APPLIED SCIENCE & MANAGEMENT DIVISION
School of Science
Winter, 2018

COURSE OUTLINE

ENVS 101

AN INTRODUCTION TO ENVIRONMENTAL SCIENCE II

45 HOURS
3 CREDITS

PREPARED BY: _____ DATE: _____
Scott Gilbert, Instructor
APPROVED BY: _____ DATE: _____
Margaret Dumkee, Dean

APPROVED BY ACADEMIC COUNCIL: _____

RENEWED BY ACADEMIC COUNCIL: _____

APPLIED SCIENCE & MANAGEMENT DIVISION
An Introduction to Environmental Science II
3 Credits
Winter, 2018

AN INTRODUCTION TO ENVIRONMENTAL SCIENCE II

INSTRUCTOR: Scott Gilbert, B.Sc., Ph.D.
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OFFICE HOURS: Mon. & Wed. 11-noon
or by appointment

CLASSROOM: Lecture - A2103
Lab - A2202

TIME: Lecture: Tues & Thurs, 10:30 – Noon
Lab: Monday, 1-4pm

DATES: Jan 4 – April 25, 2018

COURSE DESCRIPTION

Environmental Science 101 is a companion course to ENVS 100; it is designed for students who are not pursuing a science program but who wish to learn more about the effects of human activities on the environment. Students will be able to apply the basic concepts that were presented in ENVS 100 to investigate a variety of environmental problems at both the local and global level.

There will be four major units in this course. Firstly, energy supply options and the relative impacts of these options on the environment. With changing global energy economies, considering options for reducing dependence on certain energy types in order to lessen additions to global climate feedbacks is an increasingly integral challenge to northern lifestyles. Secondly, an introduction to basic concepts of organic chemistry and how contaminants such as DDT and PCB's have impacted northern ecosystems. Thirdly, the importance of the water cycle and groundwater, as well as problems of water pollution from domestic agriculture and industrial sources. And lastly, the practical aspects of environmental protection and an introduction to conservation biology and environmental regulation.

PREREQUISITES

Admission to the School of Science or Liberal Arts.

EQUIVALENCY/TRANSFERABILITY:

SFU SFU GEOG 1SECTNA (3)
UAS Physical Geog Elec (3)
UBC UBC GEOG 1st (3). Not for credit in Science
UNBC Envs 1xx (3) or with ENVS 101 = Envs 100 (3) & Envs 1xx (3)
UR Geog 200 (3)
UVIC UVIC ES 100 lev (1.5)

See the website http://bctransferguide.ca/ for a more complete list of transfers within BC.

LEARNING OUTCOMES

Upon successful completion of the course, students will be able to:

- Use library resources to research and critically assess an environmental topic.
- Write a basic scientific report to describe the outcome of a field or laboratory study using a standard format of Introduction, Methods, Results and Discussion.
- Name simple organic molecules, describe the combustion reaction of alkanes, recognize functional groups and isomers, and understand the structural aspects of PCB's that influence their toxicity.
- Develop a simple cost-benefit analysis of energy-conservation related proposal including a matrix that lists relevant externalities.
- Summarize the range of issues surrounding an environmental question including ethical perspectives, questions of sustainability and underlying biological and chemical factors.

DELIVERY METHODS/FORMAT

Two members of the School of Science will teach the course using a team teaching approach and several steps have been taken to ensure that this multidisciplinary approach is well integrated. Lectures are classroom based and lab period activities vary and will include chemistry lab demonstrations, tutorials on problem sets, guest lectures and class presentations.

COURSE FORMAT

Lectures: Three hours per week (2 classes of 1.5 hours)
Labs: Three hours per week.

COURSE REQUIREMENTS

ASSESSMENTS

Attendance

Students are expected to attend both lectures and the scheduled activities (including field trips). 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 & TESTS

There will be several short class quizzes and take home assignments and some field/lab activities may require written assignments. Rather than a mid-term examination we will have a short test at the end of three of the modules. Students must pass the lab portion of the course if they wish to receive a passing grade for the overall course. The final exam will be scheduled in April and will be comprehensive and cover all topics taken up during the term.

Class participation quizzes	6	
Term paper	15	
Quiz (after 3 modules)	24	
Lab activities	25	Must obtain a minimum of 50% to pass.
Final examination	30	
Total	**100**	

REQUIRED TEXTBOOKS/MATERIALS:
Draper, Dianne & Zimmerman, A. 2017. Our *Environment: A Canadian Perspective* – 5th Ed.

Flowers,P., Theopold, K., Lanley, R. & Robinson, W. 2017 – *Chemistry.* Chapter 20 will be provided on our course website. Also available: https://openstax.org/details/books/chemistry

ACADEMIC AND STUDENT CONDUCT
Information on academic standing and student rights and responsibilities can be found in the current Academic Regulations that are posted as of Dec 2017 under the Admissions web page.

PLAGIARISM
Plagiarism is a serious academic offence. Plagiarism occurs when students present the words of someone else as their own. Plagiarism can be the deliberate use of a whole piece of another person's writing, but more frequently it occurs when students fail to acknowledge and document sources from which they have taken material. Whenever the words, research or ideas of others are directly quoted or paraphrased, they must be documented according to an accepted manuscript style (e.g., APA, CSE, MLA, etc.). Resubmitting a paper 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 College.

YUKON FIRST NATIONS CORE COMPETENCY
Yukon College 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 College program, you will be required to achieve core competency in knowledge of Yukon First Nations. For details, please see www.yukoncollege.yk.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 College Academic Regulations. It is the student's responsibility to seek these accommodations. If a student requires an academic accommodation, he/she should contact the Learning Assistance Centre (LAC) at (867) 668-8785 or lassist@yukoncollege.yk.ca.

ENVS 101 - Lecture Topics & Readings[1] Revised Dec 12/17

Date	Lect	Topic
Jan. 4	1	Term overview. Toxicity and risk assessment **Readings:** pp 576-587
Module I - Organic Chemistry		
Jan. 9	2	Chemistry review: ionic and covalent bonds. Why such diversity of carbon compounds? Introduction to alkanes, alkenes, alkynes, cycloalkanes
Jan. 11	3	Combustion of alkanes & balancing equations **Readings:** pp 602-603
Jan. 16	4	Isomers
Jan. 18	5	Benzene, functional groups
Jan. 23	6	PCB's - structure and toxicity; chiral compounds and stereochemistry
Jan. 25	7	Organochlorines in northern food chains: LRTAP **Readings:** pp 219, 338
Module II - Energy		
Jan 30	8	Overview of systems analysis and feedback loops in natural systems; Governance and energy policy primer **Readings:** pp 75-77
Feb. 1	9	Introduction to externalities and cost-benefit analyses
Feb. 6	10	What is energy? Units of measurement. Overview of renewable and non-renewable energy sources **Readings**: Chap 13
Feb. 8	11	Energy choices: Soft versus hard path; **Readings:** pp 314-315; 609-610
Feb. 13	12	Yukon Wind Energy – History and Future Prospects
Feb. 15	13	Nuclear Energy
Feb. 20 -22		Reading Week - Feb 19-23 includes Friday holiday for Heritage Day on Feb 23
Feb 27	14	Hydraulic Fracturing – What's the Fracking Problem?
Mar. 1	15	Carbon capture and sequestration, geoengineering **Readings:** pp 464-465
Module III – Water		
March 6	16	Chemical properties of water Chapter 1[2] in *Northern Waters*, **Text** Chapter 9

[1] Readings are from the course text, Draper & Zimmerman 2017 - Our Environment: A Canadian Perspective – 5th Ed

		Module III – Water (continued)
March 8	17	Water pollution – Chapter 7 in *Northern Waters* **Readings:** pp 596; 604-608
March 13	18	Groundwater resources and threats – Guest Lecture: Yukon Water Resources
March 15	19	Surface water resources and eutrophication **Readings:** Chapter 9, p. 272
March 20	20	Eutrophication (continued); Video: *Save My Lake*
Module IV - Environmental Regulation		
March 22	21	Sustainability: do we need more regulations? **Readings:** Chapter 18
Mar 27	22	Tools to encourage compliance with environmental regulations
March 29	23	Tools … continued;
April 3	24	Intro to Ecological Economics
April 5	25	Island biogeography and preserving biodiversity **Readings:** Chapter 7
April 10	26	Final Summary Lecture

Schedule of Lab Activities

Mondays	**Topic**
Jan. 8	Heat Loss of Winter Footwear Energy + Organic Chemistry Tutorial I
Jan. 15	Organic Chemistry Tutorial II
Jan. 22	Organic Chemistry Tutorial III + Solubility demonstration in Chemistry Lab
Jan 29	*Quiz: Organic Chemistry* - 60 minutes - Chemical Fact Sheet due today – Intro to cost-benefit calculation exercise
Feb. 5	Arsenic trioxide in Yellowknife; Video: *Shadow of a Giant*
Feb. 12	Energy conservation tutorial // Finalize term paper topic – Library support available
Feb 19	Reading Week Break
Feb. 26	Group Presentations on Yukon Energy Supply Options
March 5	*Quiz: Energy* - 45 minutes // Class presentations on term paper progress
March 12	Field trip Water Quality Lab (tentative)
March 19	Water lab – quantitative exercise TBA
March 26	*Quiz: Water* (45 minutes)
April 2	Easter Monday holiday – no class
April 11 (Wed)	Make up class for Easter Monday – Island biogeography workshop

2 Readings from *Northern Waters: A Guide to Designing and Conducting Water Quality Monitoring in Northern Canada*. 2005. EMAN-North