

SIO20: The Atmosphere (Winter 2015)

Tuesdays & Thursdays 12:30 - 1:50 in HSS 1330

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MIDTERM REVIEW SESSION: Wednesday 2/11 at 7-8:20 pm in Peterson Hall, Room 103 (Thu Feb 05, 12:39 a.m.)

PROBLEM SET 2 HAS BEEN POSTED. PLEASE SEE DOCUMENTS. IT WILL BE DUE NEXT THURSDAY, FEBRUARY 5 (Fri Jan 30, 1:43 p.m.)

Instructors

Alexander/Sasha Gershunov
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<https://thiscourse.com/ucsd/sio20>

Office Hours: Tues 2-3, Wed 12:30 -1:30 in Nierenberg Hall 222

Tues in Porters Pub, Wed in NH 222. In specific weeks, office hours may be modified as needed.

Liliana Nunez (TA)
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Office Hours: Wed 11-12, Thur 2-3 in NH 328

Tim Myers (TA)
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Office Hours: Mon 10-12 in MESOM 302

Course Description

This course is an introduction to meteorology and climate. Basic physical concepts of atmospheric structure, moisture and energy are covered first followed by clouds and precipitation. Forces controlling the winds are discussed next with local and regional case studies. The second half of the course focuses on large-scale and global atmospheric dynamics, climate variability and change, as well as on their implications for regional weather. Although this material is global in scope, case studies will be selected preferentially for their relevance to our region and our personal experience, e.g. El Niño, atmospheric rivers, Santa Ana winds and coastal marine layer.

Books

Required



By C. Donald Ahrens Essentials of Meteorology: An Invitation to the Atmosphere (7th

Edition)

C. Donald Ahrens (2014)

[Amazon](#)

Course Details and Policies

Clickers are required and will be used to assess participation as well as knowledge.

Grading will be based on the following:

- Class participation via iClicker ----- 10%
- Problem sets (total of 4 assignments) ----- 20%
- Midterm exam ----- 30%
- Final exam ----- 40%

Course Schedule



Week	Date	Topic	Readings	Assignments	Notes
1	Tue Jan 06	Course introduction			
	Thu Jan 08	Atmospheric composition, structure and energy	Ch 1, pp 2-18; Ch 2, pp 28-46		Essential concepts
2	Tue Jan 13	Seasonal and daily cycles	Ch 2, pp 46-54; Ch 3, pp 58-73		Essential concepts
	Thu Jan 15	Moisture in the atmosphere	Ch 4, pp 84-94 Ch 4, pp 98-99		Essential concepts
3	Tue Jan 20	Moisture, condensation, fog and cloud types	Ch 4, pp 100-119		Essential concepts
	Thu Jan 22	Stability and cloud development	Ch 5, pp 122-129 Ch 5, pp 130-134	Problem set 1 due	Clouds and precipitation
4	Tue Jan 27	Precipitation	Ch 5, pp 134-149		Clouds and precipitation
	Thu Jan 29	Pressure, forces and wind; <i>Local winds: breezes</i>	Ch 6, pp 156-165		Clouds and precipitation
5	Tue Feb 03	Regional wind systems; <i>Chinook, Santa Ana and monsoons</i>	Ch 6, pp 166-181 Ch 7, pp 184-200		Atmospheric dynamics
	Thu Feb 05	Regional wind systems; <i>Severe storms</i>	Ch 10-11	Problem set 2 due	Atmospheric dynamics
6	Tue Feb 10	Global wind systems, ocean-land-atmosphere interaction, <i>jet streams</i>	Ch 7, pp 200-213		Atmospheric dynamics
	Thu Feb 12	MIDTERM EXAM			
7	Tue Feb	Jet streams fronts and midlatitude	Ch 7, pp 200-		Atmospheric

Week	Date	Topic	Readings	Assignments	Notes
	17	cyclones	213 Ch 8		dynamics
	Thu Feb 19	Midlatitude Cyclones (continued); <i>Atmospheric Rivers</i>	Ch 8	Problem set 3 due	Atmospheric dynamics
8	Tue Feb 24	<i>Monsoon systems and the Southwest Monsoon</i>	Ch 7, pp 198-201		Weather and climat case studies
	Thu Feb 26	<i>Coastal Marine Layer Clouds (May grey and June gloom...)</i>			Weather and climat case studies
9	Tue Mar 03	El Niño/Southern Oscillation (ENSO) and <i>Pacific Decadal Oscillation (PDO)</i> ;	Ch 7, pp 213-216 Ch 7, 216-218		Climate dynamics
	Thu Mar 05	<i>Storm-tracks, Teleconnections, and regional climate variability</i>		Problem set 4 due	Climate dynamics
10	Tue Mar 10	Natural climate variability and anthropogenic climate change	Ch 12		Climate dynamics
	Thu Mar 12	Climate change (continued); <i>Impacts on weather, extremes, and society</i>	Ch 13		Weather, climate a society
11	Tue Mar 17	FINAL EXAM			