ENVR 107B PHYSICAL GEOLOGY FOR ENVIRONMENTAL SCIENCE

Course Outline Winter 2004 (Jan 5- 30)
Prerequisite: English 12,.Chem 120.
Lectures Tuesday - 3:30-5:20 in Fisher 300
Lab Thursday - 9:30-12:20 in Fisher 300

1. Instructor

Dr. Tark S. Hamilton Office Fisher 344-A
Phone 370-3331
Office Hours: as posted M, T, F: 10:30-11:20, Tues 1:30-2:20 or by appointment
hamilta@camosun.bc.ca

2. Intended Learning Outcomes

All material is presented in the context of Earth materials and physical processes as they relate to the environment. After successfully completing all components of this course students will be able to:

1. Recognize mineral names, physical properties, chemical composition, formation
2. Identify ~50 common rock-forming minerals on their physical properties
3. Infer how samples of some common rocks have formed: process and conditions
4. Describe & interpret textures of igneous, sedimentary & metamorphic rocks
5. Describe mineral & chemical variations of abundant rock types
6. Understand the chemical formulae and chemical stability of common minerals
7. Classify common rocks based on texture and mineral proportions
8. Relate a range of geological processes and identify their products
9. Understand the natural resources, their settings, limits, value and environments
10. Understand geological environments and cycles for surface and ground waters
11. Relate environmental conditions to geological settings and products
12. Learn to tell soils, sediments and various geological substrates apart
13. Understand the oxidation of sulphide minerals and acid rock drainage
14. Read and interpret geological maps including: stratigraphy, structure, resources.

3.Required Materials

(a) Texts

An Introduction to Environmental Geology, 2nd ed., Edward A. Keller, Prentice Hall
Laboratory Manual in Physical Geology, AGI, 6th ed., Ed. Richard M. Busch and Dennis Tasa
These were to be ordered by the bookstore and available as a package for a discount. They will also be used for the subsequent ENVR Geoscience courses
Recommended reading of other geology texts such as: Earth, Tarbuck and Lutgens, 7th ed.; a geological glossary (dictionary), a mineral identification book and web based research, readings, real and virtual field trips.

(b) Other

Hand lens, protractor, drawing compass, coloured pencils.

4. Instruction

Classroom 3 hours
Tue 3:30-5:20
Lab 3 hours
Thursday – 9:30-12:20 F300 and local field trips during lab time and weekend day trips.
4 weeks

5. Assessment

(a) Lab exercises 4 X 6.25%
(b) 1 written exam 50%
(c) 1 short term paper 20%
(d) 1 weekend field trip 5%

6. Grading system

Marking Scheme:

A+	100-95	A	94-90	A-	89-85		
B+	84-80	B	79-75	B-	74-70		
C+	69-65	C	64-60	D	59-50	F	<50

7. Sequence of topics (subject to modification and repetition):

Week 1:
Environmental Geology: population, resources, pollution & sustainability
Geological processes and products, uniformitarianism and geohazards
Matter and minerals: compositions, crystal structures and physical properties
& ***Lab 1 + 3:***

Week 2:
The Rock Cycle and its relation to environments and plate tectonics
Igneous rocks, volcanoes and plutons, and resources sited in igneous settings
Weathering, soil formation, erosion and mass wasting
Sedimentary processes, environments, sediments, rock types and resources
Metamorphism, metamorphic rocks settings, formation and resources
& ***Lab 4, 5, 6 +7:*** ***Extra Lab 8 as take home assignment.***

Week 3:
Water, ice, resources, environmental changes & pollution
Environmental reserviors and fate of pollutants: surface & groundwater, sediments
Acid rock drainage, causes, sources, containment and remediation
& ***Lab 11 & 12:***

Week 4:
Geohazards and different landscapes
Earthquakes: types, recurrence, location, effects, tectonic settings
Substrates, foundations, stability: terrestrial and marine
Local Geology of Vancouver Island and that of western Canada
Human activities, projects, geohazards, engineering and remediation
Disasters, recurrences, risk assessment, remediation
& ***Lab 14, 15, & 16:***

8. Course purpose: introduction to the physical make up and natural processes on and within the earth with an emphasis to the environment and resources. Always ask what each topic has to do with resources, hazards and the environment.