Douglas College

EFFECTIVE: JANUARY 2003
CURRICULUM GUIDELINES

A.	Division:	**INSTRUCTIONAL DIVISION**	Effective Date:		**JANUARY 2003**
B.	Department / Program Area:	**GEOGRAPHY** **FACULTY OF HUMANITIES & SOCIAL SCIENCES**	Revision	**X**	New Course
			If Revision, Section(s) Revised:		**F, G, M, N, O, P, Q, R**
			Date of Previous Revision:		June 1986
			Date of Current Revision:		September 2002

C: **GEOG 210** **D**: **CLIMATOLOGY** **E:** **3**

Subject & Course No. | Descriptive Title | Semester Credits

F: Calendar Description: This study of physical and dynamic climatologic processes and principles follows from Geography 110. Atmospheric energy, moisture and momentum constitute the framework in which observed elements such as temperature, humidity and wind are employed to exemplify climatologic and meteorologic principles. Environmental issues involving human impacts such as air pollution, urban heat islands, global warming and ozone depletion are also examined.

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

Primary Methods of Instructional Delivery and/or Learning Settings:

Lecture

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

Lecture **2 hrs. per week**
Lab **2 hrs. per week**

Number of Weeks per Semester: **14**

H: Course Prerequisites:

GEOG 110

I: Course Corequisites:

NONE

J: Course for which this Course is a Prerequisite

NONE

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 student will be able to:

1. Describe and use the frameworks of science applicable to 2nd-year physical geography.
2. Describe and explain the forms and exchanges of radiation and heat energy and discuss the laws applicable to the development of a radiation balance for the earth and its atmosphere.
3. Explain the constructs and quantitative representations of energy and moisture budgets and their connections to different observed environmental conditions.
4. Compute adiabatic lapse rates and evaluate conditions of stability and instability in the atmosphere including the use of temperature entropy diagrams.
5. Describe and explain the forces controlling air motion and the resultant types of wind patterns.
6. Describe and explain the relationship between upper level circulation and surface pressure patterns.
7. Describe and explain methods employed to measure climatologic elements.
8. Describe atmospheric conditions contributing to air pollution and the anthropogenic implications of air pollution.
9. Discuss applications of climatology to water resource and agricultural contexts.

N: Course Content

1. Introduction to Climatology
2. Energy Principles and Concepts:
   a) Types of energy
   b) Energy dimensions
   c) Laws of Thermodynamics
3. Radiation - The Radiation Balance
   a) Radiation Laws and distribution
4. Energy
   a) Energy budgets
   b) Transfers and exchanges
   c) Pattern of distribution
5. Atmospheric Moisture
   a) Measurement of humidity
   b) Condensation processes
   c) Solution to curvature effects
6. Adiabatic Processes and Stability
   a) Adiabatic lapse rates
   b) Construction and use of tephigrams
   c) Cloud development
   d) Potential temperature
   e) Wet bulb potential temperature
   f) Precipitation formation and measurements

Continued…

Course Content Cont'd.

7. Atmospheric Circulation
   a) Forces affecting air motion
   b) Surface and upper air circulation
   c) Interaction between upper air circulation and surface conditions
   d) Regional winds
   e) Local winds

8. Global Circulation
   a) Climatic classification and indices
   b) Climatic controls - climatic patterns

9. Applications of Climatology
   A) Hydrometeorology
   B) Agroclimatology
   C) Human comfort indices
   D) Climatic controls and indices

10. Climate Change
   A) Anthropogenic
   B) Urban climates
   C) Air pollution

O: Methods of Instruction

This course will employ a variety of instructional methods to accomplish its objectives, including some of the following:

- Lecture
- Labs
- Field Work
- Slides/Videos
- Individual and/or Team Projects
- Small Group Discussions
- Map Analysis

P: Textbooks and Materials to be Purchased by Students

Texts will be updated periodically. A typical example of a text would be:

Ahrens, Donald. (2003). Meteorology Today: An Introduction To Weather, Climate, and the Environment (7^{th} ed.). Pacific Grove, California: Thompson Learning, Inc.

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.

An example of an evaluation scheme would be:

Labs	30%
Project	20%
Lab Exam	10%
Midterm Exam	20%
Final Exam	20%

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): Kathy Runnalls

Education Council / Curriculum Committee Representative

Dean / Director

Registrar