Cerro Coso College

Course Outline of Record Report

10/07/2021

PHSCC132 : Intro Meteorology Laboratory

General Information

Author:	-
Course Code (CB01) :	PHSCC132
Course Title (CB02) :	Intro Meteorology Laboratory
Department:	Science
Proposal Start:	Fall 2013
TOP Code (CB03) :	(1930.00) Earth Science
SAM Code (CB09) :	Non-occupational
Distance Education Approved:	Yes
Course Control Number (CB00) :	CCC000236234
Curriculum Committee Approval Date:	10/31/2008
Board of Trustees Approval Date:	10/31/2008
External Review Approval Date:	10/31/2008
Course Description:	This course provides laboratory experience that will make the topics covered in the Introductory Meteorology lecture more meaningful and realistic to the student. Interdisciplinary Physical Science concepts and methods are used to explain weather phenomena. Included in the course are measurement of basic weather parameters (such as temperature, pressure, wind, and humidity), weather map interpretation, data plotting and interpretation, instrument usage, and weather analysis and forecasting. Field activities emphasize the interaction between weather phenomena and human activity. Designed for the non-science major.
Submission Type:	New Course
Author:	No value

Faculty Minimum Qualifications

Master Discipline Preferred:	• Earth Science
Alternate Master Discipline Preferred:	• Geography • Physics/Astronomy • Earth Science
Bachelors or Associates Discipline Preferred:	No value
Additional Bachelors or Associates Discipline Preferred:	No value

Course Development Options

Basic Skills Status (CB08)

Course is not a basic skills course.

Course Special Class Status (CB13)

Course is not a special class.

Grade Options

- Letter Grade Methods
- Pass/No Pass

☐ Allow Students to Gain Credit by Exam/Challenge

Allowed Number of Retakes
0

Course Prior To College Level (CB21)
Not applicable.

Rationale For Credit By Exam/Challenge
No value

Retake Policy Description
Type:

☑ Allow Students To Audit Course

Course Support Course Status (CB26)
No value

Associated Programs

☑ Course is part of a program (CB24)

Associated Program	Award Type	Active
CC Liberal Arts: Mathematics & Science	A.A. Degree Major	Summer 2018 to Fall 2020
CSU General Education (CSU GE Breadth)	Certificate of Achievement	Fall 2020
Liberal Arts: Mathematics & Science Associate in Arts Degree	A.A. Degree Major	Fall 2020
CSU General Education (CSU GE Breadth) (In Development)	Certificate of Achievement	Fall 2021

Transferability & Gen. Ed. Options

Course General Education Status (CB25)

No value

Transferability

Transferable to CSU only

Transferability Status

Approved

Cerro Coso General Education Requirements	Categories	Status	Approval Date	Comparable Course
Area 1.2	Natural Science Physical Sciences	Approved	No value	No Comparable Course defined.

CSU General Education Certification	Categories	Status	Approval Date	Comparable Course

Area B.1	Scientific Inquiry & Quantitative Reasoning Physical Sciences	Approved	No value	No Comparable Course defined.

Units and Hours:

Summary

Minimum Credit Units (CB07)	1
Maximum Credit Units (CB06)	1
Total Course In-Class (Contact) Hours	54
Total Course Out-of-Class Hours	0
Total Student Learning Hours	54
Faculty Load	0

Credit / Non-Credit Options

Course Credit Status (CB04)

Credit - Degree Applicable

Course Non Credit Category (CB22)

Credit Course.

Non-Credit Characteristic

No Value

Course Classification Status (CB11)

Credit Course.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

	In Class	Out of Classs
Lecture Hours	0	0
Laboratory Hours	3	0
Activity Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	0
Course In-Class (Contact) Hours	
Lecture	0
Laboratory	0
Activity	0
Total	54
Course Out-of-Class Hours	
Lecture	0
Laboratory	0
Activity	0
Total	0

Time Commitment Notes for Students

No value

Faculty Load

Extra Duties: 0

Faculty Load: 0

Units and Hours: - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Prerequisite

PHSCC131 - Introduction to Meteorology Lecture

Entrance Skills

Entrance Skills	Description
No value	No value

Limitations on Enrollment

Limitations on Enrollment	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction	Discussion
Rationale	No value

Methods of Instruction	Lecture
Rationale	No value

Assignments

- A. Textbook reading B. Homework exercises for each class period. Example: An exercise that introduces students to meteorological resources on the Internet includes National Weather Service site, independent weather forecasting sites, weather observation data sites, sites of local interest and sites of special interest (El Nino and La Nina). Example: An exercise that reinforces the student's understanding of adiabatic lapse rates, rising air masses, condensation, precipitation, relative humidity and specific humidity involves a scenario of rising and descending air and how relative and specific humidity are affected by the resulting temperature changes.

Methods of Evaluation	Rationale
Tests	A. Exams that test the student's command of the subject matter as well as evaluate the student's ability to apply information learned to problem solving and real life situations. Example: The various stages of the passage of a mid latitude cyclonic storm system on a particular location and what specific types of weather might be expected.
Participation	B. Class participation in discussions. This involves preparing for the discussion by doing appropriate reading from the textbook and additional research as necessary.

Equipment

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
	Okalhoma Climatological Survey. (2006) Explorations in Meteorology, A Lab Manual. , , Brooks/Cole.			
	Carbone, G. (2010) Exercises for Weather and Climate, 7th, Prentice Hall.			
	Paul, R. A. (2010) Exercises in Meteorology, 2nd, Prentice Hall.			
	Ackerman, S. A. & Knox, J. A. (2007) Meteorology: Understanding the Atmosphere, 2nd, Brooks/Cole.			
	Lutgens, F. K. & Tarbuck, E. J. . (2010) The Atmosphere: An			

Introduction to Meteorology, 11th, Prentice Hall.

Auando E. & Burt, J. E. . (2010) Understanding Weather and Climate, 5th, Prentice Hall.

A. Ahrens, C. D. . (2009) Meteorology Today: An Introduction to Weather, Climate and the Environment. , 9th, Brooks/Cole Cengage Learning.

Other Instructional Materials

No Value

Materials Fee

No

Learning Outcomes and Objectives

Course Objectives

No value

CSLOs

Describe the principles of physical science and the scientific method as they apply to the atmosphere. Expected SLO Performance: 70.0

Science Liberal Arts: Mathematics & Science AA Degree	Describe the nature of science, the methods applied in scientific investigations, and the value of those methods in developing a rigorous understanding of the physical world.

Describe the various atmospheric processes and their relationships that determine the weather. Expected SLO Performance: 70.0

Determine how the atmosphere maintains the balances required for continuation of life. Expected SLO Performance: 70.0

Compare the strengths and limitations of our understanding of the atmosphere, weather forecasting, and climate. Expected SLO Performance: 70.0

Define global climates past and present and apply knowledge of atmospheric processes to assess changes in climates. Expected SLO Performance: 70.0

Analyze information as it relates to meteorological topics of contemporary interest. Expected SLO Performance: 70.0

Social Science PLOs for CSU GE COA	Communicate scientific results by applying the appropriate scientific method, including experimental and empirical methodologies characteristic of science and modern methods and tools used in scientific inquiry through the use of graphs, oral communications, and writings.

Science Liberal Arts: Mathematics & Science AA Degree	Apply algebraic, graphical, numerical, and other methods to solve applied problems in the areas of mathematics, natural sciences, computer graphics, and computer animation.

Outline

Course Outline

A. Introduction
1. Definition of Meteorology
2. Scientific Method
3. Scientific Basis of Meteorology
4. Branches of Meteorology
5. Sources of weather information
6. Meteorological instruments and measurements
7. Information on weather maps

B. The Earth and Its Atmosphere
1. Atmospheric origin; composition and structure
2. Distinction between meteorology; weather; and climate
3. Evolution of the earth's atmosphere
4. Atmospheric constituents
5. Methods of probing the atmosphere
6. Atmospheric vertical temperature profile
7. Ionosphere
8. Solar-terrestrial relations

C. Energy(A- C)
1. Electromagnetic radiation spectrum
2. Energy; temperature and heat
3. Heat transfer in the atmosphere
4. Solar radiation and albedo
5. Solar constant
6. Earth's energy budget

D. Seasons and Temperature
1. Seasonality
2. Temperature variation
3. Temperature scales
4. Heat transport
5. Specific heat
6. Heating/cooling degree days
7. Wind-chill

E. Atmospheric Humidity
1. Hydrologic cycle
2. Evaporation; condensation and saturation
3. Relative humidity and dew point
4. Measuring humidity

F. Condensation: Dew; Fog and Clouds
1. Condensation nuclei
2. Dew and frost
3. Fog
4. Clouds

G. Stability and Cloud Development
1. Atmospheric stability and instability
2. Convection
3. Topography
4. Changing cloud forms

H. Precipitation
1. Precipitation processes
2. Precipitation types
3. Measuring precipitation

I. Air Pressure and Winds
1. Atmosphericpressure
2. Forces that influence the winds
3. Winds and vertical air motions

J. Wind: Small Scale and Local Systems
1. Interactions with the environment
2. Wind direction and speed
3. Local wind systems

K. Wind: Global Systems
1. General circulation of the atmosphere
2. Jet streams
3. Atmosphere-ocean interactions

L. Air Masses and Fronts
1. Air mass source regions and classification
2. Fronts

M. Middle-Latitude Cyclones
1. The polar front
2. Vertical structure of mid-latitude cyclones
3. Upper level waves and mid-latitude cyclones
4. Developing mid-latitude cyclones
5. Polar lows

N. Weather Forecasting
1. Weather forecasting tools and methods
2. Weather forecasting using surface charts
3. Weather predictions

O. Thunderstorms and Tornadoes
1. Thunderstorm types and characteristics
2. Thunderstorm distribution
3. Lightning
4. Tornado distribution and formation
5. Doppler radar

P. Hurricanes
1. Hurricane characteristics
2. Life cycle of ahurricane
3. Winds and rain
4. Notable hurricanes

Q. TheEarth's Changing Climate
1. Past climates
2. Causes of climate change
3. Global warming

R. Global Climates
1. Climate classification
2. Global climate patterns and variability

S. Air Pollution
1. Types and sources of air pollution
2. Factors that affect air pollution
3. Air pollution and the urban environment

Lab Outline

This laboratory course provides the student with practicalexperience in meteorological field methods; data collection and manipulation; and enhancement of topicspresented in the Detailed Topical Outline.

Example: Given a table of "Length of Daylight Period"; students will graph diurnal isolation curves for various locations and describe how these curves relate to temperature variation and seasonality.

Example: Given graphs of incoming solar radiation;outgoing terrestrial radiation and near-surface air temperature; students willdescribe how the daily temperature cycle relates to radiation.

Example: Given sample data of air temperature; dewpoint; and a graph of saturation vapor pressure as a function of temperature;students will determine saturation vapor pressure; vapor pressure and relativehumidity. Students will relate thesedata to various scenarios of rising and descending air and resulting weather.

Delivery Methods and Distance Education

Delivery Method: Please list all that apply -Face to face -Online (purely online no face-to-face contact) -Online with some required face-to-face meetings ("Hybrid") -Online course with on ground testing -iTV – Interactive video = Face to face course with significant required activities in a distance modality -Other

No Value

Rigor Statement: Assignments and evaluations should be of the same rigor as those used in the on-ground course. If they are not the same as those noted in the COR on the Methods of Evaluation and out-of-class assignments pages, indicate what the differences are and why they are being used. For instance, if labs, field trips, or site visits are required in the face to face section of this course, how will these requirements be met with the same rigor in the Distance Education section?

No Value

Effective Student-Instructor Contact: Good practice requires both asynchronous and synchronous contact for effective contact. List the methods expected of all instructors teaching the course. -Learning Management System -Discussion Forums -Moodle Message -Other Contact -Chat/Instant Messaging -E-mail -Face-to-face meeting(s) -Newsgroup/Discussion Board -Proctored Exam -Telephone -iTV -Interactive Video -Other (specify)

No Value

Software and Equipment: What additional software or hardware, if any, is required for this course purely because of its delivery mode? How is technical support to be provided?

No Value

Accessibility: Section 508 of the Rehabilitation Act requires access to the Federal government's electronic and information technology. The law covers all types of electronic and information technology in the Federal sector and is not limited to assistive technologies used by people with disabilities. It applies to all Federal agencies when they develop, procure, maintain, or use such technology. Federal agencies must ensure that this technology is accessible to employees and the public to the extent it does not pose an "undue burden". I am using -iTV—Interactive Video only -Learning management system -Publisher course with learning management system interface.

itv
LMS
publisher

Class Size: Good practice is that section size should be no greater in distance ed modes than in regular face-to-face versions of the course. Will the recommended section size be lower than in on-ground sections? If so, explain why.

No Value