ENVS 8 Course Outline as of Fall 2024

CATALOG INFORMATION

Dept and Nbr: ENVS 8 Title: GLOBAL CLIMATE CHANGE
Full Title: Introduction to Global Climate Change
Last Reviewed: 4/10/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:
In this course, students will explore the science of climate change including: evidence for climate change, global atmospheric and sea circulation, the factors causing climate to change, how climate has changed, and how scientists study past climates. Students will use models, observations, data, and theory to make predictions about future climate, and the possible consequences of climate change for our planet.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 1A and: Course Completion of one or more of the following courses: ENVS 12, GEOL 1, GEOG 4, or METRO 10

Limits on Enrollment:

Schedule of Classes Information:
Description: In this course, students will explore the science of climate change including: evidence for climate change, global atmospheric and sea circulation, the factors causing climate to change, how climate has changed, and how scientists study past climates. Students will use

models, observations, data, and theory to make predictions about future climate, and the possible consequences of climate change for our planet. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 1A and: Course Completion of one or more of the following courses: ENVS 12, GEOL 1, GEOG 4, or METRO 10
Limits on Enrollment:
Transfer Credit: CSU;UC.
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
	C	Natural Sciences	Fall 2025	
	H	Global Perspective and Environmental Literacy		
	L5	Physical and Biological Sciences		
	C	Natural Sciences	Fall 2019	Fall 2025
	H	Global Perspective and Environmental Literacy		
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B1	Physical Science	Fall 2019	
IGETC:	**Transfer Area**		Effective:	Inactive:
	5A	Physical Sciences	Fall 2019	

CSU Transfer:	Transferable	Effective:	Fall 2019	Inactive:
UC Transfer:	Transferable	Effective:	Fall 2019	Inactive:

CID:

Certificate/Major Applicable:
Major Applicable Course

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Describe the global climate system and how Earth's systems function interdependently
2. Employ critical thinking to evaluate observable climate data
3. Explain the consequences, risks, and uncertainties of climate change

Objectives:
At the conclusion of this course, the student should be able to:
1. Assess and describe the evidence for climate change
2. Explain the relationship between global warming and climate change
3. Differentiate between natural and anthropogenic climate change
4. Discuss Earth’s energy balance, demonstrating an understanding of the enhanced greenhouse effect and radiative forcing
5. Interpret real-world data to explain global oceanic and atmospheric heat transfer and changes to atmospheric processes caused by a warming atmosphere

6. Describe how paleoclimate proxies such as ice cores, sediments, tree rings, and corals can be used to interpret past climates
7. Analyze how climate models work and the role that paleoclimate proxies play in modeling
8. Evaluate the impacts of climate change on humans and describe methods for mitigation and adaptation to those impacts

Topics and Scope:

I. Introduction to Earth's Systems and Climate Change
   A. Interactions among Earth's systems
   B. Definitions of weather, climate, and climate change
II. Understanding Weather and Climate
   A. Orbital cycles
   B. Earth's atmosphere
   C. Global heat transfer
III. The Global Ocean System
   A. Structure of the oceans
   B. Circulation of the oceans
   C. Interaction between oceans and the atmosphere
IV. Energy and Earth's Climate
   A. Solar energy
   B. Earth's energy balance
   C. Greenhouse gases
   D. The enhanced greenhouse effect
   E. Radiative forcing
V. The Evidence for Climate Change
   A. Global temperature data
   B. Changes in sea level
   C. The melting cryosphere
   D. Historical evidence
VI. Time Scales of Climate Change
VII. Earth's Climate History
   A. Climate proxies
   B. Ancient climate
   C. The recent past
VIII. Modeling the Climate
IX. Global Impacts of Climate Change
   A. Global warming
   B. Sea level rise
   C. Ocean acidification
   D. Changing climate and weather patterns
X. Solutions for Managing Climate Change
   A. Energy solutions
   B. The politics of change
   C. Mitigation and adaptation

Assignment:

1. Assigned readings (20-30 pages per week)
2. Written and problem-solving assignments (5-20)
3. Research and/or other project(s) (1-4)
4. Exam(s) (0-5)

5. Quizzes (4-20)
6. Class participation

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Written assignments; research and/or other project(s)	Writing 10 - 50%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Problem-solving assignments	Problem solving 5 - 10%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None	Skill Demonstrations 0 - 0%

Exams: All forms of formal testing, other than skill performance exams.

Exam(s); quizzes	Exams 30 - 80%

Other: Includes any assessment tools that do not logically fit into the above categories.

Class participation	Other Category 0 - 10%

Representative Textbooks and Materials:
Climate Change: What the Science Tells Us. 2nd ed. Fletcher, Chip. Wiley. 2018.
Global Climate Change: The Science of Global Warming and Our Energy Future. 2nd ed. Smerdon, Jason. Columbia University Press. 2018.
Global Climate Change: Turning Knowledge into Action. Kitchen, David. Routledge. 2013 (classic).
Introduction to Modern Climate Change. 3rd ed. Dressler, Andrew. Cambridge University Press. 2021.
Our Changing Climate: Introduction to Climate Science. Kauffman, Chad. American Meteorological Society. 2015 (classic).