GAVILAN COLLEGE
5055 Santa Teresa Blvd
Gilroy, CA 95023

Course Outline

COURSE: PSCI 2 DIVISION: 10 ALSO LISTED AS:

TERM EFFECTIVE: Fall 2021 CURRICULUM APPROVAL DATE: 03/08/2022

SHORT TITLE: INTRO METEOROLOGY

LONG TITLE: Introduction to Meteorology

Units	Number of Weeks	Type	Contact Hours/Week	Total Contact Hours
3	18	Lecture:	3	54
		Lab:	0	0
		Other:	0	0
		Total:	3	54

COURSE DESCRIPTION:

An introductory course in Meteorology that is both descriptive and analytical on the physical principles affecting the earth's weather. Topics covered include the nature of the atmosphere, solar energy, heat, temperature, pressure, stability, moisture, wind, storms, severe weather and forecasting. The course introduces climatology as a scientific study and will look at the earth's climatic history, current research in climate modeling and the possibility of global climate change. ADVISORY: Skills equivalent to those of an elementary algebra course.

PREREQUISITES:

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

02 - Lecture and/or discussion
05 - Hybrid
71 - Dist. Ed Internet Simultaneous
72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

By the end of this course, a student should:

1. Identify and interpret the symbols on a weather map.
2. Compare and contrast the different mechanisms that produce heating imbalances in the atmosphere.
3. Explain the relation between the wind field and pressure patterns.

COURSE OBJECTIVES:

By the end of this course, a student should:

1. Identify principal weather systems that are plotted on surface weather maps, describe properties of weather systems, define common parameters used to describe the state of the atmosphere, explain advantages of satellite observations, distinguish between visible and infrared satellite images, apply the 'hand-twist' model of wind direction to the circulation in actual highs and lows, draw isobars to show the pattern of surface air pressure across the nation at map time.
2. Describe how air temperature changes as air pressure changes, make clouds appear and disappear in a bottle, describe the role condensation nuclei play to enhance cloud formation, explain how most clouds form in the atmosphere.
3. List the principal components of the atmosphere's planetary-scale circulation, describe the linkage between the subtropical anticyclones and the trade winds, describe the linkage between the subtropical anticyclones and the westerlies.
4. List the characteristics of a severe thunderstorm, sketch the synoptic weather pattern that favors severe thunderstorms, describe the atmospheric conditions that precede a lighting discharge. Describe the appearance of thunderstorms on visible satellite imagery. Identify probable locations of thunderstorms on infrared satellite imagery. List some of the characteristics of the path of an intense tornado. Describe the general weather conditions favorable for formation of tornadic thunderstorms. Explain why winds on one side of a tornado may be stronger than winds on the other side.

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Curriculum Approval Date: 03/08/2022

4 Hours

CONTENT: Introduction to basic characteristics of weather, sources of weather information, various parameters that are used to describe the state of the atmosphere. This is the Preview module, designed by the American Meteorological Society to let students become familiar with the course.

3 Hours

CONTENT: Introduction to basic characteristics of weather, sources of weather information, various parameters that are used to describe the state of the atmosphere.

4 Hours

CONTENT: Introduction to atmosphere: origin, composition and structure.Distinguishing between weather and climate.

3 Hours

CONTENT: Solar and terrestrial radiation. Study of the flow of electromagnetic radiation into and out of the Earth-atmosphere system.

4 Hours

CONTENT: Heat, temperature and atmospheric circulation. Introduction to the measure of temperature, how heat is transported via conduction, convection, and phase changes of water. Distinguishing between sensible heating and latent heating, and their importance on a global scale.

3 Hours

CONTENT: Air pressure. Discussion of an aneroid barometer compared to a mercury barometer, discuss the significance of air pressure tendency for local weather forecasting. Show how the gas law applies to the atmosphere, how surface air pressure varies with different types of air masses, how divergence and convergence of horizontal winds can cause changes in air pressure.

4 Hours

CONTENT: Humidity, saturation and stability. First of three sections on moisture in the atmosphere, describing fundamental concepts of global water cycles, ways of expressing water vapor concentration, the nature of saturation through expansional cooling, stability of air, and lifting processes.

3 Hours

CONTENT: Humidity, saturation and stability. Second section on moisture in the atmosphere, considering cloud formation and classification, fog, precipitation processes and forms, and weather radar.

4 Hours

CONTENT: Clouds, precipitation and weather radar. Third section on moisture in the atmosphere, considering cloud formation and classification, fog, precipitation processes and forms, and weather radar.

3 Hours

CONTENT: Wind and weather. Discussion of atmospheric circulation and weather systems, forces (pressure gradient, centripital, Coriolis, friction and gravity) that initiate and shape the wind.

3 Hours

CONTENT: Atmosphere's Planetary Circulation. This and the next three sessions are concerned with the genesis and characteristics of a variety of weather systems. We examine these systems in order of decreasing spatial scale, beginning with the largest scale, the global or planetary circulation. Semipermanent pressure systems, wind belts, and the Intertropical Convergnece Zone (ITCZ) are principal features of the planetary-scale circulation.

3 Hours

CONTENT: The second of four sessions concerned with the genesis and characteristics of a variety of weather systems. The Intertropical Convergence Zone (ITCZ) and El Nino will be examined as principal features of the atmospheric circulation.

4 Hours

CONTENT: Weather systems of middle latitudes. This session covers synoptic-scale weather systems plus selected regional and local circulation systems that affect the weather of middle latitudes. Air masses,

fronts, cyclones, and anticyclones are plotted on surface weather maps.

3 Hours

CONTENT: Thunderstorms and tornadoes. This session covers the genesis, properties, and hazards of thunderstorms and tornadoes. We describe the three stages in the life cycle of a thunderstorm cell (cumulus, mature, and dissipating) and distinguish among single-cell and multi-cellular thunderstorms.

4 Hours

CONTENT: Tropical weather systems. In this session we examine tropical weather systems with primary focus on hurricanes and tropical storms. We describe the characteristics of hurricanes, their geographical and seasonal distribution, hazards associated with hurricanes, and the life cycle of tropical cyclones.

2 Hours

Final exam

METHODS OF INSTRUCTION:

Online lectures, student investigations, exams, and online weather projects.

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours 108

Assignment Description

1. Regularly assigned homework that requires students to analyze and study pertinent text material, solved examples and lecture notes.

2. Regularly assigned homework that requires students to apply the principles and skills covered in class by solving related problems.

3. Writing assignments/reports on topics related to meteorology.

METHODS OF EVALUATION:

Objective examinations

Evaluation Percent 40

Evaluation Description

Objective examinations including multiple choice, true/false, matching items, completion, short answer/essay questions.

Problem-solving assignments

Evaluation Percent 60

Evaluation Description

Homework problems; Online investigations; individual projects; group projects

REPRESENTATIVE TEXTBOOKS:

Weather Studies: Introduction to Atmospheric Science, 7th Edition, Elizabeth Mills, American Meteorological Society, 2020.

ISBN: 1944970606

14 Grade Verified by: David Argudo

Weather Studies eInvesigations Manual, 2015-2016 and Summer 2016.

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

GAV B1, effective 200550

CSU GE:

CSU B1, effective 200550

IGETC:

IGETC 5A, effective 200550

CSU TRANSFER:

Transferable CSU, effective 200550

UC TRANSFER:

Transferable UC, effective 200550

SUPPLEMENTAL DATA:

Basic Skills: N
Classification: Y
Noncredit Category: Y
Cooperative Education:
Program Status: 1 Program Applicable
Special Class Status: N
CAN:
CAN Sequence:
CSU Crosswalk Course Department:
CSU Crosswalk Course Number:
Prior to College Level: Y
Non Credit Enhanced Funding: N
Funding Agency Code: Y
In-Service: N
Occupational Course: E
Maximum Hours:
Minimum Hours:
Course Control Number: CCC000016202
Sports/Physical Education Course: N
Taxonomy of Program: 190100