19 | FINAL EXAM 3:00-5:59 pm Location TBA  

Grading: Problem Sets 25%, Midterm 25%, Final 50%

# Reading