

# GEOG 0004 - WEATHER AND CLIMATE

## Catalog Description

Advisory: Eligibility for ENGL 1A

Hours: 54 lecture

Description: The elements and controls of weather and climate - atmospheric heating, the heat budget, air circulation and winds, moisture, clouds, and precipitation; world climates, their classifications; data collection and interpretation, investigate global climates to microclimates. (C-ID GEOG 130) (CSU, UC)

## Course Student Learning Outcomes

- CSLO #1: Analyze the interrelationship between earth and sun as they affect incoming solar radiation (Insolation).
- CSLO #2: Describe local weather phenomena including radiation, heat, temperature, pressure, and wind using data and qualitative means.
- CSLO #3: Investigate base-line data for CO<sub>2</sub> trapped in ice core samples compared to CO<sub>2</sub> levels found today.
- CSLO #4: Explain the different air masses and their source location and their impact on weather.
- CSLO #5: Examine different front types, their evolving stages and hypothesize its effect on weather and climate change.

## Effective Term

Fall 2021

## Course Type

Credit - Degree-applicable

## Contact Hours

54

## Outside of Class Hours

108

## Total Student Learning Hours

162

## Course Objectives

1. Analyze the interrelationship between earth-sun relationships, the atmosphere, seasons, climates and weather.
2. Describe the properties of localized weather phenomena including radiation, heat, temperature, wind and pressure.
3. Identify weather forecasting tools, such as national weather charts & satellite synthesized with regional & local weather station data (such as at an airport), which present data: barometric pressure, relative humidity (dew point spread), local temperatures, cloud cover, and winds.
4. Define and distinguish the locational and environmental causes of climate.
5. Identify atmospheric components and man's impact on the global environment.

6. Compare and contrast modern changing climates with prehistoric reconstructions.

## General Education Information

- Approved College Associate Degree GE Applicability
  - AA/AS - Physical Sciences
- CSU GE Applicability (Recommended-requires CSU approval)
  - CSUGE - B1 Physical Science
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)
  - IGETC - 5A Physical Science

## Articulation Information

- CSU Transferable
- UC Transferable

## Methods of Evaluation

- Classroom Discussions
  - Example: Students will describe local weather phenomena and catastrophic weather in small groups. "Describe the progression of a mid-latitude cyclone." Then students compare and contrast to the larger storms such as a hurricane. Furthermore, the instructor will share with students data that supports the correlation between global warming and more intense storms.
- Problem Solving Examinations
  - Example: Evaluate students ability to describe weather systems and interpret weather charts. Sample assignments include "Explain the stages of a Thunderstorm" or "Read the weather chart for the local area and forecast the weather for the next two days based upon the chart variables.
- Reports
  - Example: With a focus on observation and gathering weather data, students assemble a report on current and predicted weather for a hypothetical cross-country flight (themselves as the pilot) to a distant destination. For example, students plan a safe (visual flight rules - not instrument) flight based on a weather windor looking at satellite imagery, weather discussions, local data and future data, such as dew point, relative humidity spread, and cloud cover (both present and future)

## Repeatable

No

## Methods of Instruction

- Lecture/Discussion
- Distance Learning

Lecture:

1. Following an instructor lecture on the annual march of the seasons, students will use models to demonstrate the earth-sun relationships to explain the annual march of the seasons. Students are required to know the approximate dates of the key dates, e.g. vernal equinox of March 22nd, and why most people on earth have 12 hours of daylight and 12 hours of nighttime.
2. Following an instructor lecture on insolation, students will look at data from weather-station websites and other sources (even the textbook) and determine how incoming solar radiation (insolation)

compares to location's monthly temperatures, noticing the patterns of latitude in general resulting in more or less insolation resulting in warmer or colder wintertime temperatures

## Typical Out of Class Assignments

### Reading Assignments

1. Read the text chapter entitled "Mid-latitude Cyclones", with daily observation and description of the progression of these multi-day winter storms and be prepared to discuss in class. 2. Read maps for weather variables and forecasting, including isobar maps, charts of wind speeds, and satellite images of fronts and storms. Be prepared to discuss in class.

### Writing, Problem Solving or Performance

1. Using current weather information acquired from instrumentation (barometer, thermometer, anemometer, hygrometer, etc.), forecast the weather for the next two days. 2. Find climatic data for the local region and create a climate graph using temperature and precipitation data. Determine and analyze the various factors contributing to the local climate.

### Other (Term projects, research papers, portfolios, etc.)

1. Local experts from the National Weather Service might be invited to discuss with students the newest technology trends and mathematical models used in forecasting. Students are required to prepare questions for these experts and to utilize information gained from class.

### Required Materials

- Understanding Weather & Climate
  - Author: Aguado
  - Publisher: Prentice Hal
  - Publication Date: 2016
  - Text Edition: 7th
  - Classic Textbook?:
  - OER Link:
  - OER:

### Other materials and-or supplies required of students that contribute to the cost of the course.