CAMOSUN COLLEGE	**School of Arts & Science** **CHEMISTRY AND GEOSCIENCE DEPARTMENT** **GEOS 110** **Earth-Ocean-Atmosphere System** **Winter/2013**

COURSE OUTLINE

The course description is online @ http://camosun.ca/learn/calendar/current/web/geos.html

Ω *Please note: the College electronically stores this outline for five (5) years only.*
*It is **strongly recommended** you keep a copy of this outline with your academic records.*
You will need this outline for any future application/s for transfer credit/s to other colleges/universities.

1. Instructor Information

(a)	Instructor:	Dr. Vic Levson
(b)	Office Hours:	1:00-2:30 PM Tuesday (or by appointment)
(c)	Location:	Fisher 344D
(d)	Phone:	250-370-3506
(e)	Email:	vlevson@telus.net
(f)	Website:	See D2L website

2. Intended Learning Outcomes

(No changes are to be made to these Intended Learning Outcomes as approved by the Education Council of Camosun College.)

Upon completion of this course the student will be able to:

1. Describe and interpret short-term and long-term Geologic, Oceanic and Atmospheric processes and their interactions.
2. Make hypothesis-based scientific observations, analyze and interpret quantitative data with reference to Geologic, Oceanic and Atmospheric processes.
3. Comment on orbital motion and wave motion and apply standard equations to compute wave velocity.
4. Use simple laboratory equipment to study and measure wave velocity.
5. Utilize standard tide and current tables and software.
6. Interpret relationships among temperature, salinity and density of seawater, and how these properties vary over time.
7. Describe ocean current transport and be able to assess the role of currents in global heat transfer.
8. Describe relationships among surface ocean currents and atmospheric circulation.
9. Analyze grain size of sediment samples and interpret current environment and sedimentary environment of deposition from sediment data.
10. Determine salinity of water samples and the relationship of salinity to temperature, density and dissolved gases.
11. Comment on the energy budget of the atmosphere, and its short-term and long-term variability.
12. Comment on the chemical evolution of the atmosphere.
13. Describe coastal processes at the land-sea interface.
14. Relate ocean-floor topography and ocean depth data to processes of sea-floor spreading and the age of ocean basins.

3. Required Materials

(a) Texts: **The Earth System**, 3rd Ed. by **Kump, Kasting and Crane**, Prentice Hall, Pearson Ed.

(b) Other: Calculator, Computer with spread sheet program

4. Course Content and Schedule

Lectures: (2) 1 hour and 20 minute blocks: Tu / Wed. 3:30PM - 4:50PM, Fisher Bldg, Room 334;
Labs: Thursday 3:30PM - 6:20PM, Fisher Bldg, Room 300

The list that follows represents the intended sequence of topics, but the sequence may be altered in order to discuss events of local or international significance, e.g. rainfall, hurricanes, flooding, landslides, earthquakes, volcanic eruptions, tsunami, as they occur during the course.

1. Global Change, KKC Ch. 1, p. 1 - 20
2. Systems concepts, KKC Ch. 2, p. 21 – 26; Feedback and equilibrium, KKC Ch. 2, p. 26 - 35
3. Electromagnetic radiation and Earth's energy balance, KKC Ch. 3, p. 36 – 56
4. Atmospheric Circulation, KKC Ch. 4, p. 57-83
5. Ocean Circulation: surface currents KKC Ch. 5, p. 84 – 95; circulation of the deep oceans, p. 96-106
6. Cryosphere, KKC Ch. 6, p. 108-121
7. Structure of the solid earth, KKC Ch. 7, p. 122 – 130; Plate Tectonics, KKC Ch. 7, p. 130 – 147

Midterm exam – Feb 28, 2013

8. Biogeochemical Cycles: The short-term carbon cycle KKC Ch. 8, p. 149 – 159; Long-term carbon cycle, KKC Ch. 8, p. 159-167; Carbonate-silicate cycle, p.168-170; P and N cycles, p. 170-173
9. Origin of the Earth, KKC Ch. 10, p. 190-197
10. Long-term Climate, KKC Ch. 12, p. 233-253
11. Pleistocene Glaciation; Milankovitch Cycles KKC Ch. 14, p. 272-294
12. Global Warming, Part 1, Recent and Future Climate, KKC Ch. 15, p.295-320
13. Part 2, Impacts, Adaptation and Mitigation, KKC Ch. 16, p. 321-339

Term Project due Wed April 3, 2013

14. Ozone, KKC Ch. 17, p. 340-360
    The Future; Review

There are 14 broad topics, which will each require about 1 week. We will attempt to cover all the topics thoroughly, as time permits. Bear in mind that the **interrelationships amongst topics are of fundamental importance.** For example, greenhouse gases affect climate and climate affects the carbon cycle.

5. Basis of Student Assessment (Weighting)

(a) **Labs**: 10 labs, each worth 2.5% of the course for a total of **25%**. Labs are done in pairs for help with measurements discussion of concepts and interpretations. Label each lab assignment with your name and your partner's name. Most people learn most in the lab and pull up their course marks by handing in all of the labs. **YOU MUST PASS THE LAB TO PASS THE COURSE**

(b) Field Trips may occur during lab periods so do not arrive late or we may have gone off without you! Two labs will be fieldtrips (scheduling dependent on weather). Also, a one day field trip is tentatively scheduled for **Saturday March 9th** (date may be changed due to weather). Marks for field trips will be based on a field trip quiz that will be held the week after the 1 day trip. The one day trip is worth **5%** and field trips held in lab periods will be worth 2.5% each (as are regular lab exercises).

(c) **Exams**: the midterm exam will be in week 8 during lab period (February 28), and will be worth **20%**; the Final Exam is worth **35%**. **YOU MUST PASS THE FINAL TO PASS THE COURSE**

(d) **Term Project on an Earth System topic**: as a research paper, experiment or field observations and report (or other approved activity) worth **15%**

Final exam at the end of the course will cover **all** course & lab material.

You must have a passing grade in the lab portion of the course to be able to write the final exam.

Don't make travel arrangements for the final exam period. Only medical excuses will be allowed.

6. Grading System

Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1
0-49	F	Minimum level has not been achieved.	0

Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy E-1.5 at **camosun.ca** for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	*Incomplete*: A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	*In progress*: A temporary grade assigned for courses that, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. *(For these courses a final grade will be assigned to either the 3rd course attempt or at the point of course completion.)*
CW	*Compulsory Withdrawal:* A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.

7. Recommended Materials or Services to Assist Students to Succeed Throughout the Course

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning.
This information is available in the College calendar, at Student Services, or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**.
It is the student's responsibility to become familiar with the content of this policy.
The policy is available in each School Administration Office, at Student Services,
and the College web site in the Policy Section.