

SIO 40: "Life and Climate on Earth" (Fall 2013)

Description: This course is an introduction to how the living things on our planet affect, and are affected by, the global environment. We will discuss how life evolved on earth, and how the planet changed with the advent of life. We will explore how the non-living components of the earth system (atmosphere, solid earth, water) interact with the living components to create the comfortable planet that we know and love. In the second part of the course, we will discuss issues related to global climate change, and the potential impacts that mankind has had and will have on our environment. A major goal of this course is to provide non-earth/environmental science majors with the basic scientific background and facts necessary to understand and appreciate current news topics and political issues related to earth and climate science.

Course website: Material for this course, including the course syllabus, lecture files, homework assignments and answer keys will be available on the SIO 40 course website on Ted at Ted.ucsd.edu.

Grades based on: 8 best out of 9 homework assignments (25%); Mid-Term Exam #1 (20%); Mid-Term Exam #2 (20%); and Final Exam (35%). Grades will be assigned using a curve system. Attendance and participation in class is appreciated and will make a positive difference for marginal grades. There will be an opportunity to obtain extra credit, more details TBA.

Reading - There are *no required textbooks* for this course. Necessary information for homeworks, exams etc. is covered in the lecture slides posted on line, unless you are specifically instructed otherwise. For those interested in additional background or further reading, "The Earth System" by Kump, Kasting and Crane (3rd edition) is useful for the first part of the course. For the second part of the course, "Dire Predictions" by Mann and Kump and "Climate Change: What the Science Tells Us" by Fletcher may be useful. Copies of all texts mentioned here will be available on reserve at the Geisel Library. Chapter readings will be suggested as background material for each lecture. Select supplementary reading materials and links to websites relevant to various lecture topics will also be posted on the class website.

Locations and times: Center Hall Room 216, MWF 11:00 -11:50 am

Weekly (*optional*) problem sessions: TBA

Instructor office hours on campus noon-1 pm M,W in Galbraith 364 and by appointment at Scripps Institution of Oceanography campus

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 Teaching Assistants - Randie Bundy, rmbundy@ucsd.edu
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Lecture list, optional further reading and homework assignments:

<u>Date</u>	<u>Lec #</u>	<u>Lecture Topic</u>	<u>Reading/HW due date</u>	
Sep. 27 F	1	Introduction/overview	TES Chapter 1	
Sep. 30 M	2	Basic concepts	" "	" "
Oct. 2 W	3	Origins: Planetary evolution	TES Chapter 10	
Oct. 4 F	4	Origins: Biological evolution	" "	" HW1
Oct. 7 M	5	Life's Beginnings: How the planet changed with life I	TES Chapter 11	
Oct. 9 W	6	Life's Beginnings: How the planet changed with life II	" "	" "
Oct. 11 F	7	Energy balance and greenhouse effect	TES Chapter 3	HW2
Oct. 14 M	8	Atmosphere: Circulation and hydrologic cycle	TES Chapter 4	
Oct. 16 W		Review		HW3
Oct. 18 F		MID-TERM #1		
Oct. 21 M	9	Oceans and Cryosphere	TES Chapter 5/6	
Oct. 23 W	10	Lithosphere	TES Chapter 7	
Oct. 25 F	11	Carbon cycle	TES Chapter 8	
Oct. 28 M	12	Long-term climate record	TES Chapter 12	HW4
Oct. 30 W	13	Glaciations	TES Chapter 14	
Nov. 1 F	14	Recent climate	TES Chapter 15	
Nov. 4 M	15	Climate change basics I	TBD	HW5
Nov. 6 W	16	Climate change basics II	TBD	
Nov. 8 F		Review		HW6
Nov. 11 M		VETERAN'S DAY HOLIDAY		
Nov. 13 W		MID-TERM #2		
Nov. 15 F	17	Climate change projections	TBD	
Nov. 18 M	18	Impacts of climate change	TBD	
Nov. 20 W	19	Ocean acidification and warming	TBD	
Nov. 22 F	20	Climate change NOW: The Arctic	TBD	HW7
Nov. 25 M	21	The ozone hole	TBD	
Nov. 27 W	22	Climate change skepticism	TBD	
Nov. 29 F		THANKSGIVING HOLIDAY		
Dec. 2 M	23	Mitigating climate change I: Geo-engineering	TBD	HW8
Dec. 4 W	24	Mitigating climate change II: Reducing emissions	TBD	
Dec. 6 F		Review		HW9
Dec. 10 Tu		FINAL EXAM, 11:30 am		