

A: Division: ACADEMIC DATE: OCTOBER 3, 1994

B: Department: SOCIAL SCIENCES New Course: _____

Revision of Course
information form: X

DATED: FEBRUARY, 1982

C: GEOGRAPHY 120 D: INTRODUCTION TO EARTH SCIENCES E: 3
Subject & Course No. Descriptive Title Semester Credit

F: Calendar Description:

An introductory course focussing on the origin of the Earth's land surface, and its modification by surface processes. Topics include: minerals and rocks, geologic time, weathering and soils, and the processes creating landforms of river, groundwater, glacial, periglacial, coastal and desert systems. Human impacts on the land surface are also discussed.

Summary of Revision:

(Enter date & section)
1994-10-03
Sections F, G, N, O, P, Q & R

G: Type of Instruction: Hours Per Week/

Lecture	<u>2</u>	Hrs.
Laboratory	<u>2</u>	Hrs.
Seminar	_____	Hrs.
Clinical Experience	_____	Hrs.
Field Experience	_____	Hrs.
Practicum	_____	Hrs.
Shop	_____	Hrs.
Studio	_____	Hrs.
Student Directed Learning	_____	Hrs.
Other	_____	Hrs.
TOTAL	4	HOURS

H: Course Prerequisites: None

I: Course Corequisites: None

J: Course for which this course is a pre-requisite: Geog.220, and is recommended as a pre-requisite for Geog.230.

K: Maximum Class Size:
35

L: College Credit Transfer X
College Credit Non-Transfer _____

M: Transfer Credit:

Requested _____
Granted X
Specify Course Equivalents or Unassigned Credit as Appropriate

- U.B.C. Geog.103 (3)
- S.F.U. Geog.112 (3) With Douglas College Geog.110-SFU Geog. 111 (3)+Geog.112 (3).
- U. Vic. EOS 100 lev (1.5)
- OTHER:

S.R. Smythe
COURSE DESIGNERS

P.M. Sigon
DIVISIONAL DEAN

Elizabeth Peckers
DIRECTOR/CHAIRPERSON

P.H. Dyer
REGISTRAR

N: Textbooks and materials to be purchased by students
(Use Bibliographic Form):

Page 2 of 6

Christopherson, R.W. (1994) Geosystems. An Introduction to Physical Geography
(2nd Ed.) Toronto, Maxwell Macmillan

Hamblin, W.K. and J.D. Howard (1992) Exercises in Physical Geology (8th Ed.)
Toronto, Maxwell Macmillan

Texts will be updated periodically.

Complete Form with Entries Under the Following Headings:

- O. Course Objectives; P. Course Content; Q. Method of Instruction;
- R. Course Evaluation

O. Course Objectives

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

1. Using diagnostic properties, identify and classify common rock forming minerals.
2. Identify and classify common igneous, sedimentary and metamorphic rocks.
3. List and describe basic igneous, sedimentary and metamorphic rock-forming environments.
4. Interpret topographic maps and construct topographic cross-sections.
5. List periods of Geologic Time and give criteria used for their classification.
6. List and describe fundamental principles of Earth Sciences.
7. List and describe types of weathering, factors which affect them, and results of weathering.
8. List and describe major groups of the Canadian Soil Classification System, soil characteristics and soil-forming processes.
9. List and describe types of mass movement and factors that influence slope stability.
10. List and describe components of the hydrologic cycle.
11. List and describe processes that act in river, groundwater, glacial, periglacial, coastal and desert systems.
12. Identify landforms from topographic maps, aerial photographs and landscape observation, and describe landforms of river, groundwater, glacial, periglacial, coastal and desert systems.
13. Use a simple GIS package for terrain evaluation.

P. Course Content

1. Introduction to Earth Sciences
Physical Geography Within Geography
Earth Sciences Within Physical Geography
History and Development of Earth Sciences

2. Plate Tectonics and Crustal Deformation
Plate Tectonic Theory
 - Development
 - Evidence
 - Mechanisms and Global PatternsPlate Boundary Types
Plate Boundary Interactions and Their Results

3. Minerals
Atomic Theory
Rock-Forming Mineral Families
Diagnostic Properties
Mineral Identification

4. Rocks
Igneous Rocks, Their Characteristics and Rock-Forming Environments
Sedimentary Rocks, Their Characteristics and Rock-Forming Environments
Metamorphic Rocks, Their Characteristics and Rock-Forming Environments
Rock Cycle
Identification of Rocks

5. Geologic Time and Principles
Divisions of Time: Eras, Periods and Epochs
Criteria for Divisions
Fundamental Earth Science Principles
 - Original Horizontality
 - Superposition
 - Cross-cutting Relationships
 - Faunal Succession

6. Topographic Maps
Projections
Map Scale
Geographical and Cartesian Coordinate Systems
Direction Indicators
Contour Line Construction and Interpretation
Construction of Topographic Profiles
Calculation of Vertical Exaggeration and Gradients

7. Volcanism
Mechanisms and Global Patterns
Extrusive Igneous Activity
 - Eruption Types
 - Vent Types
 - Resulting Rock Bodies and LandformsIntrusive Igneous Activity
 - Resulting Rock Bodies and Landforms

8. Weathering

Chemical Weathering

- Solution
- Hydrolysis
- Carbonation

Physical Weathering

- Hydration
- Frost Action
- Pressure-Release

Factors Which Affect Rates of Weathering

- Climate
- Surface Area
- Jointing, Bedding, Foliation

Products of Weathering

- Spheroidal Forms
- Regolith

9. Soils

Soil Characteristics

- Profiles
- Horizons
- Chemistry
- Properties: Colour, Texture, Structure, Consistence, Porosity

Formation Factors

Canadian System of Soil Classification

Geographic Distribution of Canadian Soils

10. Mass Movement

Categories of Mass Movements

- Falls
- Avalanches
- Slides
- Flows
- Creep

Factors Affecting Slope Stability

11. Hydrologic Cycle

Components of the Hydrologic System

Water Storage on the Solid Earth

12. River Systems

Drainage Basin Networks, Patterns and Densities

Stream Orders

Channel Patterns

Processes

- Stream Erosion
- Stream Transport
- Flow Characteristics
- Capacity and Competence

Fluvial Erosional and Depositional Landforms

Impacts of Human Interference on River Systems

13. Groundwater Systems
Porosity and Permeability
Springs, Wells, Artesian Water, Geysers
Solution Processes
Karst Topography
Human Interference With Groundwater Systems
 - Pollution
 - Saltwater Encroachment
 - Subsidence

14. Aeolian Systems
Geographic Distribution of Deserts and the Reasons for Their Distribution
Wind Erosion and Transport
Landforms Developed by Abrasion, Deflation and Deposition
Desert Fluvial Processes and Landforms
Human Impact on Deserts

15. Coastal Systems
Components of the Coastal Environment
Coastal Processes
 - Tides
 - Waves
 - Wave Refraction and Longshore CurrentsCoastal Erosional and Depositional Processes and landforms
Types of Coastlines
Human Impact on Coastal Environments

16. Glacial Systems
Types of Glaciers
Glacial Processes
 - Ice Formation
 - Movement
 - Mass BalanceLandforms Created by Glacial Erosion and Deposition

17. Periglacial Landscapes
Geographic Distribution
Factors Affecting Periglacial Activities
Permafrost
Ground Ice
Frost Action Processes
Hillslope Processes
Periglacial Landforms
Human Impact on Periglacial Environments

Q. Method of Instruction

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

- Lectures
- Labs
- Field Work
- Seminar Presentations
- Slides, Videos
- Small Group Discussions

R. Course Evaluation

The instructor will present a written course outline with specific evaluation criteria at the beginning of the semester. Evaluation will be carried out in accordance with Douglas College policy and will be based on some of the following:

1. Laboratory assignments with a combined value of up to 50%.
2. Multiple choice and/or short answer tests with a combined value of up to 50%.
3. Field work with a value of up to 20%.
4. A term project with a value of up to 25%.
5. An individual or group presentation on an assigned topic with a value of up to 15%.

An example of one possible evaluation scheme would be:

Laboratory Assignments	10%
2 Laboratory Exams	30%
Mid Term Examination	25%
Final Examination	25%
Term Project	<u>10%</u>
	<u>100%</u>