



## COURSE OUTLINE

The course description will be online @ <http://camosun.ca/learn/calendar/current/web/geos.html>

### GEOS 100 Physical Geology

- (4 credits) F, W (3,3,0,0)

The origin, composition, age, and processes of Earth are introduced. We study mineral and rock composition, and properties, rock-forming processes, geologic structures, earthquakes, and the plate tectonic model. We apply this knowledge to the geology of BC, Canada and current events. A weekend field trip is optional. Previous study of chemistry is an asset. (T)

Prerequisite(s): English 12 **or** assessment.

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. Tark Hamilton – Theory/Lecture and Dr. Vic Levson – Lab & Field Trips		
(b)	Office Hours:	Mon & Thur: 2:30-3:20, Wed & Thur: 9:30-10:20; Fri 11:30-12:20		
(c)	Location:	Y200		
(d)	Phone:	250-370-3331	Alternative Phone:	
(e)	Email:	<a href="mailto:thamilton@camosun.bc.ca">thamilton@camosun.bc.ca</a> read: Tuesday through Friday 1:20 PM		
(f)	Website:	<a href="https://faculty.camosun.ca/tarkhamilton/">https://faculty.camosun.ca/tarkhamilton/</a> (under construction)		

### 2. Intended Learning Outcomes

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

1. Analyze minerals for common physical properties.
2. Identify common rock-forming minerals on the basis of their properties.
3. Infer how samples of some rocks have formed.
4. Infer the relationship of rock-forming processes to plate tectonics.
5. Describe and interpret textural features of rocks.
6. Describe compositional features of rocks.
7. Classify common rocks based on texture and composition.
8. Apply techniques to determine the chronological order of events in Earth's history.
9. Calculate absolute ages of Earth materials and events.
10. Identify common geologic structures and use symbols to represent such structures on maps.
11. Identify, describe and interpret geological structures in three dimensions.
12. Determine the relationship of geological structures and plate tectonic boundaries.
13. Determine the location of an earthquake from seismic data.
14. Use seismograms to infer relative earth movements on faults.
15. Relate the nature and distribution of major earth features such as mountains, volcanoes and earthquakes to plate tectonics.

**3. Required Texts & Materials** ([Do Not Use Course Smart or other on line publications for lab manuals as the graphics are too poor and there is not room on lab benches for computers in addition to specimens and maps](#))

- a. 4<sup>th</sup> Canadian Edition **Earth: An Introduction to Physical Geology**, E.J. Tarbuck, F.K. Lutgens, C.J. Tsujita & S. R. Hickock 4th ed. Prentice Hall 2014. (Note: this has

Canadian content and access to on-line exercises. All of my test questions are based on this text. The 1<sup>st</sup> Canadian edition without Hickock is more complete & also OK.)

b. **Laboratory Manual in Physical Geology**, AGI, 10th edition of Busch and Tasa, 2015, Pearsoned

Ensure if you buy a used copy of the lab manual that it contains all of the mineral p.90-98 in Ch.3 and rock tables and nomograms in chapters 5, 6 &7. Also ensure that all templates at the back and figures are still attached including structural models 1-6 and the 3 geo-tools pages one paper and 2 plastic.

*Note that earlier editions of this manual have different exercises, figures and page calls. They are not suitable for doing the labs as too much has changed to be able to answer the intended questions.*

c. Recommended reading of other geology texts, a geological glossary (dictionary), a mineral identification book and web based research, readings, real and virtual field trips.

d. Search online for satellite photos, Definitions, short videos or if available from your new textbook, **Mygeoscience Place Pearsoned. Earth: Animations Library, Log into My Geospace once you register your new text book. Here is a link for tectonics, tsunami, planetary rotation etc.:**

[http://www.pearsoned.ca/highered/mygeoscienceplace/geo\\_ani.html](http://www.pearsoned.ca/highered/mygeoscienceplace/geo_ani.html)

e. Satellite and Space station photos of Earth features, landforms and real-time processes are at: <http://earthobservatory.nasa.gov/IOTD> Weekly additions and archives of space station or satellite digital images of geological events and features around the globe. I put up specific links on the course website and there is lots of archival and searchable material for past geological events: volcanic eruptions, hurricanes, landslides, glaciers, etc.

f. **Supplemental on line text: Physical Geology**, Steven Earle, Thompson River's University, BC Campus Open Ed. September 3, 2015. This is a free online text book with alternate presentations covering most of the topics presented in this course by my lecture power point presentations. Link <http://open.bccampus.ca/find-open-textbooks/?uuid=52166cd1-e380-4e1b-9a6f-d891936e4749>

g. **Other *Hand lens*** (needed in many labs and field trips), protractor, drawing compass, coloured pencils (all needed for labs 4 onward for drawing and colouring).

#### **4. Course Content and Schedule: Instruction 14 weeks: Jan.9 through April.14**

a. **Classroom** 3 hours/week 1:30-2:20: Tue & Wed F206, Thur E344

b. **Lab** F300: 3 hours Wed – 2:20-5:30 PM (With prior approval from Dr. Vic Levson alternate lab Wed afternoon the day after your scheduled lab period 2:30-5:20 but not on scheduled test or quiz days due to limited space)

***(Lab attendance is mandatory, you must pass the lab to pass the course)***

Labs are due at the *beginning* of the following lab the week following their issue. If you *ask in advance* you might be able to attend my other lab exercise but this requires advance permission due to full sections or in case the labs are a week out of phase). There are no make-up labs. Access to F300 is limited, use your lab time efficiently, most labs require 1 hour of reading ***prior to coming to the lab*** and 2-3 hours of homework after the lab on your own to complete the exercises. It is better to turn in partial labs than none at all, as lab points are cumulative! Labs are always due at the start of the following lab period. Later labs get half marks for 1 week late and zero after that.

c. 1 half day weekend field trip is optional and counts as a full lab score. These will be scheduled and announced 2 weeks in advance. These integrate your course learning with field observations and give you practice relating the theory and terminology to real world observations and processes. These and any field trips during lab periods will require your **signed wavers** to participate. One wavier does it for the whole term. Wavers are due back immediately on Jan 10 or 11 if you require a guardian signature.

### Labs, Tests & Quiz Schedule

Lab Week/Date	Experiment	Pre-Lab Reading
1. Jan 10/ <b>11</b>	Field Trip in Lab Period, dress warmly with sturdy shoes, meet at lab F300 promptly	Read Earth: Ch1 1-29 plus Ch 11, 12, 13 252-309 for Lecture
<b>Jan 10/11 PM Lab Period Field Trip: Cattle Point – Harling Point – Finlayson Point &amp; form</b>		
2. Jan 17/ <b>18</b>	Lab 1: Units, Density and Isostasy	<i>AGI Manual</i> 1-38 & Lab Form
3. Jan 24/ <b>25</b>	Lab 2 Plate Tectonics & Magma Generation (& Homework)	39-54 & Lab Form
4. Jan 31/Feb <b>1</b>	Lab 3 Minerals (exercise + 50 minerals)	73-110 & Lab Form
5. Feb 7/ <b>8</b>	Finish Lab 3 p.73-100 & hand in. Lab 4 Rock Cycle (Homework)	111-128 Lab Form
<b>6. Holiday Feb 13 and Reading Break 14-17 No lecture or lab this week 17 Conversations Day</b>		
Make a mineral collection of your own practice identifying what you find on the beach or hikes.		
<b>Saturday or Sunday field trip to be announced for some time in last 8 weeks of course</b>		
7. Feb 21/ <b>22</b>	<b>Min Quiz</b> 1 <sup>st</sup> 1.5 hours & Lab 5 Igneous Rocks (do as Homework) 129-142 & Form	Lab 4 due at beginning of lab period Feb 21/ <b>22</b>
<b>Theory Test 1 Thursday Feb 23 in Lecture period, don't be late,</b>		
8. Feb28/ <b>Mar 1</b>	finish & hand in Lab 5 Igneous Rocks 129-142 & Lab Form, Start Lab 6 Seds	
9. Mar 7/ <b>8</b>	Lab 6 Sediments & Sedi Rocks complete and hand in.	153-170 & Lab Form
10. Mar 14/ <b>15</b>	Lab 7 Metamorphic Rocks & Tectonic settings	187-198 & Lab Form
11. Mar 21/ <b>22</b>	Hand in Meta, & Time Lab 8 Finish as Home Work	207-216 & Lab Form
12. Mar 28/ <b>29</b>	<b>Theory Test 2 in 1<sup>st</sup> hour</b> & Lab 10 Structures	259-272 & Lab Form
13. Apr 4/ <b>5</b>	Complete & Hand in Lab 10 & Lab 16 Earthquakes	391-396 & Lab Form
14. Apr 11/ <b>12</b>	<b>Rock Quiz</b> in 1 <sup>st</sup> 1.5 hour & complete Lab 16, Earthquakes	
<b>Good Friday April 14-Easter Monday April 17 College Closed</b>		
Final Exam Period as Scheduled on Camlink Feb. 24: Exams April 18-22 and 24-26		
<b>Weekend Field Trips: TBA by Vic Levson. Depart Camosun staff parking lot by the Wilna Thomas Building at scheduled 2 weeks in advance. Transport via Camosun Bus and driver. Student Drivers and other Car Rides are arranged by sign up in lecture 1 week in advance.</b>		
<ul style="list-style-type: none"> <li>•Theory exams as above in Weeks 6 in Lecture and 12 during the 1<sup>st</sup> hour of the lab followed by a lab exercise</li> <li>• Mineral and Rock Practical Identification Quizzes in 1<sup>st</sup> part of lab weeks 7 &amp; 14 (no late starts)</li> <li>•Final exam at the end of the course is cumulative and will cover <b>all</b> course &amp; lab material.</li> </ul>		
<b>Don't</b> make travel arrangements for the final exam period April 18-26. The final exam schedule will be posted Feb 24 on Camlink. Only medical excuses will be allowed for missed finals.		
<ul style="list-style-type: none"> <li>•You must pass both the lecture portion and the lab portion in order to pass the course</li> <li>•At least a passing grade on lab marks must be achieved in order to write the final exam.</li> <li>•Students are expected to come to lab on time – late arrivals will miss tests, quizzes or field trips as these begin promptly at the start of lab period. Prelab readings and assignments in AGI manual are due as you walk in the lab door. Without them you cannot do the lab. There is not time to read ~20 pages and to do the lab in the lab period.</li> <li>•All lab reports must be stapled with your section number or lab day and time and your partner's name. All lab reports are joint projects of 2 people, all labs require partners for concepts, measurements, calculations and interpretations.</li> </ul>		

## 5. Basis of Student Assessment (Weighting)

(This section should be directly linked to the Intended Learning Outcomes.)

- (a) Lab exercises** (due in lab generally at the beginning of the following lab period or as scheduled above Labs, 2, 3 and 10 count double as they are longer 2 week labs. Labs are due at the beginning of the following lab period. There will not be time to work on old labs as there will always be new work assigned. **You must attend and pass the lab to pass this course.** The lab and field trips are where the scientific inquiry occurs.
- (b) 2 Lab quizzes during 1st hour of lab period along with regular lab assignments as scheduled above ~Week 7 (5%) covering: (mineral physical properties, formulas & identification), week 14 (5%) (covering rock identification and origin).** Labs and lab tests combine to make **25%** of course mark. Lab marks are relative to your peers and the overall point total. Most people's lab marks pull up their course mark. This is where you learn by doing and earn your grade.
- (c) Midterm exams covering theory in weeks 6 (15%) and 12 (25%) (no late starts!)** **Written exams** cover lectures through the week prior to test. **You may bring in a 1 page double sided study sheet for each exam and a calculator.**
- (d) Weekly pop quizzes on assigned readings, new geological vocabulary terms and prior lecture notes may occur at beginning of each lab period or during Tuesday lecture class.**
- (e) Final exam cumulative as scheduled between April 18th and 26th counts 35%.**
- (f) I have a 1 test forgiveness policy for those who improve their test scores as the course proceeds. For example, if you do better on the final exam than a prior exam, I will replace the preceding lower mark and its proportion with the mark from your 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	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](http://camosun.ca) 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, 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. <i>(For these courses a final grade will be assigned to either the 3<sup>rd</sup> course attempt or at the point of course completion.)</i>
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 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](http://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.

No eating or drinking allowed in laboratories or while in F300 as this room is also used as a chemistry lab.