

**SIO 217a Atmospheric and Climate Sciences I:
2014 Fall Atmospheric Thermodynamics**
Course Syllabus and Lecture Schedule

Instructor: Lynn Russell, 343 NH, 534-4852, lmrussell@ucsd.edu
Text: *Thermodynamics of Atmospheres and Oceans*, J. A. Curry & P. J. Webster (1999)

Date	Dy	Ch	Skip:	Hmwk	Title and Topics
6-Oct	M	1	1.2, 1.8-9		Composition, Structure, and State (Composition and Vertical Structure. Kinetic-Molecular Model of the Ideal Gas. Equation of State. Hydrostatic Equilibrium.)
8-Oct	W	1			More on Ch. 1.
10-Oct	F				Office Hour: Homework 1
13-Oct	M	2	2.11	1 due!	First and Second Laws of Thermodynamics (Work, Heat, First Law, Second Law, Heat Capacity, Adiabatic Processes)
15-Oct	W	2			More on Ch. 2.
17-Oct	F				Office Hour: Hurricane Example (Emmanuel) + Homework 2
20-Oct	M	3	3.4-6	2 due!	PODCAST: Transfer Processes (Time-dependent Thermodynamics. Radiant Energy. Radiative Transfer. Transport.)
22-Oct	W	12			PODCAST: Energy Balance Example (Ch12)
24-Oct	F				No Office Hour
27-Oct	M	4	4.5-6		Thermodynamics of Water (Molecular Structure, Properties of Water. Phase Equilibria. Atmospheric Humidity Variables.)
29-Oct	W	4			More on Ch. 4.
31-Oct	F				Office Hour: Homework 3
3-Nov	M	4		3 due!	Nucleation (Surface Tension. Droplet Nucleation. Droplet Growth. Ice Formation.) Project Assignments.
5-Nov	W	5	5.5-7		More on Ch. 5, Cloud Nucleation Demo
7-Nov	F				Office Hour: Homework 4 + Review
10-Nov	M	5		4 due!	Moist Thermodynamic Processes in the Atmosphere (Isobaric Cooling. Evaporation of Water. Adiabatic, Isobaric Mixing. Saturated Adiabatic Cooling.)
12-Nov	W				More on Ch. 6
14-Nov	F				Office Hour: Homework 5 + Project Discussions
17-Nov	M	6		5 due!	Midterm Review, Introduction to Stability: Application and Limitations of Dry Theory (pp. 191-194 ONLY)
19-Nov	W			EXAM	Midterm (Ch. 1-4 plus Energy Balance from Ch. 12)
21-Nov	F				Office Hour: Homework 6 + Project Discussions
24-Nov	M	7		6 due!	More on Ch. 7
26-Nov	W	8		Draft	PODCAST: Cloud Characteristics and Processes (Cloud Classification and Characteristics. Precipitation Processes. Radiative Transfer in a Cloudy Atmosphere. Fogs, Stratus, and Stratocumulus Clouds. Cumuliform Clouds.)
28-Nov	F				Thanksgiving Holiday
1-Dec	M	12		7 due!	Global Energy and Entropy Balances (Planetary Radiation Balance. Global Heat Engine. Entropy and Climate. Global Hydrologic Cycle. Water Vapor Feedback. Cloud-Radiation Feedback. Snow/Ice-Albedo Feedback.)
3-Dec	W	13	13.6-7		Thermodynamic Feedbacks in the Climate System
5-Dec	F				Office Hour: Project Discussions
8-Dec	M				ROAST Presentations (submit presentations by noon)
10-Dec	W				Continue ROAST, "Jeopardy" Review Session
12-Dec	F				Office Hour: Optional Final Exam Review
18-Dec	Th			EXAM	Final Exam (Ch. 1-8, 12, 13, ROAST) at 11:30-2:30, Location TBA (likely Spiess330).