SAN DIEGO STATE UNIVERSITY
Global Climate Change
GEOG 409 - Fall 2017

INTRUCTOR

Professor: Fernando De Sales
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Office: Storm Hall 313B

COURSE INFORMATION

Class Days: T-TH
Class Times: 3:30pm – 4:45pm
Class Location: AH-4176

Office Hours (and by appointment): W 3:00pm – 4:00pm
Office Hours Location: SH 313B
Schedule number: 21755

COURSE OVERVIEW

COURSE DESCRIPTION

- The course is designed for students in Geography, Earth sciences, Environmental sciences and related fields. It provides a concise account of the causes and consequences of climate change.
- We start by studying Earth's current climate and the physical processes that maintain it.
- We investigate the causes and consequences of global warming and its relationship to human activities.
- We also describe the processes that have given rise to the sequence of glacial and interglacial periods and that will continue to cause the climate to evolve.
- Additionally, the course will explore climate and climate change modeling, future projections, and their uncertainties.

STUDENT LEARNING OUTCOMES

By the end of the course, students should be able to

1) EARTH'S CURRENT CLIMATE
a) Appreciate the spatial distribution of climate and biodiversity.
b) Describe energy balance and global mean climate.
c) Appreciate the roles of the atmosphere and the oceans in maintaining the current climate

2) EARTH'S PAST CLIMATES
a) Explore past climate and climate changes
b) Describe the role of the Sun-Earth relationship on long-term climate change
c) Evaluate what past climate changes can teach us

3) GLOBAL CLIMATE CHANGE
a) Explore the different causes of global climate change
b) Investigate climate changes in recent years
c) Assess the main terms of the global carbon cycle.
d) Describe the impact of global warming on the oceans, cryosphere, and biosphere

4) FUTURE CLIMATE

a) Describe climate models and their uncertainties

b) Explore the difference scenarios of climate change in the 21st century

c) Explore climate change mitigations and adaptation strategies

A major theme of the course is global climate change and its consequences to the Earth System and mankind. All readings and homework will be oriented around issues and questions supported by scientific observations and peer-reviewed projections.

The course will include an examination of what we know and do not know about the science of climate change and its major mechanisms. Another theme is the interpretation of climate change predictions and the uncertainties inherent to climate models.

COURSE MATERIALS

- Textbook: Climate Change: Past, Present, and Future. Marie-Antoinette Melires and Chloe Marechal. Wiley Blackwell - Hardcopy available at SDSU Book Store and online.
- Additional readings will be posted on Blackboard

COURSE ASSESSMENT AND GRADING

- ASSESSMENT

  There will be two midterm exams and one final exam. The content of exams will be taken from the material covered in lectures.

  Topics that are in the book but not discussed in lecture will not be on the exams unless otherwise noted in class.

  The exams will consist of multiple-choice, and short and long-answer questions.

  Make-up exams will only be allowed for special circumstances and should be arranged before the regular exam is given. If you miss an exam, you must contact the instructor within one week of the exam or you will receive a zero for that exam.

  Re-grades on exams: students may request that an exam be re-graded. This includes all questions and may either increase or decrease the score.

- GRADING

  Exams and homework assignment will be given points from 0 to 100. The final course grade will be calculated based on the total number of points accumulated and on the weights below.

Exam 1:	25%
Exam 2:	25%
Homework:	20%
Final exam:	30%

COURSE CONDUCT

- Cheating and plagiarism on clickers and exams will result in a zero for that assignment or exam. Please read the Academic Honesty section below.
- Use of Electronic Devices: Laptop computers may be used for note taking, but all other electronic devices must be turned off during class time.

- Missed classes: Students must obtain notes from at least one other student if they miss a lecture and check Blackboard for available material. The instructor will not provide notes or review a lecture for students who missed a class.
- Office hours: Visits during office hours are encouraged. Meeting outside established office hours may be made by appointment.
- Emailing the instructor: It is appropriate to set up office visits and ask questions about course material by email to the instructor.

***** The instructor will not answer emails about exams in the 24 hours before the exam *****

ACADEMIC HONESTY

The University adheres to a strict policy regarding cheating and plagiarism. These activities will not be tolerated in this class. Become familiar with the policy (http://www.sa.sdsu.edu/srr/conduct1.html). Any cheating or plagiarism will result in failing this class and a disciplinary review by Student Affairs.

Examples of Plagiarism include but are not limited to:

- Using sources verbatim or paraphrasing without giving proper attribution (this can include phrases, sentences, paragraphs and/or pages of work)
- Copying and pasting work from an online or offline source directly and calling it your own
- Using information, you find from an online or offline source without giving the author credit
- Replacing words or phrases from another source and inserting your own words or phrases
- Submitting a piece of work, you did for one class to another class

If you have questions on what is plagiarism, please consult the policy (http://www.sa.sdsu.edu/srr/conduct1.html) and this helpful guide from the Library:(http://infodome.sdsu.edu/infolit/exploratorium/Standard_5/plagiarism.pdf)

STUDENTS WITH DISABILITIES

If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that accommodations based upon disability cannot be provided until you have presented your instructor with an accommodation letter from Student Disability Services. Your cooperation is appreciated.

COURSE SCHEDULE [tentative]

Week	Dates	Topic	Activity and Assignment
1	Aug 29 Aug 31	Introduction Climate and biodiversity	Chapters 1 and 2
2	Sep 5 Sep 7	Temperature, heat, and thermal equilibrium Global mean climate	Chapter 3 and 4
3	Sep 12 Sep 14	Atmospheric composition and structure Global atmospheric and oceanic circulations	Chapter 5
4	Sep 19 Sep 21	Atmosphere and ocean: key factors in climate equilibrium	Chapters 5 and 6

Week	Dates	Topic	Activity and Assignment
5	Sep 26 Sep 28	Radiative transfer	Chapter 7 and 8
6	Oct 3 Oct 5	Energy balance **Exam 1**	Chapters 9 and 10
7	Oct 10 Oct 12	Climate forcing and feedbacks Different causes of climate change	Chapters 13, 14, and 15
8	Oct 17 Oct 19	Past climates. Glacial and interglacial cycles	Chapters 18, 19, 21
9	Oct 24 Oct 26	The Holocene Climate changes in recent years	Chapters 22, 23, and 25
10	Oct 31 Oct 2	Impact of global warming on the cryosphere and oceans	Chapters 26 and 27
11	Nov 7 Nov 9	Impact of global warming on the biosphere Carbon cycle	Chapter 28 Chapter 29
12	Nov 14 Nov 16	**Exam 2** Carbon cycle (cont.)	Chapter 29
13	Nov 21 Nov 23	Greenhouse gas emissions Longer term climate scenarios	Chapters 30, 31, 32
	Nov 28 Nov 30	Reading assignment Thanksgiving	Material on Blackboard
14	Dec 5 Dec 7	Longer term climate scenarios (cont.) Future warming and its consequences	Chapters 32 and 33
15	Dec 12	Facing climate change: mitigation and adaptation	Chapters 33 and 34
FINAL EXAMINATION THURSDAY, DECEMBER 21, 1pm-3pm			