

# GEOL A131: WEATHER AND CLIMATE

Item	Value
Curriculum Committee Approval Date	10/21/2015
Top Code	191400 - Geology
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)
Associate Arts Local General Education (GE)	• OC Physical/Biological Sci - AA (OB)
Associate Science Local General Education (GE)	• OCC Physical/Biological Sci-AS (OSB)

## Course Description

A survey in meteorology, emphasizing atmospheric composition and variability as well as interactions between atmosphere, oceans and continents to produce our weather. Includes the terminology and tools that meteorologists employ to observe, study and predict storm systems, storm fronts, thunderstorms, tornadoes and wind-driven ocean waves. Current topics such as air pollution and climate change will also be addressed. Transfer Credit: CSU; UC: Credit Limitation: GEOG A130 and GEOL A131 combined: maximum credit, 1 course.

## Course Level Student Learning Outcome(s)

1. Describe the physical composition and nature of the atmosphere, and analyze the natural and anthropogenic factors that influence the atmosphere and climate change.
2. Explain the general circulation of the atmosphere including major pressure cells and winds.
3. Summarize the role humidity, water, and water vapor play in weather and climate.

## Course Objectives

- 1. Describe the physical composition and nature of the atmosphere
- 2. Identify the physical forces which affect the atmosphere
- 3. Summarize the role humidity, water and water vapor play in weather and climate
- 4. Explain the formation and the classifications of fog, clouds and violent forms thereof such as thunderstorms, tornadoes and hurricanes
- 5. Explain the general circulation of planetary winds, cyclones, anticyclones and local winds
- 6. Describe the development and structure of cyclones (extra-tropical)
- 7. Categorize the scientific factors and forces which influence the earth's weather and climate

- 8. Construct a weather map, plotting station models from teletype sequence reports, plotting fronts and contouring isobars
- 9. Describe the unique weather phenomena which affect Southern California
- 10. Describe global climate distribution
- 11. Analyze the natural and anthropogenic factors affecting present and future climates and understand implications of climate change

## Lecture Content

The nature of the atmosphere Heat energy of the atmosphere Air temperature Humidity, water and water vapor Fog, clouds and thunderstorms Atmospheric pressure Wind Observation Theory Cyclones, anticyclones and local winds Planetary winds and the general circulation Air masses and fronts Development and structure of cyclones Tropical cyclones: hurricanes Weather analysis and interpretation Weather in Southern California Climate classification Global climates Natural and anthropogenic climate change Climates of the future

## Method(s) of Instruction

- Lecture (02)
- DE Online Lecture (02X)

## Instructional Techniques

Lecture and application of ideas Individual, paired and small group exercises Independent study

## Reading Assignments

Students will spend approximately two hours per week on readings assigned from textbook(s) Readings from textbook(s), periodic reading from journal articles, and internet assignments.

## Writing Assignments

Students will spend approximately two hours per week on the following: Written assignments that analyze and critically evaluate various types of arguments Lecture exams consisting of essays and short answer questions Chapter questions (may be required or optional) Term project paper and presentation

## Out-of-class Assignments

Students will spend approximately two hours per week on homework including textbook exercises, internet assignments and individual and small group assignments from "Exercises for Weather and Climate" (Carbone).

## Demonstration of Critical Thinking

Students will be assessed on their ability to interpret weather maps and meteorological data to make predictions

## Required Writing, Problem Solving, Skills Demonstration

Students will be assessed on their comprehension of meteorological vocabulary and knowledge of atmospheric processes as demonstrated by: homework assignments written reports quizzes lecture exams written/oral report that highlights some process, event or current issue in weather or climate science

## Eligible Disciplines

Earth science: Masters degree in geology, geophysics, earth sciences, meteorology, oceanography, or paleontology OR bachelors degree in

geology AND masters degree in geography, physics, or geochemistry OR the equivalent. Masters degree required.

### **Textbooks Resources**

1. Required Anderson, B., and Strahler, A. H.. Visualizing Weather and Climate, 1st ed. Wiley, 2008 Rationale: . 2. Required Carbone, G.. Exercises for Weather and Climate, 8th ed. Prentice Hall, 2012 3. Required Ahrens, C. D.. Meteorology Today: An Introduction to Weather, Climate, and the Environment, 10th ed. Brooks Cole, 2012