I. GENERAL DESCRIPTION
A. Date of Approval
   1. Updated: June 1, 1999
   2. Updated: August 16, 2007
B. Department: Earth Sciences
C. Course Number: Geography 1L
D. Course Title: Physical Geography Laboratory
E. Course Outline Preparer: Darrel Hess
F. Department Chairperson: Darrel Hess
G. Dean: Wing Tsao

II. COURSE SPECIFICS
A. Hours: Three (3) laboratory hours weekly
B. Units: 1
C. Prerequisite: Geography 1, which may be taken concurrently
   Corequisite: None
   Advisory: None
D. Course Justification:
   Physical geography laboratory is a transferable physical science laboratory course. Students are introduced to basic laboratory skills in physical geography, including the interpretation and analysis of weather and climate data, weather maps, satellite images, aerial photographs and topographic maps.
E. Field Trips: As required by course content
F. Method of Grading: Letter
G. Repeatability: 0

III. CATALOG DESCRIPTION
The study of weather and climate, tectonic processes, and landforms. Emphasis on the interpretation of weather maps, climate data, aerial photographs, and topographic maps.
IV. MAJOR LEARNING OUTCOMES
Upon completion of this course a student will be able to:

A. Describe and explain the different kinds of map scales, and demonstrate the ability to measure distances on maps using different kinds of map scales.
B. Demonstrate the ability to determine compass azimuths using a pocket transit.
C. Describe and explain how the altitude of the noon Sun can be calculated for any given day of the year at any given latitude by utilizing the analemma.
D. Describe and explain the worldwide system of time zones and demonstrate the ability to calculate time zone changes.
E. Describe and explain the factors influencing global patterns of insolation and temperature.
F. Describe and explain the reasons for changes in relative humidity, and demonstrate the ability to calculate adiabatic temperature changes.
G. Demonstrate the ability to determine relative humidity with the use of a sling psychrometer.
H. Demonstrate the ability to interpret and explain weather maps that utilize isobars and station models.
I. Demonstrate the ability to interpret and explain visible light and infrared weather satellite images.
J. Demonstrate the ability to interpret landscape features on U.S. Geological Survey topographic maps and with stereo aerial photographs.
K. Recognize and describe the development of landforms produced by faulting, volcanism, mass wasting, fluvial processes, arid land processes and glacial processes.

V. COURSE CONTENT
A. Introduction to Physical Geography Laboratory
B. Map scale
   1. Graphic
   2. Fractional
C. Field mapping
   1. Pacing
   2. Use of pocket transit
   3. Global positioning system (GPS) technology
D. Time zone calculations
E. Calculation of solar altitude
   1. The analemma
F. Insolation and temperature patterns
   1. Average daily insolation
   2. Temperature control factors
G. Atmospheric pressure and wind
   1. Isobars
   2. Weather map station models
   3. Use of hand-held wind meters
H. Moisture in the atmosphere
   1. Relative humidity
   2. Use of sling psychrometer
   3. Use of relative humidity and dew point psychrometer tables
   4. Calculating adiabatic temperature changes

I. Standard U.S. Weather Service weather maps
   1. Station model symbols
   2. Surface and 500 millibar weather maps

J. Weather satellite images
   1. Visible light satellite images
   2. Infrared satellite images
   3. Water vapor images
   4. Satellite image movie loops

K. Contour lines and U.S. Geological Survey topographic maps
   1. Contour line rules
   2. Symbols on topographic maps
   3. Topographic profiles
   4. Public land survey system

L. Stereo aerial photographs
   1. Use of lens stereoscope

M. Field trip—mapping of the Hayward Fault in Hayward

N. Landforms produced by faulting and volcanism
   1. Strike-slip faulting
   2. Normal faulting
   3. Shield volcanoes
   4. Composite volcanoes
   5. Plug domes
   6. Cinder cones

O. Field trip—observation and analysis of geomorphic features on Twin Peaks, San Francisco

P. Fluvial landforms
   1. Drainage basins
   2. Floodplain landforms
   3. Stream rejuvenation
   4. Flood recurrence intervals

Q. Mass wasting
   1. Fall
   2. Slide
   3. Flow

R. Desert landforms
   1. Basin and range topography
   2. Sand dunes

S. Glacial landforms
   1. Erosional landforms
   2. Depositional landforms
T. Coastal processes and landforms

VI. INSTRUCTIONAL METHODOLOGY
A. Assignments
   1. Reading from handouts and textbook to provide basic understanding of topics detailed in V.
   2. Written laboratory exercises that provide skills in understanding basic foundations of topics detailed in V.
   3. Written field trip exercises that provide analytical and interpretive skills in topics detailed in V.
B. Evaluation
   1. Three to four written exams and quizzes (including a written final exam) that measure the student's ability to achieve the objectives indicated in IV.
   2. Assignments as described in VI.A.2 and VI.A.3.
C. Texts and other materials
   1. Instructor-generated handouts with references to textbook such as
      or
   2. Laboratory manual, such as

VII. REQUESTED CLASSIFICATION
(X) CREDIT/DEGREE APPLICABLE (meets all standards of Title V. Section 55002(a)).