Douglas College

EFFECTIVE: SEPTEMBER 2004
CURRICULUM GUIDELINES

A:	Division:	**INSTRUCTIONAL**	Effective Date:		**SEPTEMBER 2004**
B:	Department / Program Area:	**GEOGRAPHY** **FACULTY OF HUMANITIES & SOCIAL SCIENCES**	Revision	**X**	New Course
			If Revision, Section(s) Revised:		**C, J**
			Date of Previous Revision:		**MAY 2002**
			Date of Current Revision:		**APRIL 2004**

C: **GEOG 1110** **D:** **WEATHER AND CLIMATE** **E:** **3**

Subject & Course No. Descriptive Title Semester Credits

F: Calendar Description: Why do certain places have particular kinds of weather? How do forecasters predict the weather? Is global warming really happening? These questions are among those addressed in this interactive and hands-on introduction to meteorology, climatology and biogeography. In Geography 1110, energy concepts and radiation laws are used to examine atmospheric processes and patterns. Concepts examined include atmospheric and oceanic circulation, weather elements and patterns, severe weather, climate patterns, and past and future climate change. Plant and animal distribution patterns and their causes are also studied, along with human impacts on the atmosphere and biosphere.

G: Allocation of Contact Hours to Type of Instruction / Learning Settings

Primary Methods of Instructional Delivery and/or Learning Settings:

Lecture and Lab

Number of Contact Hours: (per week /semester for each descriptor)

Lecture: **2 hrs. per week / semester**
Lab: **2 hrs. per week / semester**

Number of Weeks per Semester: **15**

H: Course Prerequisites:

NONE

I: Course Corequisites:

NONE

J: Course for which this Course is a Prerequisite

GEOG 2210, GEOG 2230, GEOG 2321

K: Maximum Class Size:

35

L: PLEASE INDICATE**:**

	Non-Credit
	College Credit Non-Transfer
X	College Credit Transfer:

SEE BC TRANSFER GUIDE FOR TRANSFER DETAILS (www.bccat.bc.ca)

M: Course Objectives / Learning Outcomes:

At the conclusion of the course the successful student will be able to:

1. Describe and use the frameworks of science applicable to 1st-year physical geography.

2. Think critically and examine climatological, meteorological and biogeographical issues in a scientific context at local, regional and global scales.

3 Describe and explain the processes that occur within earth's atmosphere, hydrosphere and biosphere systems, and identify and describe interactions among these systems.

4. Communicate effectively using the language, graphical presentation methods and quantitative methods employed in physical geography.

5. Connect theoretical applications to "real-world" observations and measurements.

N: Course Content:

1. Introduction
   - Scientific method
   - Systems theory and its application to planet Earth
   - Sun / Earth geometry

2. Solar Energy and Radiation Laws
   - First Law of Thermodynamics
   - Electromagnetic radiation
   - Wien's Displacement Law, Stephan-Boltzmann Law and the Inverse Square Law
   - Variation in the receipt of solar radiation

3. The Earth's Atmosphere
   - Evolution of the modern atmosphere
   - Classification of the atmosphere
   - Anthropogenic atmospheric pollutants and their effects

4. Energy Concepts, Energy Balance
   - Second Law of Thermodynamics
   - Energy transfer, transmission and absorption
   - Heat energy concepts
   - Radiation and energy balances

5. Temperature Variation
   - Influences on temperature
   - Temperature patterns
   - Measurement of temperature

6. Pressure and Atmospheric Circulation
   - Pressure and its variation, distribution and measurement
   - Gas Law
   - Forces influencing the direction and speed of upper level and surface winds
   - Patterns of atmospheric and oceanic circulation
   - Macro- and meso-scale winds

Course Content Cont'd.

7. Moisture in the Atmosphere
   - Indices of water vapour content
   - Methods and forms of condensation
   - Mechanisms and forms of precipitation

8. Adiabatic Processes and Stability
   - Diabatic and adiabatic processes
   - Lapse rates
   - Concept and types of stability

9. Air Masses, Fronts, Mid-latitude Cyclones
   - Air mass formation, classification and modification
   - Front types, formation and characteristics
   - Development, evolution and movement of mid-latitude cyclones
   - Anticyclones

10. Severe Weather
    - Characteristics and life-cycles of air mass and severe thunderstorms
    - Tornado formation, characteristics and dimensions
    - Hurricane development, characteristics, structure, forecasts and damage

11. Global Climates
    - Köppen and Thornthwaite climate classification schemes
    - Patterns and characteristics of A, B, C, D, E and H climates

12. Biogeography
    - Ecological biogeography and its relationship to climatic patterns
    - Abiotic and biotic influences on primary productivity in various ecosystems
    - Trophic relationships in ecosystems
    - Stages of general ecological succession in ecosystems

13. Climate Change
    - Evidence for past climate variation
    - Urban heat island
    - Atmospheric greenhouse effect and critical analyses of global warming predictions
    - Local actions to reduce greenhouse gas emissions

O: Methods of Instruction:

The course will employ a variety of instructional methods to accomplish its objectives, including some of the following: lecture, labs, field work, analysis and interpretation of surface weather charts and satellite images, slides, videos, individual and/or team projects and small group discussions.

P: Textbooks and Materials to be Purchased by Students:

Texts will be updated periodically. Typical examples are:

Christopherson, R. W. (2002). Geosystems: An Introduction to Physical Geography (5^{th} ed.). New Jersey: Prentice Hall.

Q: Means of Assessment:

The evaluation will be based on course objectives and will be carried out in accordance with Douglas College policy. The instructor will provide a written course outline with specific evaluation criteria during the first week of classes.

Evaluation will include some of the following:
- Laboratory assignments with a combined value of up to 50%.
- Multiple choice and short answer exams with a combined value of up to 50%.
- Field work with a value of up to 20%.
- A term project with a value of up to 25%.

An example of a possible evaluation scheme would be:

Laboratory Assignments	10%
Two Laboratory Exams	30%
Midterm Examination	25%
Final Examination	25%
Term Project	10%
	100%

Note: This course received a standing variance from Education Council in November 1999 to allow up to a 15% open book lab exam in the penultimate week of the semester. This is not a final exam; it is an assessment of student learning of lab work performed in the second half of the semester.

R: Prior Learning Assessment and Recognition: specify whether course is open for PLAR

Yes, students may take a challenge exam to apply for recognition of prior learning

Course Designer(s): S. Smythe

Education Council / Curriculum Committee Representative

Dean / Director

Registrar