METRO 10L Course Outline as of Fall 1999

CATALOG INFORMATION

Dept and Nbr: METRO 10L Title: WEATHR ANALYSIS LAB
Full Title: Weather Analysis Forecasting & Climatology Lab
Last Reviewed: 9/24/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	1.00	Lecture Scheduled	0	17.5	Lecture Scheduled	0
Minimum	1.00	Lab Scheduled	3.00	14	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 0.00 Total Student Learning Hours: 52.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:
The study, interpretation, and analysis of surface weather maps. The preparation of weather forecasts from surface maps and their integration with analysis from upper level air charts and the GOES weather satellite photographs.

Prerequisites/Corequisites:

Recommended Preparation:
Concurrent enrollment in METRO 10 or completion of METRO 10.

Limits on Enrollment:

Schedule of Classes Information:
Description: Study, interpretation & analysis of surface weather maps. Preparation of weather forecasts from surface maps & their integration with analysis from upper level air charts & the GOES weather satellite photographs. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended: Concurrent enrollment in METRO 10 or completion of METRO 10.
Limits on Enrollment:

Transfer Credit: CSU;UC.
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B3	Laboratory Activity	Fall 1981	
IGETC:	**Transfer Area**		Effective:	Inactive:
	5C	Fulfills Lab Requirement	Fall 1981	

CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive:

CID:

Certificate/Major Applicable:
Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:
Upon completion of this course, the student will:
1. Correctly identify all states on a blank outline map of the United States.
2. Correctly identify all major rivers, lakes, and mountain ranges on a blank outline map of the United States.
3. Calculate the total solar energy received in kilowatt hours from a day's graph of solar radiation recorded by a solar pyrannometer over one square meter of surface area.
4. Write a short essay describing how latitude affects the length of daylight and the altitude of the noon time sun on the winter and summer solstice dates.
5. Construct an isothermal map of the United States from a National Weather Service 21 Zulu temperature report.
6. Construct an isohyet map of the United States from rainfall data collected from the Western Regional Climate Center.
7. Correctly identify and color code all weather fronts, squall lines, and trofs on a National Weather Service surface map.
8. Correctly read the wind speed and wind direction from the wind symbols used by the National Weather Service on their surface weather maps.
9. Properly read the temperature, dew point temperature, air pressure, and percent of cloud cover from the symbols used by the National Weather Service on their surface weather maps.
10. Construct a valid National Weather Service symbolic station report from an airport weather report.
11. Write a descriptive essay on how to interpret a National Weather Service radar map to find out where rain is falling, where

thunderstorms are occurring, and in which directions the thunderstorms are moving.
12. Correctly locate a warm front and cold front on a weather map that depicts temperatures and wind directions.
13. Write an essay describing how the lines of equal elevation are plotted on a National Weather Service 850 millibar chart.
14. Correctly identify the regions of warm air advection on an 850 millibar chart.
15. Use a 500 millibar chart to locate trofs, ridges, and the probable path of the jet stream.
16. State the correct units for vorticity, and know what minimum value of vorticity indicates stormy weather.
17. Locate the jet stream on a 300 millibar chart and correctly identify the isotachs that indicate 70, 110, and 150 knot winds.
18. Determine a weather station's lifting condensation level, convective condensation level, and convective temperature by reading a skew - T sounding plot.
19. Identify what values of lifted index, total total's index, and bulk Richardson number indicate thunderstorm activity.
20. Use an enhanced infra-red satellite photograph to locate low pressure systems, cold fronts, warm fronts, and thunderstorms.
21. Use the MRF and RUC models to write a one, two, and three day forecast for Santa Rosa temperatures and rainfall.
22. Use the Altavista internet search engine to find weather websites that provide satellite photographs and weather forecast models.

Topics and Scope:

LABORATORY MATERIAL:

I. North American Geography
   A. Relevance to broadcast meteorology
   B. Canadian Provinces and U.S. States
   C. Major North American lakes and rivers
   D. Major North American mountains, valleys, and plateaus
II. Seasons and Solar Energy
   A. Latitude and length of daylight
   B. Latitude and noontime sun altitude
   C. Solar energy collection
   D. Units of energy
III. Isopleth Mapping
   A. Isopleths used in weather maps
   B. Construction of an isohyet map of Sonoma County
   C. Construction of an isothermal map of the United States
   D. Interpretation of isopleth maps
IV. Synoptic Scale Surface Weather Maps
   A. Fronts and squall lines
   B. Zulu time and standard time zones
   C. Isobar pressures and the pressure gradient force
   D. Highs, lows, trofs and ridges
V. Decoding Surface Station Reports
   A. The Beaufort wind symbols
   B. Pressure and pressure tendencies

C. Weather activity symbols
D. Color coding surface weather maps

VI. Constructing Surface Weather Charts
A. Decoding aviation weather reports
B. Symbolic representation of aviation weather reports
C. Locating cold fronts and warm fronts
D. Weather radar interpretation

VII. The 850 Millibar Chart
A. Lines of equal elevation
B. Individual station reports
C. Correlation with surface maps
D. Interpretation of dew point depressions

VIII. The 500 Millibar Chart
A. Lines of equal elevation
B. The 5640 meter line in forecasting
C. Trofs and ridges
D. Individual station reports

IX. The 300 Millibar Chart
A. Isotochs and the jet stream
B. Lines of equal elevation
C. Individual station reports
D. Introduction to the Skew - T pseudo-adiabatic chart

X. Interpretation of Weather Satellite Images
A. Formation of Infra-Red images
B. Cloud identification
C. Locating frontal systems
D. Enhanced Infra-Red and Visible satellite images

XI. Pseudo-Adriatic Charts and Weather Forecasting
A. Skew - T temperature and dewpoint plots
B. Determinations of stability
C. Calculating the convective temperature and lifting condensation level
D. Severe thunderstorm indexes

XII. Weather on the Internet
A. Forecast models
B. Hurricane information
C. Five day planner forecasts
D. Radar reports and satellite photographs

Assignment:

Each student is evaluated on their performance in frequent examinations which contain objective, written, and problem solving questions. Final evaluation also requires that each student competently complete at least one of the following written assignments: comprehensive research paper, analytic essay, lab report, book report, extra credit report, or field assignment. Students will be required to master textbook and research material independently outside of class.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Lab reports, Term papers	Writing 10 - 30%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Lab reports, Quizzes, Exams	Problem solving 15 - 25%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Class performances, Performance exams	Skill Demonstrations 5 - 20%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, Completion	Exams 40 - 70%

Other: Includes any assessment tools that do not logically fit into the above categories.

Attendance, assignments on time, improvement on final exam.	Other Category 0 - 20%

Representative Textbooks and Materials:
STUDIES IN WEATHER AND CLIMATE: by P.W. Sucking and P.R. Doyon, Contemporary Publishing Company, 1991
FROM WEATHER VANES TO SATELLITES: by Spiegel and Gruber, John Wiley and Sons, 1992
EXPERIMENTS TO STUDY OUR ATMOSPHERIC ENVIRONMENT: by Steven Businger, Prentice Hall, 1996
A BASIC METEOROLOGY EXERCISE MANUAL: by Chelius and Frentz, Kendall Hunt, 1992