

**APPLIED SCIENCE & MANAGEMENT DIVISION**

**ENVS 100**

**Introduction to Environmental Science I**

**3 credits**

**Fall, 2020**

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## **COURSE OUTLINE**

**ENVS 100**

**INTRODUCTION TO ENVIRONMENTAL SCIENCE I**

**3 CREDITS**

PREPARED BY: Scott Gilbert, Instructor

DATE: August 20, 2020

APPROVED BY: Joel Cubley, Chair, School of Science

DATE: August 20, 2020

APPROVED BY SENATE: Click or tap to enter a date

RENEWED BY SENATE: Click or tap to enter a date



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## INTRODUCTION TO ENVIRONMENTAL SCIENCE I

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**INSTRUCTOR:** Scott Gilbert, B.Sc., PhD  
Chemistry lab instructor: TBA

**OFFICE HOURS:** Tu / Th 9:30-10:30 via  
Zoom software or by email appointment.

**OFFICE LOCATION:** A2515

**CLASSROOM: Lecture:** via Zoom

**Lab:** T1090 (Earth Sciences lab)

**E-MAIL:** [sgilbert@yukonu.ca](mailto:sgilbert@yukonu.ca)

**TIME: Lecture:** Mon /Wed 1:00 – 2:30

**Lab:** Thurs 2:30-5:30

**TELEPHONE:** 867-668-8776

**DATES:** Sept. 2 – Dec. 7, 2020

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### COURSE DESCRIPTION

Environmental Science 100 is specifically designed for students who are not pursuing a science program but who wish to learn more about the physical and biological processes that shape our environment. Our planet, and its living and non-living parts, makes up the biosphere, which itself is a complex web of interactions. We investigate these interrelationships by studying the underlying processes in terms of their biology and chemistry.

The course has two goals. First to explain some of the basic concepts in ecology and chemistry and secondly to show how these concepts can help understand four or five of the critical problems facing our world: the size and growth rate of the world's population, atmospheric problems (global warming, thinning of the ozone layer and acid precipitation) and sustainability of the world's agricultural and forestry industry.

### PREREQUISITES

Admission to an academic program within the School of Liberal Arts or School of Science.

### RELATED COURSE REQUIREMENTS

Lectures during the Fall 2020 term will be held online using Zoom software so students will require a suitable computer with a stable internet connection. A headset with microphone

is also recommended.

### **EQUIVALENCY OR TRANSFERABILITY**

UBC	Geog (3)	SFU	BISC 1xx (3)
UAF	Nsci Elec (n) (3)	UAS	Physical Geog Elec (3)
UR	Geog 100L (3) or Esci 200L (Educ. Students)		
UNBC	Envs 1xx (3) or with ENVS 101 = Envs 100 (3) & Envs 1xx (3)		
UVIC	Es 100L (1.5)		

See <https://bctransferguide.ca/> for an up to date list of transfers within BC. Further information and assistance with transfers may be available from the School of Science.

### **LEARNING OUTCOMES**

Students that successfully complete this course will be able to:

- Describe the basic processes and interrelationships that govern our biosphere.
- Be able to research environmental topics and prepare verbal and written arguments.
- Outline the range of environmental problems confronting the world and identify potential solutions at a variety of levels (as individuals, locally and globally.)

### **COURSE FORMAT**

**Lectures:** Three hours per week (2 classes of 1.5 hours). In response to the 2020 SARS Cov-2 pandemic our lectures will be delivered online using Zoom. Students are encouraged to attend lectures during the scheduled lecture time slot (i.e. synchronously) so they can ask questions and participate in class discussions. Efforts will be made to record and post the Zoom lectures online but students should participate in each class rather than relying on the video archive.

**Labs:** Three hours per week face to face with physical distancing and adjusted class size in effect. There will be a total of seven or eight activities during the term.

### **ASSESSMENTS:**

#### **Attendance & Participation**

Students are expected to attend both lectures and the scheduled activities (including field activities). Several of the lab exercises involve collecting data or making observations and this would make it difficult or impossible for students who miss the lab to complete the lab assignment. There is a strong correlation between regular attendance and academic

performance.

### **Assignments**

There will be several short take-home assignments and the field/lab activities involve written assignments. Students must pass the field/lab portion of the course to receive a passing grade for the overall course. A book review exercise will be assigned early in the term.

### **Tests**

Rather than a single mid-term examination we will have two shorter quizzes. The final exam is scheduled for Monday, Dec. 14 from 1:00- 4:00 pm; it will be comprehensive and cover all topics taken up during the term. If changes due to the SARS Cov-2 pandemic require a switch to online rather than face to face testing for the midterm or final exams then marks will be re-distributed according to *Plan B* in the table below.

### **EVALUATION:**

		<i>Plan B</i>
Book review assignment	10%	15%
Take home quiz / questions	5%	10%
Lab exercises	25%	35%
Midterm exams (2 @15% each)	30%	25%
Distance Learning Journal	5%	5%
Final Exam	25%	10%
Total	100%	100%

### **REQUIRED TEXTBOOKS AND MATERIAL**

Freedman, Bill 2018. *Environmental Science: A Canadian Perspective*. 6th Edition The text is available as a free download in various formats under a Creative Commons licence. See: <https://digitaleditions.library.dal.ca/environmentalscience/> A course manual will be distributed during the first lab session and additional readings will be available on the course web site.

### **ACADEMIC AND STUDENT CONDUCT**

Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted on the Student Services/ Admissions &

Registration web page.

## PLAGIARISM

Plagiarism is a serious academic offence. Plagiarism occurs when a student submits work for credit that includes the words, ideas, or data of others, without citing the source from which the material is taken. Plagiarism can be the deliberate use of a whole piece of work, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Students may use sources which are public domain or licensed under Creative Commons; however, academic documentation standards must still be followed. Except with explicit permission of the instructor, resubmitting work which has previously received credit is also considered plagiarism. Students who plagiarize material for assignments will receive a mark of zero (F) on the assignment and may fail the course. Plagiarism may also result in dismissal from a program of study or the University.

## YUKON FIRST NATIONS CORE COMPETENCY

Yukon University recognizes that a greater understanding and awareness of Yukon First Nations history, culture and journey towards self-determination will help to build positive relationships among all Yukon citizens. As a result, to graduate from ANY Yukon University program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see [www.yukonu.ca/yfnccr](http://www.yukonu.ca/yfnccr).

## ACADEMIC ACCOMMODATION

Reasonable accommodations are available for students requiring an academic accommodation to fully participate in this class. These accommodations are available for students with a documented disability, chronic condition or any other grounds specified in section 8.0 of the Yukon University Academic Regulations (available on the Yukon University website). It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, they should contact the Learning Assistance Centre (LAC): [lac@yukonu.ca](mailto:lac@yukonu.ca).

## TOPIC OUTLINE\*

Date	Topic	Readings
Sept. 2	Introduction: environmental science, ecology, sustainable development, ecological footprint, I=PAT, worldviews.	Chapter 1

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Sept 7	<b>Labour Day holiday</b>	
Sept. 9	Scientific method and hypothesis testing. Succession	Chapter 2. Dearden & Mitchell 2016 Chapter 3 on Succession
Sept. 14	Physical world: hydrosphere & atmosphere. Introduction to key ecological concepts	Chapter 4
Sept. 16+21	Energy flow through ecosystems: ecosystem structure, photosynthesis, consumers, decomposers. Nutrient flows.	Chapter 4 cont'd + pp. 78-81,
Sept. 23-28	Questions of abundance: Animal populations – density, mortality and birth rates. Human populations – historical view of Malthus	pp. 15-18, 39-52, 120-
Sept 30 + Oct. 5	Human populations - population growth and questions of sustainability.	Chapter 2, pp 39-55
Oct. 7	Chemistry: What is chemistry? Basic def'ns – matter and its physical and chemical properties, elements and compounds, mixtures. Simple model of atomic structure – nucleus, protons, neutrons, electrons, atomic number, periodic table, isotopes,	
Oct. 12	<b>Thanksgiving holiday -</b>	
Oct. 14	Chemistry: orbitals and electron configuration, ions, octet rule	
Oct 19	Chemistry: Balancing chemical formulae, law of conservation of mass, molecular mass, photosynthesis eq'n, mole, Avogadro's #r	
Oct. 21	Chemistry: Acid base reactions, proton donors and proton acceptors, pH, scientific notation, titration equivalence point, indicators, buffers	pp. 450-452
Oct 26	Intro to atmospheric chemistry problems – problems related to scale – local air pollution, global warming vs global climate change, greenhouse gases, radiatively active gases,	pp. 85-86 (carbon cycle), Chapter 17
Oct 28	Intro to air pollution – sources and species, gases and particulates, black carbon, LRTAP, primary and secondary pollutants, fugitive emissions, photochemical smog, ozone as a pollutant in the troposphere, loss of ozone in the stratosphere, Montreal Protocol	Chapter 16
Nov. 2	Case studies – Project Drawdown, policy choices, double dividends,	pp 419-422
Nov. 4	Last chem lecture	
Nov. 9	Biological impacts of acid precipitation	pp 471-485
Nov 11	<b>Remembrance Day holiday</b>	
Nov. 16	Agriculture: historical survey of trends. Impacts of agriculture: nutrient cycles, deforestation, energy consumption	Chapter 24

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Nov 18	Agriculture continued	Chapter 24
Nov. 23	Agriculture continued	Chapter 24
Nov. 25	Survey of forestry practices - Carbon budgets and agricultural and forestry practices	Chapter 23
Nov. 30	Pesticides in agriculture and forestry: What are they? Why do we use them? What are the disadvantages?	Chapter 22
Dec. 2	Alternatives to pesticides - Integrated Pest Management (IPM), bio control, changes in land culture practices	
Dec. 7	Contaminants in northern ecosystems	
Dec. 8 (Tues)	Finish contaminants + course summary. [Extra lecture on a Tuesday to make up for Missing Thanksgiving Monday.]	

\* Readings based on your E-text: Freedman 2018 - *Environmental Science: A Canadian Perspective*. 6th Ed



## ENVS 100 – Lab Activity Schedule

We will practice physical distancing during these face to face labs and a sign up sheet will be provided in class so we can set up appropriately sized groups. Please read over the background information and directions for each activity before class. Experience shows that students who forget to prepare for the lab ahead of time, by doing the readings, get confused and frustrated. Take the time to prepare so you can get the most out of these activities.

<b>Date</b>	<b>Activity</b>
Sept. 3	Group A McIntyre Creek Vegetation field survey - meet in A2101 Group B - Library Tour at 2:30 & 3:30 - Library Research Assignment due next Friday
Sept. 10	Group A Library Tour at 2:30 & 3:30 - Library Research Assignment due next Friday Group B McIntyre Creek Vegetation field survey - meet in A2101
Sept. 17	Population growth – tutorial
Sept 24	Walking the Boreal Trail - Living with the neighbours: Soapberry bushes as a bear attractant on campus
Oct. 1	
Oct. 8	<b>Quiz I</b>
Oct. 15	
Oct. 22	Chemistry Lab 1 : Group A [ <i>Meet at the Chemistry Lab</i> ]
Oct. 29	Chemistry Lab 1: Group B [ <i>Meet at the Chemistry Lab</i> ]
Nov. 5	Chemistry Lab 2: Group A [ <i>Meet at the Chemistry Lab</i> ]
Nov 12	Chemistry Lab 2 : Group B [ <i>Meet at the Chemistry Lab</i> ]
Nov. 19	<b>Quiz II</b>
Nov. 26	Tragedy of the Commons workshop
Dec. 3	Karimlam Role Playing exercise