San Bernardino Valley College
Curriculum Approved: FA01

I. CATALOG DESCRIPTION:

A. Department Information:

Division: Science & Math
Department: Geography
Course ID: GEOG 114
Course Title: Weather and Climate
Units: 4
Lecture: 3 hours
Laboratory: 3 hours
Prerequisite: None

B. Catalog Description:

The earth's atmospheric phenomena with special reference to causes and regional distribution of weather and climate, both past and present.

Schedule Description:
The earth's atmospheric phenomena with special reference to causes and regional distribution of weather and climate, both past and present.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES FOR STUDENTS:

Upon completion of the course, the student should be able to:

A. Describe the atmosphere as a system.
B. Explain the basic nature of weather and climate.
C. Distinguish between weather and climate.
D. Explain and apply the functions of the weather machine.
E. Account for the unequal distribution of energy on the earth.
F. Explain and describe the global wind system.
G. Explain and apply world precipitation processes.
H. Describe and apply the Koppen System of climate classification.
I. Recognize the nature of climate change.
J. Distinguish between real and spurious evidence of climate change.

IV. CONTENT:

LECTURE

A. Earth-sun relations
   1. Day and night
   2. Unequal distribution of energy
   3. Seasons
B. Temperature
   1. Altitude
   2. Latitude
   3. Land/water contrasts
C. Atmosphere
   1. Lapse rate
   2. Layers of the atmosphere
   3. Ozone
   4. Energy losses

D. Pressure and winds
   1. Measures of pressure
   2. Pressure cells
   3. Rate and manner of air flow
   4. Pressure gradient
   5. Coriolis effect
   6. Friction
   7. Global winds

E. Moisture
   1. Latent heat of condensation
   2. Relative humidity
   3. Forms of condensation
   4. Fog
   5. Precipitation
   6. Causes and regional patterns of precipitation

F. Air masses and fronts

G. Climate classification: The Koppen System

H. Climate change
   1. Historical
   2. The Pleistocene

Laboratory

A. Earth/sun relations
B. Solstices and equinoxes
C. Normal lapse rates
D. Adiabatic lapse rates
E. Latitude and longitude
F. Time zones
G. Time computations
H. Barometric pressure
I. Relative humidity and dew point computations
J. Weather maps
K. Climographs

V. METHODS OF INSTRUCTION:

A. Lecture
B. Guided discussion
C. Work groups (Guided instruction)
D. Videos and slides
E. Research papers
F. Presentations
G. In-class data analysis
H. In-class exercises requiring critical thinking

VI. TYPICAL ASSIGNMENTS:

A. Read the chapter and answer, “Briefly describe the idealized global circulation proposed by George Hadley. Did subsequent observations confirm Hadley’s proposal?
B. Using the chart given in class determine the relative humidity and dew point for the locations given.

VII. EVALUATION(S):

A. Methods of evaluation:

1. Critical thinking and/or mathematical analysis questions from text, weekly
2. Four exams spaced appropriately. Fifty points each and consisting of objectice measures and analysis and mapping items.
3. In-class exercises involving data analysis, computation, or mapping.
4. One final examination consisting entirely of short answer, essay, plotting, and mapping, 200 points

SAMPLE QUESTIONS:

1. Precipitation can be made to occur in a variety of ways. Which of the following is not a cause of precipitation.
   a) Convection
   b) Orographic
   c) Nimbic Refection
   d) Frontal Activity
   e) None of the above
2. Air circulation at the ground surface in a southern hemisphere cyclone is a:
   a) Clockwise outspiral
   b) Counterclockwise inspiral
   c) Counterclockwise outspiral
   d) Clockwise inspiral
   e) Geostrophic wind pattern
3. The Pleistocene has been described as the “The Ice Age.” In Point of fact, what climatic change actually occurred during the last two million years of earth history?

B. Frequency of evaluation:

1. Four tests
2. One final
3. Text questions
4. Projects and exercises

VIII. TYPICAL TEXT(S):

Lutgens, Frederick and Edward Tarbuck, The Atmosphere, 7th edition, Prentice-Hall, 1998
Ahrens, C. Donald, Meteorology Today, 1st edition, Brooks/Col, 2000
Murphy, Brendan and Damian Nance, Earth Science Today, 1st edition, Brooks/Cole, 1999

IX. OTHER SUPPLIES REQUIRED OF STUDENTS:

None.