



CAMOSUN COLLEGE
School of Arts & Science
Department of Chemistry and Geoscience

**GEOS-110 Earth-Ocean-Atmosphere System
Fall 2019 Course Outline**

The Course Description is online @ <http://camosun.ca/learn/calendar/current/web/geos.html>

Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

1. Instructor Information

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|------------------------|--------------------------------------------------------------|
| a. Instructor | Dr. Leanne Pyle |
| b. Office hours | Monday & Tuesday 1:30-2:20, or e-mail to make an appointment |
| c. Location | F344D |
| d. Phone | 250-370-3506 |
| e. E-mail | PyleL@camosun.bc.ca |
| f. Website | D2L |

2. Intended Learning Outcomes

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. Materials

- a. Recommended Text: **The Earth System**, 3rd Ed. by Kump, Kasting and Crane, Prentice Hall, Pearson Ed.
- b. Calculator, Computer with spread sheet program

4. Course Content and Schedule

- a. Lectures: **Monday 3:30PM - 4:50PM, F310** and **Thursday 10:00AM to 11:20 AM in F202**
- b. Labs: **Tuesday 2:30PM - 5:30PM, Fisher Building, Room 300**
- c. Lab attendance is mandatory, you must pass the lab to pass the course. Labs are due at the beginning of the following lab period. There are no make-up labs. Late labs get half marks for 1 week late and zero after that. Labs are done as teams for help with measurements, discussion of concepts and interpretations. Write your partners' names on each assignment. Labs often pull up your course mark.
- d. Two labs will be based on field trips. This integrates your course learning with field observations and gives you practice relating the theory and terminology to real world observations and processes. Signed waivers are required to participate. An assignment done on-site during the field trip will be worth equal credit of one lab.
- e. The schedule on the following page represents the intended sequence of topics, which may be altered in order to discuss events of local or international significance, e.g. rainfall, hurricanes, flooding, landslides, earthquakes, volcanic eruptions, tsunamis, as they occur during the course.

5. Basis of Student Assessment (Weighting)

- a. Lab and field trip exercises = 25% of the course mark (10 lab assignments worth 2.5% each).
- b. Midterm Exam = 20%
- c. Term Project and Discussion Presentation = 20%
- d. Final exam, cumulative, as scheduled during final exam period = 35%. Final exam schedules are set by the College and posted on Camlink. You must have a passing grade in the lab portion of the course to be able to write the Final Exam.

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		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 at <http://camosun.ca/about/policies/index.html> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> 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	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> 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 to Assist Students to Succeed Throughout the Course

(Use texts, lab manual and course website links weekly)

8. College Supports, Services and Policies

Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines

GEOS-110 Earth-Ocean-Atmosphere System Schedule

Date	Lecture Topic	Text Chapter(s)	Lab Topic
Sept. 3			Introduction in Lab
Sept. 5	Global Change and Earth Systems	Chapters 1, 2	
Sept. 9	Earth's Energy Balance	Chapter 3	
Sept. 9			Field Trip 1
Sept. 12	Geosphere and Plate Tectonics	Chapter 7	
Sept. 16	Geosphere and Plate Tectonics	Chapter 7	
Sept. 17			Lab 1
Sept. 19	Atmospheric System	Chapter 4	
Sept. 23	Atmospheric System	Chapter 4	
Sept. 24			Lab 2
Sept. 26	Origin of Life and Early Atmospheres	Chapters 10, 11	
Sept. 30	Origin of Life and Early Atmospheres	Chapters 10, 11	
Oct. 1			Lab 3
Oct. 3	Midterm		
Oct. 7	Ocean System	Chapter 5	
Oct. 8			Lab 4
Oct. 10	Ocean System	Chapter 5	
Oct. 15			Lab 5
Oct. 17	Biogeochemical Cycles	Chapter 8	
Oct. 21	Biogeochemical Cycles	Chapter 8	
Oct. 22			Lab 6
Oct. 24	Biosphere and Biodiversity	Chapters 9, 13	
Oct. 28	Biosphere and Biodiversity	Chapters 9, 13	
Oct. 29			Lab 7
Oct. 31	Biodiversity Case Studies	Chapters 9, 13	
Nov. 4	The Climate Record	Chapter 12	
Nov. 5			Lab 8
Nov. 7	Cryosphere and Pleistocene Glaciations	Chapter 14	
Nov. 12			Field Trip 2
Nov. 14	Cryosphere and Pleistocene Glaciations	Chapter 14	
Nov. 18	Holocene Climate Change	Chapter 15	
Nov. 19			Term Presentations
Nov. 21	Global Warming	Chapter 16	
Nov. 25	Global Warming	Chapter 16	
Nov. 26			Term Presentations
Nov. 28	Global Warming and Climate Models	Chapter 6	
Dec. 2	Case Study Discussions		
Dec. 3	Case Study Discussions		
Dec. 5	Review		

Term Project Details: Annotated Bibliography (Worth 20%)

The goals of this writing and presentation project are to:

- Hone your research and effective scientific writing skills;
- Apply appropriate referencing of main points by using citations and creating a list of references;
- Explain scientific concepts and evidence-based assessment of a research topic;
- Explore your topic's implications to global Earth Systems (e.g., climate change) issues;
- Synthesize and communicate your topic in a five-minute presentation in our classroom Conference session.

Annotated Bibliography Assignment Description (15%)

1. Choose an Earth Systems topic that is of interest to you. It could be: a) an issue on Earth currently such as an aspect of climate change or biodiversity, or b) something from the geological record such as a mass extinction event, ice ages, ice core records, ocean circulation, carbon cycle, or c) a technical or engineering solution for current issues such as ocean acidification or thermohaline circulation in changing oceans.
2. Create a title for your project and send the topic idea to your instructor for approval by early October. You want to pick a specific topic rather than "climate change" which is much too broad.
3. Research your topic and find 5 references that explain the issue. There are excellent resources available at <http://camosun.ca/services/writing-centre/>. A proper reference should be a scholarly source, review what this means (not a website, not the encyclopedia and not Wikipedia!).
4. Prepare the Annotated bibliography with a total word count not to exceed 1250 words (about 250 words per annotation). See <http://camosun.ca.libguides.com/c.php?g=92338&p=597139> for more assistance. An annotated bibliography lists each reference you have researched for your topic in a consistent style (we will use APA), and underneath provides a summary of the key arguments presented in the reference (article or book chapter) and evaluate the importance of the evidence provided. In your introductory statement, you may also indicate the methods the authors used. At this introductory level, I do not expect you to evaluate the qualifications of the authors, nor go into detail how the works supports your research (which you would do if you were going to the next level to put your annotations together as a research essay).
5. See <http://camosun.ca.libguides.com/c.php?g=92416&p=1138937> for more assistance about APA style, <http://camosun.ca.libguides.com/apa>, and the APA Help Guide in our D2L Readings Folder. APA format includes the following guidelines:
 - The text and the reference list should be double-spaced.
 - Numbering starts on the title page, at the top right of the page.
 - Reference list entries must have a hanging indent.
 - 2.54 cm margins all around (top, bottom, left, and right) on each page.
 - Use Times Roman font, or a similar serif font.
 - Each paragraph should be indented.

Five-minute Presentation (5%)

- Prepare a PowerPoint presentation that consists of about 5 slides (Introduction, key findings, Conclusion).
- Include images from your references and include citations.