Douglas College

CURRICULUM GUIDELINES

A: Division: **Science and Technology**

B: Department/ Program Area: **Geology**

Date: **29 November 2000**

New Course [ ]

Revision [X]

If Revision, Section(s) Revised: **H,P**

Date Last Revised: **21 January 1998**

C:	**D:**	**E:**
GEOL 420	**Ancient Environments**	**4**
Subject & Course No.	Descriptive Title	Semester Credits

F: Calendar Description: This course is an introduction to the reconstruction of ancient environments using information from sediments and rocks. The principles of stratigraphy and sedimentology will be used to show how environmental information can be interpreted from the rocks. Students will also learn how information from the past can contribute to our prediction of future environmental conditions. Field trips may be required.

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

Primary Methods of Instructional Delivery and/or Learning Settings:

Lecture/Labs/Field Trips

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

6

Number of Weeks per Semester:

14

H: Course Prerequisites:

GEOL 120 or GEOL 121 or permission of instructor

I. Course Corequisites:

NIL

J. Course for which this Course is a Prerequisite:

NIL

K. Maximum Class Size:

36, lab 18

L: PLEASE INDICATE:

[ ] Non-Credit

[ ] College Credit Non-Transfer

[X] College Credit Transfer: Requested [X] Granted [ ]

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

UBC	GEOL 256
SFU	EASC 201
Uvic	EOS 201

M: Course Objectives/Learning Outcomes

The purpose of this course is to introduce students to the fields of sedimentology and stratigraphy, the two areas that are fundamental to the interpretation of the sedimentary rock sequence. The reconstruction of earth history depends to a large upon the interpretation of sedimentary rocks, which form a cumulative sequence documenting past environments on the earth's surface and containing fossils of ancient organisms. Students will learn how the present is the key to the past, in that modern observations of sedimentological processes form the basis of rock sequence interpretation; but also that the past is the key to the future, given that these processes will continue. Students will learn the methods of dating and correlating rocks; the concept of facies and its relation to environments; and methods used to reconstruct ancient environments and climates. Special attention will be paid to western Canadian examples.

N: Course Content

1. Distribution and importance of sedimentary rocks
2. Fundamental interpretive principles; uniformitarianism
3. Sedimentary processes and sedimentary rocks
   - a) Basic classification
   - b) Stratification
   - c) Sedimentary structures (+lab)
   - d) Sequence interpretation
   - e) Facies concepts (+lab)
   - f) Correlation (+lab)
   - g) Diagenesis (+lab)
   - h) Introductory petrology of sedimentary rocks (+lab)
4. Global dynamics and stratigraphy
   - a) Isostasy
   - b) Plate tectonics and lithospheric motion
   - c) Sea level fluctuations (eustatic changes)
   - d) Transgressions and regressions
5. Stratigraphic principles and definitions
   - a) Biostratigraphy
   - b) Lithostratigraphy
   - c) Chronostratigraphy
   - d) Integrated models
   - e) Structure contour maps and isopach maps (+lab)
6. Sedimentary environments, recent and ancient
   - a) Fluvial environments and clastic sedimentation
   - b) Coastal environments and clastic sedimentation
   - c) Self carbonates and coral reefs
   - d) Intertidal and supratidal evaporites and carbonates
   - e) Shelf-to-basin sequences
   - f) Aeolian environments and clastic sedimentation
   - g) Glacial environments and clastic sedimentation
7. Time sequences: evidence for cyclicity and underlying patterns of processes
   - a) Quaternary record of cyclicity: land and sea
   - b) Evidence for Paleozoic cyclicity
8. Integrative models of stratigraphy: case studies
9. Sedimentary mineral deposits and energy sources

O: Methods of Instruction

This course will involve 2 hours/week of direct lectures; 2 hours of lab in which students will directly examine rock samples or work with sedimentary sequence problems; and 2 hours of seminar in which instructor and students will discuss key topics, view slide or film presentations, or work on individual projects. Field trips will be scheduled when appropriate. Readings will be assigned to supplement the lectures.

P: Textbooks and Materials to be Purchased by Students

Walker, R.G. and N.P. James (eds.) 1992 Facies Models: Response to Sea Level Changes. Geological Assoc. Of Canada.

Q: Means of Assessment

Midterm Exam	25%
Term paper/project	20%
Lab exercises (5, biweekly)	25%
Final exam	30%
	100%

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

Course Designer(s)

Education Council/Curriculum Committee Representative

Dean/Director

Registrar